Appendix D

NATURAL PROGRESSION

URBAN EDGE ENVIRONMENTAL CONSULTING

Habitats Regulations Assessment for the Fareham Borough Local Plan 2037

Screening and Appropriate Assessment Report for the Publication Plan

September 2020

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NATURAL PROGRESSION

Habitats Regulations Assessment for the Fareham Borough Local Plan 2037

Screening and Appropriate Assessment Report for the Publication Plan

Client:	Fareham Borough Council	
Report No.:	UE0192 HRA- Fareham Publication Plan_3_200921	
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2	Final	16 September 2020
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Contents

List of Tables and Figures

Abbreviations

APIS	Air Pollution Information System
BG	(Dark-bellied) Brent goose
BOD	Biological oxygen demand
HRA	Habitat Regulations Assessment
IUCN	International Union for Conservation of Nature
IWMS	Integrated Water Management Strategy
JNCC	Joint Nature Conservancy Committee
N	Nitrogen
NO_2	Nitrogen dioxide
NO_x	Nitrogen oxides
NPPF	National Planning Policy Framework
P	Phosphorous
PUSH	Partnership for Urban South Hampshire
RoC	Review of Consents
SA	Sustainability Appraisal
SAC	Special Area of Conservation
SRMP	Solent Recreation Mitigation Partnership
SEA	Strategic Environmental Assessment
SPA	Special Protection Area
SSSI	Site of Special Scientific Interest
WeBS	Wetland Bird Survey
WFD	Water Framework Directive
WRMP	Water Resource Management Plan
WTW	Wastewater Treatment Works

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0 Executive Summary

0.1 Introduction

0.1.1 Fareham Borough Council is preparing a Local Plan to guide strategic and site-specific development across the Borough for the period 2021 – 2037. As an integral part of this process, the Council has undertaken a Habitats Regulations Assessment. A related Sustainability Appraisal has also been prepared and is reported separately.

0.1.2 Habitats Regulations Assessment (HRA) is a requirement of the Conservation of Habitats and Species Regulations 2017 (as amended; commonly referred to as 'the Habitats Regulations'), and must be applied to any plan or project not directly connected with or necessary to the management of a European site, if it is likely to have a significant effect on a European site either alone or in combination with other plans or projects.

0.1.3 The HRA incorporates evidence on likely impact pathways and conducts an Appropriate Assessment in view of European site conservation objectives. Where adverse effects are identified, either alone or in combination with other plans and projects, the report considers the mitigation measures incorporated within the Local Plan to determine whether they are capable of preventing adverse effects on ecological integrity. No reliance is placed on mitigation during the screening assessment. Chapter 2 presents information about the overall methodology used for the HRA.

0.2 Scope of the Assessment

0.2.1 Acknowledging that the Local Plan is not directly connected with or necessary to management of the sites for nature conservation, the HRA considers the following European sites for likely significant or adverse effects on integrity:

- Butser Hill Special Area of Conservation (SAC)
- Solent & Isle of Wight Lagoons SAC
- The New Forest SAC
- Portsmouth Harbour Special Protection Area (SPA)
- Solent & Southampton Water SPA
- Chichester & Langstone Harbours Ramsar
- Solent & Southampton Water Ramsar
- River Itchen SAC
- Solent Maritime SAC
- Chichester & Langstone Harbours SPA
- Solent & Dorset Coast SPA
- The New Forest SPA
- Portsmouth Harbour Ramsar
- The New Forest Ramsar

0.2.2 Chapters 3 and 4 present information about the sites, including their qualifying features and conservation objectives.

0.2.3 Emer Bog SAC is located c14.7km north-west of Fareham Borough and is designated for its transition mire and quaking bog habitat. Development in Fareham Borough is unlikely to influence these habitats and the site is not considered further.

0.3 Impact Pathways

0.3.1 The following impact pathways are considered for likely significantly effects on the European sites:

- Atmospheric pollution;
- Coastal squeeze;
- Disturbance;
- Water abstraction;
- Water pollution; and
- Site specific impacts.

0.3.2 Chapter 6 describes the available evidence about these impact pathways in relation to the European sites.

0.4 Summary of Findings

0.4.1 In summary, the assessment of the Fareham Local Plan finds that:

- No likely significant effects were identified in relation to Butser Hill SAC, Emer Bog SAC, Solent and Isle of Wight Lagoons SAC, either alone or in combination with other plans and projects.
- No likely significant effects through atmospheric pollution were identified for Chichester and Langstone Harbours SPA/Ramsar, either alone or in combination with other plans and projects. There will be no adverse effect on the integrity of River Itchen SAC, Solent Maritime SAC, the New Forest SAC/SPA/Ramsar, Portsmouth Harbour SPA/Ramsar, Solent and Dorset Coast SPA or Solent and Southampton Water SPA/Ramsar as a result of atmospheric pollution, either alone or in combination with other plans and projects.
- No likely significant effects through coastal squeeze were identified for Solent Maritime SAC, Portsmouth Harbour SPA/Ramsar, Solent and Dorset Coast SPA or Solent and Southampton Water SPA/Ramsar, either alone or in combination with other plans and projects.
- No likely significant effects through strategic disturbance were identified for River Itchen SAC, Solent Maritime SAC, the New Forest SAC/SPA/Ramsar or Solent and Dorset Coast SPA, either alone or in combination with other plans and projects. There will be no adverse effect on the integrity of Chichester and Langstone Harbours SPA/Ramsar, Portsmouth Harbour SPA/Ramsar or Solent and Southampton Water SPA/Ramsar as a result of strategic disturbance, either alone or in combination with other plans and projects.

- No likely significant effects through water abstraction were identified for River Itchen SAC, Solent Maritime SAC, Chichester and Langstone Harbours SPA/Ramsar, Portsmouth Harbour SPA/Ramsar and Solent and Southampton Water SPA/Ramsar, either alone or in combination with other plans and projects.
- No likely significant effects through water pollution were identified for River Itchen SAC, Chichester and Langstone Harbours SPA/Ramsar, Portsmouth Harbour SPA/Ramsar or Solent and Dorset Coast SPA, either alone or in combination with other plans and projects. There will be no adverse effect on the integrity of Solent Maritime SAC or Solent and Southampton Water SPA/Ramsar as a result of water pollution, either alone or in combination with other plans and projects.
- No likely significant effects through site specific impacts were identified for River Itchen SAC, the New Forest SAC/SPA/Ramsar or Chichester and Langstone Harbours SPA/Ramsar, either alone or in combination with other plans and projects. There will be no adverse effect on the integrity of Solent Maritime SAC, Portsmouth Harbour SPA/Ramsar, Solent and Dorset Coast SPA or Solent and Southampton Water SPA/Ramsar as a result of site specific impacts, either alone or in combination with other plans and projects.

0.5 Conclusions

0.5.1 The Fareham Borough Local Plan can be considered compliant with the Habitats Regulations with regards to: Butser Hill SAC, Emer Bog SAC, Solent and Isle of Wight Lagoons SAC, New Forest SAC/SPA/Ramsar; River Itchen SAC; Solent Maritime SAC; Chichester and Langstone Harbours SPA/Ramsar; Portsmouth Harbour SPA/Ramsar; Solent & Dorset Coast SPA; and Solent & Southampton Water SPA/Ramsar.

0.6 Consultation Arrangements

0.6.1 The HRA Report is being made available for consultation as part of the Publication Plan consultation in autumn 2020 and can be viewed at:

http://www.fareham.gov.uk/planning/farehamlocalplanreview.aspx
Planning Strategy **Fareham Borough Council** **Civic Offices, Civic Way, Fareham, Hampshire PO16 7AZ**

0.6.2 Representations should be sent to:

Planning Strategy **Fareham Borough Council** **Civic Offices, Civic Way, Fareham, Hampshire PO16 7AZ** planningpolicy@fareham.gov.uk

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1 Introduction

1.1 Purpose of this Report

1.1.1 This report has been prepared for Fareham Borough Council (FBC) as part of the Habitats Regulations Assessment (HRA) for the Local Plan 2037. The report accompanies the Publication Local Plan and forms part of the evidence base upon which it is based. A related Sustainability Appraisal has also been prepared and is reported separately.

1.2 The Fareham Borough Local Plan 2037

1.2.1 Currently the development plan for Fareham Borough is comprised of the following documents:

- Local Plan Part 1: Core Strategy (adopted August 2011);
- Local Plan Part 2: Development Sites and Policies (DSP) Plan (adopted June 2015);
- Local Plan Part 3: The Welborne Plan (adopted June 2015); and
- Hampshire Minerals and Waste Plan (adopted October 2013).

1.2.2 The new Local Plan will set the planning strategy for the Borough and address emerging housing and employment needs for a period of 16 years from 20201 up to 2037. The Welborne Plan will not be replaced by the 2037 Plan, but together with the new Local Plan will form the new Development Plan for the Borough. The Publication Plan sets out proposed strategic and development management policies, development allocations and actions to meet the environmental, social and economic challenges facing the Borough. When adopted the Local Plan will provide a strategy for the distribution, scale and form of development and supporting infrastructure, a set of proposals to deliver the strategy, policies against which to assess planning applications, and proposals for monitoring the success of the plan.

1.2.3 A Draft version of the new Local Plan was published for Regulation 18 consultation between 25 October and 8 December 2017. The Draft Plan was accompanied by an earlier version of this HRA report which formed part of the Draft Plan evidence base. In 2018, the Government published changes to the NPPF, which significantly increased the number of homes required in Fareham Borough. The Draft Local Plan which FBC consulted on in 2017 would not meet the new requirement hence triggering the need for a new Local Plan. A Supplement to the Draft Local Plan was therefore published for Regulation 18 consultation between the 13 January and 1 March 2020, setting out a revised Development Strategy to accommodate the additional housing requirement for Fareham Borough. This Supplement to the Draft Plan was not accompanied by an updated HRA report.

1.2.4 In August 2020 the Government announced a new technical consultation[1] proposing further changes to the way housing need is calculated. These changes would reduce the Borough's annual housing requirement. The Publication Plan development strategy assessed in this HRA report takes account of this reduced overall housing need for the plan period.

1.3 Habitats Regulations Assessment

1.3.1 Habitats Regulations Assessment is a requirement of the Conservation of Habitats and Species Regulations 2017 (as amended; 'the Habitats Regulations'), the UK's transposition of *European Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora* ('the Habitats Directive'). HRA must be applied to any plan or project not directly connected with or necessary to the management of a European site, if it is likely to have a significant effect on a European site either alone or in combination with other plans or projects.

1.3.2 European sites provide ecological infrastructure for the protection of rare, endangered or vulnerable natural habitats and species of exceptional importance within the European Union. These sites consist of Special Areas of Conservation (SAC, designated under the Habitats Directive) and Special Protection Areas (SPA, designated under *European Council Directive 2009/147/EC on the conservation of wild birds* ('the Birds Directive')). Additionally the NPPF (MHCLG, 2019) and Circular 06/05 (ODPM, 2005) require that Ramsar sites (UNESCO, 1971) are treated as if they are fully designated European sites for the purposes of considering development proposals that may affect them.

1.3.3 The HRA Report responds to recent case law from the Court of Justice of the European Union (CJEU) and Natural England's position in relation to nutrient neutral development in south Hampshire.

1.4 Scope and Structure of this Document

1.4.1 The document is structured around the following sections:

- Chapter Two: HRA methodology;
- Chapter Three: European sites, qualifying features, conservation objectives, condition status, population trends and threats to site integrity;
- Chapter Four: European site characterisation;
- Chapter Five: The Fareham Borough Local Plan;
- Chapter Six: Identifying impact pathways and screening for likely significant effects;
- Chapter Seven: Appropriate Assessment;
- Chapter Eight: Determining adverse effects on European site integrity; and
- Chapter Nine: Summary and conclusions.

[1] Ministry of Housing, Communities and Local Government (August 2020): *Changes to the current planning system: Consultation on changes to planning policy and regulations.*

2 Methodology

2.1 Good Practice Guidance

2.1.1 Draft guidance on HRA has been defined by DEFRA (2012) and DCLG (2006) with more detailed draft guidance from Natural England (Tyldesley, 2009) and a range of other bodies[2]. More recently *The Habitats Regulations Assessment Handbook* (Tyldesley & Chapman, 2013) was developed to improve earlier methodologies on the basis of recent good practice and case law, and in response to Defra's Habitats and Birds Directives Implementation Review. The requirement for HRA stems from Articles 6(3) and 6(4) of the Habitats Directive, which are represented by four stages within the HRA process as listed in Table 2.1 which illustrates their relationship to stages within the DEFRA (2012) guidance.

2.1.2 The Screening Assessment and Appropriate Assessment for the Local Plan are being undertaken with reference to the *HRA Handbook*, updating the findings of earlier stages of HRA Screening for the Draft Local Plan.

Table 2.1: Stages of HRA in guidance from Tyldesley & Chapman (2013) & DEFRA (2012)

HRA Handbook stage	Equivalent DEFRA stage
Stage 1: Screening for Likely Significant Effects	Stage 1: Screening for likely significant effects
Stage 2: Appropriate Assessment & Integrity Test	Stage 2: Appropriate assessment
Stage 3: Alternative Solutions	Derogations Test 1: Alternative solutions
Stage 4: Imperative Reasons of Overriding Public Interest and Compensatory Measures	Derogations Test 2: Imperative reasons of overriding public interest Derogations Test 3: Compensatory measures

2.1.3 In *The Habitats Regulations Assessment Handbook* (Tyldesley & Chapman, 2013) section F.1.1.2 (Introduction and overview to 'Plan' assessment) it is recognised that the assessment of a plan may not be as precise and detailed as that of a project at application stage. Strategic documents such as a Local Plan also vary in their degree of specificity ranging from very general statements which may cover a wide geographic area to more prescriptive proposals that are scale and location specific.

2.1.4 An HRA must determine whether or not a plan or project will adversely affect the integrity of the European site(s) concerned, in view of the site's conservation objectives. Where adverse effects are anticipated changes must be made to the plan or project. The process is characterised by the precautionary principle, defined as (European Commission, 2000):

[2] For example European Commission (2018) and RSPB (Dodd *et al*, 2007)

"If a preliminary scientific evaluation shows that there are reasonable grounds for concern that a particular activity might lead to damaging effects on the environment, or on human, animal or plant health, which would be inconsistent with the protection normally afforded to these within the European Community, the Precautionary Principle is triggered.

"Decision-makers then have to determine what action to take. They should take account of the potential consequences of taking no action, the uncertainties inherent in the scientific evaluation, and they should consult interested parties on the possible ways of managing the risk. Measures should be proportionate to the level of risk, and to the desired level of protection. They should be provisional in nature pending the availability of more reliable scientific data.

"Action is then undertaken to obtain further information enabling a more objective assessment of the risk. The measures taken to manage the risk should be maintained so long as the scientific information remains inconclusive and the risk unacceptable."

2.2 Screening

2.2.1 *The Handbook* defines a list of 'screening categories' to provide a rigorous and transparent approach to determining which aspects of the plan could potentially result in significant (adverse) effects. These are listed in Table 2.2, where green indicates that the proposal can be screened-out, orange denotes proposals which may have a significant effect in combination and require further analysis, and red specifies proposals likely to have a significant effect. The colour-coded categories provide the means of recording the results of the assessment in such a way that important issues are identified whilst proposals that have no effect are screened out.

2.2.2 All policies and potential new development allocations being proposed for inclusion in the Local Plan were screened for likely significant effects on European sites. Chapter 3 defines which European sites are considered during the assessment, together with their qualifying features and conservation objectives, and Chapter 4 provides baseline information about the qualifying features. The ways in which each European site might be significantly affected by the Local Plan (impact pathways) are described in Chapter 6. Chapter 7, supported by Appendix II, summarises the outputs of the screening assessment, identifying which proposed site allocations and policies are likely to significantly affect a European site and via which impact pathway. The screening assessment has been revised and updated from the Draft Plan stage.

2.2.3 The screening assessment concludes that the majority of proposed policies are unlikely to significantly affect a European site, however, those which propose certain sites for development may do and these form the focus of the assessment.

Table 2.2: Screening categories (Source: Tyldesley & Chapman, 2013)

Cat.	Description
A	General statement of policy / aspiration
B	Policy listing general criteria for testing the acceptability / sustainability of proposals
C	Proposal referred to but not proposed by the plan
D	Environmental protection / site safeguarding policy
E	Policy/proposal steers change in such a way as to protect European sites from adverse effects
F	Policy that cannot lead to development or other change
G	Policy/proposal that could not have any conceivable effect on a European site
H	Policy/proposal the (actual or theoretical) effects of which cannot undermine the conservation objectives (either alone or in combination with other aspects of this or any other plan/project)
I	Policy/proposal with a likely significant effect on a European site alone
J	Policy/proposal with an effect on a site but not likely to be significant alone; check for likely significant effects in combination
K	Policy/proposal not likely to have a significant effect either alone or in combination (after the in combination test)
L	Policy/proposal likely to have a significant effect in combination (after the in combination test)
M	Bespoke area, site or case specific policies or proposals intended to avoid or reduce harmful effects on a European site

2.3 Appropriate Assessment

2.3.1 The purpose of the Appropriate Assessment stage is to further analyse likely significant effects identified during the screening stage, as well as those effects which were uncertain or not well understood and taken forward for assessment in accordance with the precautionary principle. The Appropriate Assessment evaluates the implications of the plan, either alone or in combination with other plans or projects, in light of the conservation objectives of affected European sites.

2.3.2 The Appropriate Assessment stage includes a test of whether the plan proposals will result in adverse effects on site integrity (set out in Chapter 8) which can be defined as (ODPM, 2005):

> *"The integrity of a site is the coherence of its ecological structure and function, across its whole area, that enables it to sustain the habitat, complex of habitats and/or the levels of populations of the species for which it was classified."*

2.3.3 In the 2018 Holohan judgment[3], the CJEU ruled that an Appropriate Assessment must consider the interest features of European sites even where those features may be found outside the strict boundaries of those sites and must also consider other habitat types or species, which are present on the site, but for which that site has not been listed but which are necessary to the conservation of the habitat types and species listed for the protected area. The former matter is

[3] Case C 461/17 Court of Justice of the European Union (2018): Holohan v. An Bord Pleanála.

traditionally captured in Appropriate Assessment in England (and in this HRA) through consideration of the concept of 'functionally linked land' (e.g. land outside the Solent SPA boundaries which supports wintering Brent goose and waders) while the latter is captured where, for example, habitats within a European site that are not themselves designated are nonetheless considered when assessing impacts because of the functional role in enabling the site to meet its conservation objectives (e.g. marginal vegetation in the River Itchen SAC which is used by southern damselfly for egg laying).

2.4 Counteracting Measures

2.4.1 This section draws on Principle C.5 of the *HRA Handbook* (Tyldesley & Chapman, 2013) to identify different types of counteracting measure and describe how they should be considered within the HRA. There is a well-established policy and ethical approach to assessment which recognises a hierarchy of counteracting measures, which prefers avoidance of adverse effects in the first instance, then cancellation, then reduction, and finally compensatory measures where these can be adequately justified. This approach is embedded in guidance (e.g. CIEEM, 2018; DEFRA, 2012), professional standards (BS42020:2013) and the National Planning Policy Framework (para. 175; MHCLG, 2019).

2.4.2 A distinction must be drawn between measures intended to avoid, cancel or reduce adverse effects on European sites (collectively referred to as mitigation measures) and those which are intended to compensate for adverse effects (compensatory measures); the latter must only be considered following application of the Imperative Reasons of Overriding Public Interest test:

- Mitigation: Avoidance measures: intended to stop or prevent effects from occurring, or to eliminate the risk of them occurring. Successful avoidance measures mean there will be no adverse effect, and hence no requirement to assess effects in combination.
- Mitigation: Cancellation measures: intended to completely neutralise adverse effects. In this context a proposal will have a potential effect, but its potentially negative outcomes have been cancelled without residual effect, and there is no requirement to assess effects in combination.
- Mitigation: Reduction measures: intended to diminish an effect either by reducing the scale of the effect, or its likelihood of occurring, or both. Such measures can reduce the severity/likelihood of an effect to the point where it can no longer be regarded as a likely significant effect, but may result in a risk of residual effects. Residual effects need to be considered for their potential to lead to cumulative or in combination effects.
- Compensatory measures: intended to offset the harm to the integrity of a European site that would occur as a result of a plan or project. They are considered only after having established that the harm to the site itself cannot be further reduced by mitigation or alternative solutions, and are the measures required to ensure that the overall coherence of Natura 2000 is protected.

2.4.3 In the 2018 People Over Wind judgment[4], the CJEU ruled that measures intended to avoid or reduce the harmful effects of a plan or project on a European site (i.e. mitigation measures)

[4] Case C 323/17 Court of Justice of the European Union (2018): People Over Wind, Peter Sweetman v Coillte Teoranta.

cannot be taken into account by a competent authority when considering, at the HRA screening stage, whether the plan or project is likely to have a significant effect on a European site. July 2019 updates to Planning Practice Guidance on HRA note that features that are integral to the design or physical characteristics of the project / plan that is being assessed (as opposed to factors that have been introduced to avoid or reduce harm) may be considered at the screening stage. However, this will need to be determined on a case by case basis.

2.4.4 Thus where mitigation measures are incorporated into the plan or project, are effective, reliable, timely, guaranteed and of sufficient duration, they should be taken into account at the integrity test stage (Stage 2). A competent authority can impose additional mitigation measures over and above incorporated mitigation, if necessary, so as to ensure that a plan or project would not adversely affect the integrity of a European site, either alone or in combination with other plans and projects. Additional mitigation measures should also be considered at the integrity test stage.

2.5 In Combination Effects

2.5.1 Other plans and projects being prepared or implemented in the area may have the potential to cause negative effects on European sites. These effects may act in combination with the effects of the Local Plan, possibly leading an insignificant effect to become significant. It is therefore important to consider which other plans and projects could generate similar effects as development within Fareham Borough, at the same European sites, and which may act in-combination.

2.5.2 The plans and projects listed below were identified at the screening stage for consideration during in combination assessment. Table 2.3 summarises the housing requirements set out in the Local Plans of neighbouring authorities.

- Strategic development at Boorley Green, Eastleigh Borough
- Strategic development at West of Waterlooville, Havant Borough
- Strategic development at Tipner and Horsea Island, Portsmouth
- Strategic development at North of Whiteley, Winchester district
- Eastleigh Borough Adopted Local Plan Review 2001-2011 (adopted 2006)
- Eastleigh Borough Draft Local Plan 2011-2036
- Fareham Borough Welborne Plan (adopted 2015)
- Gosport Borough Local Plan 2011 to 2029 (adopted 2015)
- The Portsmouth Plan (adopted 2012)
- Portsmouth City Draft Local Plan 2014-2034
- Winchester District Local Plan Part 1 - Joint Core Strategy (adopted 2013)
- Winchester District Local Plan Part 2 – Development Management and Site Allocations (adopted 2013)
- North Solent Shoreline Management Plan (2010)

- Hampshire Local Transport Plan (2011-2031)
- Joint Hampshire Minerals and Waste Plan (adopted 2013) (includes Portsmouth, Southampton, New Forest National Park and South Downs National Park)

Table 2.3: Housing numbers to be delivered across authorities neighbouring Fareham Borough

Local authority	Plan period and status	Annual housing requirement average	Total housing over plan period
Gosport	2011 to 2029 (adopted 2015)	210	3,060
Eastleigh	2001-2011 (adopted 2006)	561	5,608
Eastleigh	Draft Local Plan 2016-2036	729	14,580
Portsmouth	2010 – 2027 (adopted 2012)	490	8,330
Winchester	2013 - 2031 (adopted 2013)	695	12,500

2.5.3 In combination effects are considered in Chapters 6 and 7.

3 European Sites

3.1 Scope of the Assessment

3.1.1 European sites considered within the scope of this assessment include all those falling partially within or close to Fareham Borough. Additionally, there may be activities occurring as a result of development within the Borough, which could take place outside of the Borough boundaries, possibly affecting European sites further afield. Three types of European site are considered:

- **Special Areas of Conservation (SAC)**: SACs are strictly protected sites designated under the EC Habitats Directive, which is transposed into national law via 'The Conservation of Habitats and Species Regulations 2017'. Article 3 of the Habitats 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 (as amended). The listed habitat types and species are those considered to be most in need of conservation at a European level (excluding birds which are conserved by SPA and Ramsar – see below).
- **Special Protection Areas (SPA)**: In 1979 the European Community adopted the Council Directive on the Conservation of Wild Birds (79/409/EEC), usually referred to as the Birds Directive. The Birds Directive is transposed into national law via the 'Wildlife and Countryside Act 1981' and 'The Conservation of Habitats and Species Regulations 2017'. It provides for the protection, management and control of all species of naturally occurring wild birds in the European territory of Member States. In particular it requires Member States to identify areas to be given special protection for the rare or vulnerable species listed in Annex I (Article 4.1) and for regularly occurring migratory species (Article 4.2) and for the protection of wetlands, especially wetlands of international importance.
- **Ramsar:** Ramsar sites are wetlands of international importance designated under the Ramsar Convention. In the UK, the first Ramsar sites were designated in 1976. Since then, many more have been designated. The initial emphasis was on selecting sites of importance to waterbirds within the UK, and consequently many Ramsar sites are also SPAs classified under the Birds Directive as is the case with the sites which are being considered by this assessment.

3.1.2 Acknowledging that the Local Plan is not directly connected with or necessary to management of the sites for nature conservation, the HRA considers the following European sites for likely significant or adverse effects on integrity; see Figure 3.1:

- Butser Hill SAC
- Solent & Isle of Wight Lagoons SAC
- The New Forest SAC
- Portsmouth Harbour SPA
- River Itchen SAC
- Solent Maritime SAC
- Chichester & Langstone Harbours SPA
- Solent & Dorset Coast SPA

- Solent & Southampton Water SPA
- Chichester & Langstone Harbours Ramsar
- Solent & Southampton Water Ramsar
- The New Forest SPA
- Portsmouth Harbour Ramsar
- The New Forest Ramsar

3.1.3 These European sites have been designated to conserve a wide variety of habitats, along with a suite of species typical to each. Table 3.1 and Table 3.2 set out the qualifying features for SAC and SPA designations. Appendix I details the qualifying species counts for each SPA at the time of citation. Ramsar sites do not have qualifying features, however the justification for the application of the relevant Ramsar criterion to each site is set out in Table 3.3. These European Sites are described further in Chapter 4.

3.1.4 Emer Bog SAC is located c14.7km north-west of Fareham Borough and is designated for its transition mire and quaking bog habitat. Its condition is most vulnerable to local changes in water levels and input of agricultural nutrients from neighbouring land[5]; development in Fareham Borough is unlikely to influence either of these factors, and the site is not considered further.

3.2 Conservation Objectives for SAC and SPA

3.2.1 The Habitats Directive requires that Member States maintain or where appropriate restore habitats and species populations of European importance to favourable conservation status. European site conservation objectives are referred to in the Habitats Regulations and Article 6(3) of the Habitats Directive. They are for use when there is a need to undertake an Appropriate Assessment under the relevant parts of the respective legislation. The conservation objectives are set for each feature (habitat or species) of an SAC/SPA. Where the objectives are met, the site can be said to demonstrate a high degree of integrity and the site itself makes a full contribution to achieving the aims of the Habitats and Birds Directives. The conservation objectives defined by Natural England for the SACs and SPAs included within the scope of this HRA are given in Table 3.4. Natural England has recently published or updated its *Supplementary advice on conserving and restoring site features* for each site[6].

[5] For more information refer to the following hyperlinks:
http://jncc.defra.gov.uk/ProtectedSites/SACselection/n2kforms/UK0030147.pdf
http://publications.naturalengland.org.uk/publication/4900551749795840?category=6528471664689152

[6] Natural England (2019): *European Site Conservation Objectives: Supplementary advice on conserving and restoring site features: The New Forest Special Area of Conservation*. 18 March 2019.
Natural England (2019): *European Site Conservation Objectives: Supplementary advice on conserving and restoring site features: New Forest Special Protection Area*. 19 March 2019.
Natural England (2019): *European Site Conservation Objectives: Supplementary advice on conserving and restoring site features: River Itchen Special Area of Conservation*. 19 March 2019.
Natural England (2018): *Conservation Advice for Marine Protected Areas: Solent Maritime SAC: Supplementary Advice on Conservation Objectives*. 16 March 2018.
Natural England (2019): *Conservation Advice for Marine Protected Areas: Solent and Southampton Water SPA: Supplementary Advice on Conservation Objectives*. 15 March 2019.

Fareham Local Plan

- Special Areas of Conservation
- Special Protection Areas
- Ramsar Sites
- Borough

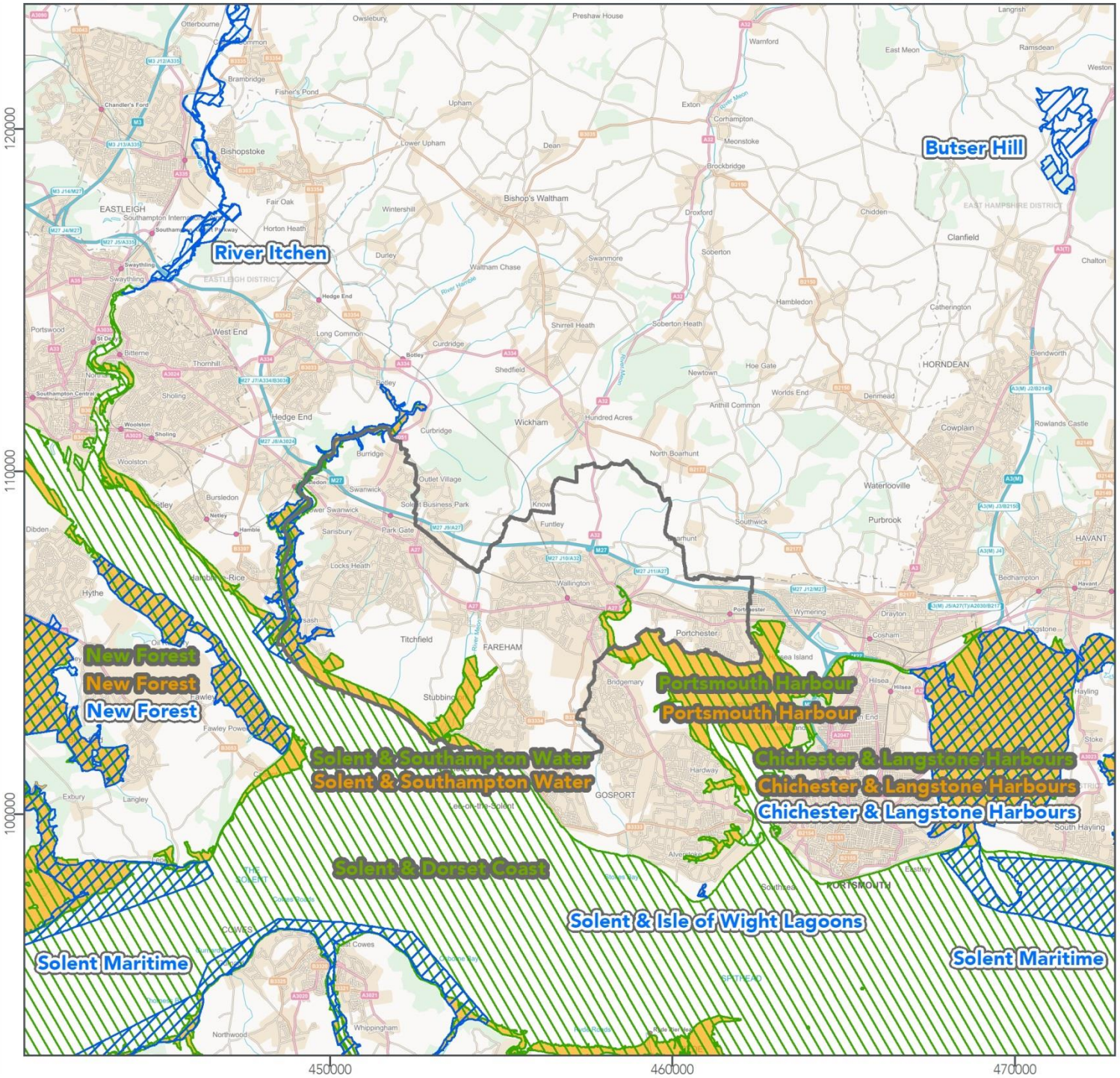

Figure 3.1: European Sites in and around Fareham Borough

0 4 8
Kilometers

N

Scale: 1:165,000 **Created by:** JC
Date: Feb 2020 **Reviewed by:** GC
Drawing number:
UE-0192_HRA_International_Sites_200225

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Table 3.1: SAC Qualifying Features

Site Name	Description	Qualifying Features
Butser Hill SAC	Butser Hill SAC comprises an area of approximately 239 ha on the east Hampshire chalk which forms part of the South Downs. The majority of the site consists of sheep's-fescue - meadow oat-grass (*Festuca ovina - Helictotrichon pratense*) grassland. The site has a varied range of slope gradients and aspects which have a strong influence on the vegetation composition. A particular feature of the site is its lower plant assemblage. It has a rich chalk grassland lichen flora and also supports the distinctive *Scapanietum asperae* or southern hepatic mat association of leafy liverworts and mosses on north-facing chalk slopes. This association is very rare in the UK and Butser Hill supports the largest known example. The site exhibits various transitions between semi-natural dry grassland, chalk heath, mixed scrub and yew *Taxus baccata* woods. The coombes of the south-east flank of Butser Hill support dense yew woodland in association with scrub and chalk grassland. The yew is regenerating into the grassland and shows the classic interaction of these habitats in relation to grazing pressure.	<u>Annex I Habitat</u> - Semi-natural dry grasslands and scrubland facies on calcareous substrates *(Festuco-Brometalia)* - *Taxus baccata* woods of the British Isles*
River Itchen SAC	The River Itchen SAC comprises an area of approximately 309 ha and is a classic chalk river which flows from mid-Hampshire to join with Southampton Water, being mainly spring fed. The river's vegetation is dominated by higher plants and species rich aquatic flora with many typical chalk stream plants present in abundance. The majority of species are present throughout the system. The river is rich in invertebrates, supporting diverse populations of aquatic molluscs and one of a few populations of the native freshwater crayfish remaining in rivers of southern England as well as a population of otters. The river is dominated throughout by aquatic *Ranunculus spp.* The headwaters contain pond watercrowfoot *Ranunculus peltatus*, while two *Ranunculus* species occur further downstream: stream watercrowfoot *R. penicillatus ssp. pseudofluitans*, a species especially characteristic of calcium-rich rivers, and river water-crowfoot *R. fluitans*. The fish fauna of the Itchen are typical of lowland chalk rivers including bullhead *Cottus gobbio* and brook lamprey *Lampetra planeri* as well as Atlantic salmon Salmo salar and a localised population of Atlantic stream crayfish *Austropotamobius*. The river provides good water quality, extensive beds of submerged plants that act as a refuge for the species, and coarse sediments that	<u>Annex I Habitat</u> - Water courses of plain to montane levels with the *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation <u>Annex II Species</u> - Atlantic Salmon *Salmo salar* - Brook Lamprey *Lampetra planeri* - Bullhead *Cottus gobio* - Otter *Lutra lutra* - Southern damselfly *Coenagrion mercuriale* - White-clawed (or Atlantic stream) Crayfish *Austropotamobius pallipes*

Site Name	Description	Qualifying Features
	are vital for spawning and juvenile development. The Itchen valley contains areas of fen, swamp and meadow supporting vegetation with diverse plant communities, some typically species-rich. Water courses including meadow ditches, base-rich runnels and flushes in open areas, small side-channels and parts of the main river support strong populations of southern damselfly *Coenagrion mercu.*	
Solent and Isle of Wight Lagoons SAC	The Solent and Isle of Wight Lagoons SAC covers an area of approximately 36 ha and encompasses a series of coastal lagoons, including percolation, isolated and sluiced lagoons. The site includes eight lagoons in the marshes in the Keyhaven to Lymington area, one lagoon at Farlington Marshes in Langstone Harbour, four lagoons located behind the sea-wall at Bembridge Harbour and one lagoon at Gilkicker, near Gosport. Each lagoon has its own unique conditions with salinities varying from brackish to hypersaline and substrates ranging from soft mud to muddy sand with a high proportion of shingle. These sheltered conditions support a diverse fauna including large populations of three notable species: the nationally rare foxtail stonewort (*Lamprothamnium papulosum*), the nationally rare lagoon sand shrimp (*Gammarus insensibilis*) and the nationally scarce starlet sea anemone (*Nematostella vectensis).*	<u>Annex I Habitat</u> - Coastal lagoons*
Solent Maritime SAC	The Solent Maritime SAC comprises a major estuarine system covering an area of approximately 11,325 ha on the south coast of England. The Solent and its inlets are unique in Britain and Europe for their unusual tidal regime, including double tides and long periods of tidal stand at high and low tide. As a result, the Solent Maritime SAC is a unique suite of functionally linked estuaries and dynamic marine and estuarine habitats. The site has the largest number of small estuaries in the tightest cluster anywhere in Great Britain, with examples of coastal plain estuaries (Yar, Medina, King's Quay Shore and Hamble) and bar-built estuaries (Newtown Harbour, Beaulieu, Langstone Harbour, Chichester Harbour). It is located in one of the only major sheltered channels in Europe, lying between a substantial island (the Isle of Wight) and the mainland. Sediment habitats within the site include extensive areas of intertidal mudflats and sandflats, often supporting eelgrass (*Zostera sp.*), subtidal sandbanks, saltmarsh and natural shoreline transitions such as drift line vegetation. The Solent Maritime SAC is of particular interest as it is the only site to support all four species of cordgrass (*Spartina*) found in the UK, including the rare native	<u>Annex I Habitat</u> - Annual vegetation of drift lines - Atlantic salt meadows *(Glauco-Puccinellietalia maritimae)* - Coastal lagoons* - *Spartina* swards - Estuaries - Mudflats and sandflats not covered by seawater at low tide - Perennial vegetation of stony banks - *Salicornia* and other annuals colonising mud and sand - Sandbanks which are slightly covered by sea water all the time - Shifting dunes along the shoreline with *Ammophila arenaria* ("white dunes") <u>Annex II Species</u> - Desmoulin's Whorl Snail *Vertigo moulinsiana*

Site Name	Description	Qualifying Features
	small cordgrass (*Spartina maritima*). The Solent Maritime SAC also includes a number of coastal lagoons, sand dunes at East Head and at the time of designation supported a population of the rare Desmoulin's whorl snail (*Vertigo moulinsiana*).	
New Forest SAC	The New Forest SAC encompasses an area of approximately 29,262 ha, located to the west of Southampton in Hampshire. The site comprises a mosaic of formerly common but now fragmented and rare habitats including lowland heath, valley and seepage step mire, or fen, and ancient pasture woodland, including riparian and bog woodland and a range of acid to neutral grasslands, over eroded terraces of soft sedimentary clays and sands capped with flint gravel of the Hampshire Basin. Outstanding examples of thirteen habitats of European interest are represented together with two priority habitat types, bog woodland and riverine woodland, which support an exceptionally rich diversity of fauna and flora. Many of these habitats are dependent on the traditional management practices of grazing through Rights of Common complemented by annual heathland burning and cutting programmes.	<u>Annex I Habitat</u> - Alkaline Fens - Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (Alno-Padion, *Alnion incanae*, *Salicion albae*) * - *Asperulo-Fagetum* beech forests - Atlantic acidophilous beech forests with Ilex and sometimes also Taxus in the shrublayer (*Quercion robori-petraeae* or *Ilici-Fagenion*) - Bog woodland* - Depressions on peat substrates of the *Rhynchosporion* - European dry heaths - Molinia meadows on calcareous, peaty or clayey-silt-laden soils (*Molinion caeruleae*) - Northern Atlantic wet heaths with *Erica tetralix* - Old acidophilous oak woods with *Quercus robur* on sandy plains - Oligotrophic to mesotrophic standing waters with vegetation of the *Littorelletea uniflorae* and/or of the *Isoëto-Nanojuncetea* - Oligotrophic waters containing very few minerals of sandy plains (*Littorelletalia uniflorae*) - Transition Mires and Quaking Bogs <u>Annex II Species</u> - Great Crested Newt *Triturus cristatus* - Southern Damselfly *Coenagrion mercuriale* - Stag Beetle *Lucanus cervus*

* Denotes priority feature

Table 3.2: SPA Qualifying Features

Site Name	Description	Qualifying Features
Chichester and Langstone Harbours SPA	Chichester and Langstone Harbours are located on the south coast of England in Hampshire and West Sussex, covering an area of approximately 5,811 ha. They are large, sheltered estuarine basins comprising extensive sand- and mud-flats exposed at low tide. The two harbours are joined by a stretch of water that separates Hayling Island from the mainland. Tidal channels drain the basin and penetrate far inland. The mud-flats are rich in invertebrates and also support extensive beds of algae, especially *Enteromorpha sp.*, and eelgrasses *Zostera spp.* The basin contains a wide range of coastal habitats supporting important plant and animal communities. The site is of particular significance for waterbirds, especially in migration periods and in winter. It also supports important colonies of breeding terns.	Wild Birds Directive Article 4.1 Qualification: Annex I Species - Little Tern *Sterna albifrons* (Breeding) - Common Tern *Sterna hirundo* (Breeding) - Sandwich Tern *Sterna sandvicensis* (Breeding) - Bar-tailed Godwit *Limosa lapponica* (Non-breeding) Wild Birds Directive Article 4.2 Qualification: Migratory Species not listed in Annex I - Pintail *Anas acuta* (Non-breeding) - Shoveler *Anas clypeata* (Non-breeding) - Eurasian Teal *Anas crecca* (Non-breeding) - Wigeon *Anas Penelope* (Non-breeding) - Turnstone *Arenaria interpres* (Non-breeding) - Dark-bellied Brent Goose *Branta bernicla bernicla* (Non-breeding) - Sanderling *Calidris alba* (Non-breeding) - Dunlin *Calidris alpina alpine* (Non-breeding) - Ringed Plover *Charadrius hiaticula* (Non-breeding) - Red-breasted Merganser *Mergus serrator* (Non-breeding) - Eurasian Curlew *Numenius arquata* (Non-breeding) - Grey Plover *Pluvialis squatarola* (Non-breeding) - Shelduck *Tadorna tadorna* (Non-breeding) - Redshank *Tringa tetanus* (Non-breeding) Waterbird Assemblage
Portsmouth Harbour SPA	Portsmouth Harbour SPA covers an area of approximately 1,249 ha comprising a large, industrialised estuary. Together with the adjacent Chichester and Langstone Harbours, it forms one of the most important sheltered intertidal areas on the south coast of England. The harbour has been classified as an SPA due to internationally and nationally important numbers of birds and specifically protects the following features: dark-bellied Brent goose; red-breasted merganser; dunlin; and black-tailed godwit. The SPA is composed of	Wild Birds Directive Article 4.2 Qualification: Migratory Species not listed in Annex I - Dark-bellied Brent Goose *Branta bernicla bernicla* (Non-breeding) - Dunlin *Calidris alpina alpine* (Non-breeding) - Black-tailed Godwit *Limosa limosa islandica* (Non-breeding)

Site Name	Description	Qualifying Features
	extensive intertidal mudflats and sandflats with seagrass beds, areas of saltmarsh, shallow coastal waters, coastal lagoons and coastal grazing marsh. At low tide the extensive mudflats are exposed, the water drained by channels and creeks uniting to form a narrow exit into the Solent. There is comparatively little freshwater input to Portsmouth Harbour. The largest input is the River Wallington, which flows into Fareham Creek in the north-west of Portsmouth Harbour. The estuarine sediments support rich populations of intertidal invertebrates, which provide an important food source for overwintering birds. There are approximately 77 ha of seagrass beds in Portsmouth Harbour, which are found mainly in the north-west of the harbour. These beds include both *Zostera marina* (found on the low shore) and *Zostera noltii* (on the upper to mid shore). The seagrass beds are amongst the most extensive in Britain and are an important food source for dark-bellied Brent goose. The saltmarsh areas are mainly comprised of cordgrass (*Spartina*) swards and provide feeding and roosting areas for overwintering birds.	- Red-breasted Merganser *Mergus serrator* (Non-breeding)
Solent and Dorset Coast SPA	The Solent and Dorset Coast SPA was formally designated in February 2020. The site is located on the south coast within the English Channel, comprising approximately 255 square nautical miles (SNM) and extending from the Isle of Purbeck in the West to Bognor Regis in the East, following the coastline on either side to the Isle of Wight and into Southampton Water. The site is intended to protect important foraging areas at sea used by breeding colonies in nearby SPA. There are already four SPA within the Greater Solent that are designated for breeding terns. These are Chichester & Langstone Harbours SPA (for Sandwich and little tern), the Solent and Southampton Water SPA (for common, Sandwich and little tern) and Pagham Harbour SPA (little tern). The fourth associated SPA lies within Poole Harbour (common tern and Sandwich tern). The new SPA covers the area that the breeding terns use for foraging during April to September. Whilst management measures are already in place in this foraging area due to the existing SPA, the classification of this new site will provide clarity to stakeholders about the areas the terns forage within and the species that require consideration. The site includes the sub-tidal areas not currently encompassed in the existing SPAs. Therefore its landward boundary is at mean low water (MLW) where it abuts any existing	<u>Wild Birds Directive Article 4.1 Qualification: Annex I Species</u> - Little Tern *Sterna albifrons* (Breeding) - Sandwich Tern *Sterna sandvicensis* (Breeding) - Common Tern *Sterna albifrons* (Breeding)

Site Name	Description	Qualifying Features
	SPA where terns are already a feature. Elsewhere the landward boundary is the mean high water (MHW) so as to afford the birds protection within the intertidal areas; for example at Portsmouth Harbour. However, the landward boundary of the SPA extends to MHW within Pagham Harbour and hence overlaps with the existing SPA (Natural England, 2016; p.20). This is because the easternmost extremity of the SPA is determined by the modelled usage of Sandwich terns foraging from Chichester & Langstone Harbours SPA, and Sandwich terns are not a qualifying feature of Pagham Harbour SPA.	
Solent and Southampton Water SPA	The Solent and Southampton Water SPA covers approximately 5,506 ha and is located on the south English coast. The area covered extends from Hurst Spit to Hill Head along the south coast of Hampshire, and from Yarmouth to Whitecliff Bay along the north coast of the Isle of Wight. The site comprises a series of estuaries and harbours with extensive mud-flats and saltmarshes together with adjacent coastal habitats including saline lagoons, shingle beaches, reedbeds, damp woodland and grazing marsh. The mud-flats support beds of *Enteromorpha spp.* and *Zostera spp.* and have a rich invertebrate fauna that forms the food resource for the estuarine birds. In summer, the site is of importance for breeding seabirds, including gulls and four species of terns. In winter, the SPA holds a large and diverse assemblage of waterbirds, including geese, ducks and waders. Dark-bellied Brent goose *Branta b. bernicla* also feed in surrounding areas of agricultural land outside the SPA/Ramsar.	<u>Wild Birds Directive Article 4.1 Qualification: Annex I Species</u> - Mediterranean Gull *Larus melanocephalus* (Breeding) - Little Tern *Sterna albifrons* (Breeding) - Roseate Tern *Sterna dougalli* (Breeding) - Common Tern *Sterna hirundo* (Breeding) - Sandwich Tern *Sterna sandvicensis* (Breeding) <u>Wild Birds Directive Article 4.2 Qualification: Migratory Species not listed in Annex I</u> - Teal *Anas crecca* (Non-breeding) - Dark-bellied Brent Goose *Branta bernicla bernicla* (Non-breeding) - Ringed Plover *Charadrius hiaticula* (Non-breeding) - Black-tailed Godwit *Limosa limosa islandica* (Non-breeding) Waterbird Assemblage
The New Forest SPA	The New Forest SPA covers approximately 28,003 ha and is located in southern Hampshire. The New Forest is an area of semi-natural vegetation including valley mires, fens and wet heath within catchments whose uncultivated and undeveloped state buffer the mires against adverse ecological change. The habitats present are of high ecological quality and diversity with undisturbed transition zones. The suite of mires is regarded as the locus classicus of this type of mire in Britain. Other wetland habitats include numerous ponds of varying size and water chemistry including several ephemeral ponds and a network of small streams mainly acidic in character which have no lowland equivalent in the UK. The plant communities in the numerous valleys and seepage step mires show considerable variation,	<u>Wild Birds Directive Article 4.1 Qualification: Annex I Species</u> - Nightjar *Caprimulgus europaeus* (Breeding) - Woodlark *Lullula arborea* (Breeding) - Honey Buzzard *Pernis apivorus* (Breeding) - Dartford Warbler *Sylvia undata* (Breeding) - Hen Harrier *Circus Cyaneus* (Non-breeding) <u>Wild Birds Directive Article 4.2 Qualification: Migratory Species not listed in Annex I</u> - Hobby *Falco Subbuteo* (Non-breeding)

Site Name	Description	Qualifying Features
	being affected especially by the nutrient content of groundwater. In the most nutrient-poor zones, Sphagnum bog-mosses, cross-leaved heath, bog asphodel, common cottongrass and similar species predominate. In more enriched conditions the communities are more fen-like. The area supports important populations of breeding birds associated with such habitats.	- Wood Warbler *Phylloscopus sibilatrix* (Non-breeding)

Table 3.3: Ramsar Qualifying Features

Site Name	Description	Qualifying Features
Chichester and Langstone Harbours Ramsar	Chichester and Langstone Harbours are large, sheltered estuarine basins comprising extensive mud and sand flats exposed at low tide. The site is of particular significance for over-wintering wildfowl and waders and also a wide range of coastal and transitional habitats supporting important plant and animal communities.	<u>Criterion 1</u> - Two outstanding estuarine basins, the site includes intertidal mudflats, saltmarsh, sand and shingle spits and sand dunes <u>Criterion 5</u> - Winter assemblage of 76,480 waterfowl (5 year peak mean 1998/99 - 2002/03) <u>Criterion 6</u> <u>Breeding</u> - Little Tern *Sterna albifrons albifrons* <u>Overwintering</u> - Dark-bellied Brent Goose *Branta bernicla bernicla* - Dunlin *Calidris alpina alpina* - Grey Plover *Pluvialis squatarola* - Common Shelduck *Tadorna tadorna* <u>On passage</u> - Ringed Plover *Charadrius hiaticula* - Black-tailed Godwit *Limosa limosa islandica* - Common Redshank *Tringa totanus totanus*
Portsmouth Harbour Ramsar	Portsmouth Harbour is a large industrialised estuary and includes one of the four largest expanses of mudflats and tidal creeks on the south coast of Britain. The mudflats support large beds of narrowleaved and dwarf eelgrass, extensive green alga and sea lettuce. The harbour has only a narrow connection to the sea via the Solent, and receives comparatively	<u>Criterion 3</u> - Important species assemblage across a number of habitats, species include; extensive beds of eelgrass *Zostera angustifolia* and *Zostera ulvae*, mud-snail *Hydrobia ulvae*, Common cord-grass

Site Name	Description	Qualifying Features
	little freshwater, thus giving it an unusual hydrology. The site supports internationally important numbers of wintering dark-bellied brent geese and nationally important numbers of grey plover, dunlin and black-tailed godwit.	*Spartina anglica*, green algae *Enteromorpha spp*, sea lettuce *Ulva lactuca*, sea purslane *Halimione portulacoides*. Criterion 6 Overwintering - Dark-bellied Brent Goose *Branta bernicla bernicla*
Solent and Southampton Water Ramsar	The area covered extends from Hurst Spit to Gilkicker Point along the south coast of Hampshire and along the north coast of the Isle of Wight. The site comprises of estuaries and adjacent coastal habitats including intertidal flats, saline lagoons, shingle beaches, saltmarsh, reedbeds, damp woodland, and grazing marsh. The diversity of habitats support internationally important numbers of wintering waterfowl, important breeding gull and tern populations and an important assemblage of rare invertebrates and plant.	Criterion 1 - Many wetland habitats characteristic of the biogeographic region: saline lagoons, saltmarshes, estuaries, intertidal flats, shallow coastal waters, grazing marshes, reedbeds, coastal woodland and rocky boulder reefs. Criterion 2 - Important assemblage of rare plants and invertebrates: 33 British Red Data Book invertebrates and at least eight British Red Data Book plants are represented on site. Criterion 5 Winter assemblage of 51,343 Waterfowl over winter (5 year peak mean 1998/99-2002/2003). Criterion 6 On Passage - Ringed Plover *Charadrius hiaticula* Overwintering - Dark-bellied Brent Goose *Branta bernicla bernicla* - Teal *Anas crecca* - Black-tailed Godwit *Limosa limosa islandica*
The New Forest Ramsar	The New Forest is an area of semi-natural vegetation including valley mires, fens and wet heath within catchments whose uncultivated and undeveloped state buffer the mires against adverse ecological change. The habitats present are of high ecological quality and diversity with undisturbed transition zones. The suite of mires is regarded as the *locus classicus* of this type of mire in Britain. Other wetland habitats include numerous ponds of varying size and water chemistry including	Criterion 1 - High density of Valley more and wet heaths Criterion 2 - Diverse assemblage of wetland plants and animals; seven species of nationally rare plant and 65 British Red Data Book species of invertebrate.

Site Name	Description	Qualifying Features
	several ephemeral ponds and a network of small streams mainly acidic in character which have no lowland equivalent in the UK. The plant communities in the numerous valleys and seepage step mires show considerable variation, being affected especially by the nutrient content of groundwater. In the most nutrient-poor zones, *Sphagnum* bog-mosses, cross-leaved heath, bog asphodel, common cottongrass and similar species predominate. In more enriched conditions the communities are more fen-like.	Criterion 3 - Mire habitats of ecological quality and diversity with undisturbed transition zones. The invertebrate fauna of the site is important due to the concentration of rare and scare wetland species. The whole site complex, with its examples of semi-natural habitats is essential to the genetic and ecological diversity of southern England.

3.3 Conservation Objectives for Ramsar Sites

3.3.1 Ramsar sites do not have agreed conservation objectives, but in most instances overlap with SPA site boundaries. However, it should be noted that Ramsar qualifying features can include a range of habitats and non-bird species common to SAC designations, as well as bird species and assemblages and their supporting habitats, which are common to SPAs.

3.3.2 Of the Ramsar sites around Fareham, the qualifying Ramsar Convention criteria for the Solent and Southampton Water, Portsmouth Harbour, and Chichester and Langstone Harbours sites overlap substantially with the features of their equivalent SPAs. No additional conservation objectives are defined to assess these features, and those relating to the equivalent SPAs can be used in the assessment.

3.3.3 Conversely, the Ramsar criteria for the New Forest overlap with the features of its equivalent SAC. No additional conservation objectives are defined to assess these features, and those relating to the SAC can be used in the assessment.

3.4 Condition Status

3.4.1 The conservation status of European sites is not routinely reported by Natural England, but it carries out condition monitoring of Sites of Special Scientific Interest (SSSI) at regular intervals. Although not exactly matching the boundaries of European sites, and being notified for different purposes, the condition status of a SSSI helps to give an impression of the overall ecological status of the SAC/SPA/Ramsar with which it coincides. The latest condition assessments (July 2020) of SSSIs forming part of the European sites within the scope of this assessment are illustrated on Figure 3.2.

Table 3.4: Conservation objectives for SAC and SPA

Conservation objectives for SAC (and New Forest Ramsar)
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: *[To the extent applicable to qualifying natural habitats or qualifying species:]* ▪ 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 population of qualifying species; and ▪ The distribution of qualifying species within the site.
Conservation objectives for SPA (and Ramsars other than New Forest)
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.

Fareham Local Plan

SSSI Condition Assessment

- FAVOURABLE
- UNFAVOURABLE RECOVERING
- UNFAVOURABLE NO CHANGE
- UNFAVOURABLE DECLINING
- PART DESTROYED
- DESTROYED
- NOT ASSESSED
- Special Areas of Conservation
- Special Protection Areas
- Borough

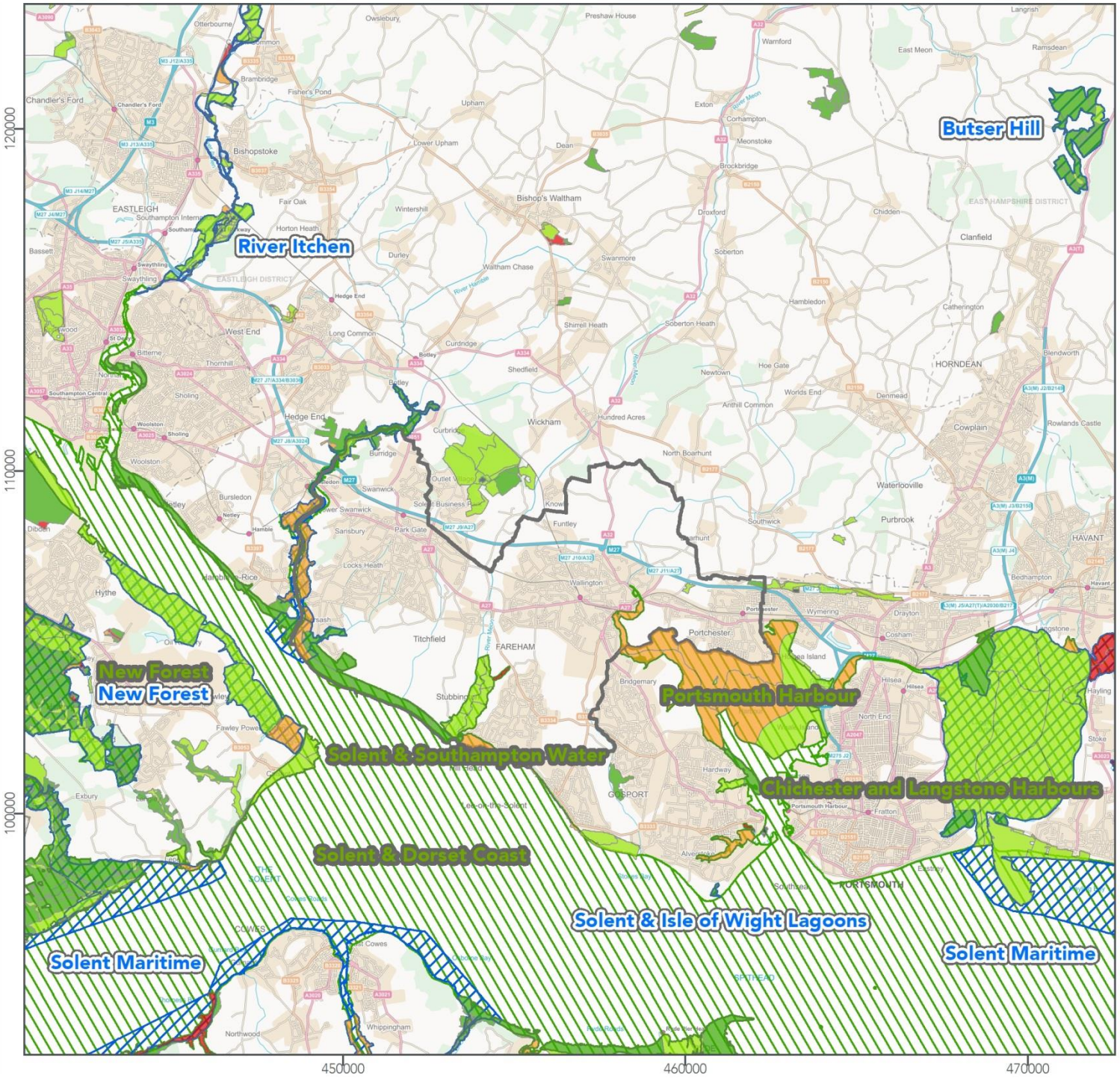

Figure 3.2: European Sites and SSSI Units Condition Assessment

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Kilometers

N

Scale: 1:165,000 **Created by:** JC
Date: Jul 2020 **Reviewed by:** GC
Drawing number:
UE-0192_HRA_Int_Site_&_SSSI_Con_200720

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4 European Site Characterisation

4.1 SPA Bird Populations and Ecology

4.1.1 The following summaries have been adapted from the UK SPA Review[7], published by the Joint Nature Conservancy Committee (JNCC; 2016), together with a review of other available literature on the behaviour and ecology of these species[8]. Where available species accounts have been supplemented by core count data presented in the Wetlands Bird Survey (WeBS) report for 2018/19 (Frost *et al*. 2020) and earlier years. The data have been obtained from four separate survey areas: Chichester Harbour, Langstone Harbour, Portsmouth Harbour and Southampton Water. These areas do not exactly correspond with the boundaries of European designated sites, but provide an insight to species population trends throughout the area. Maps of the WeBS survey areas considered as part of this report are shown in Figure 4.1 to Figure 4.4 overleaf.

4.1.2 Predicted impacts of climate change to particular bird species are adapted from the UK SPA Review and are based on two models, the Climatic Atlas of European Breeding Birds (Climatic Atlas)[9] and the Climate Change Impacts on Avian Interests of Protected Area Networks (CHAINSPAN)[10]. Predicted impacts of climate change to Annex I species have been adapted from Natural England's Supplementary Advice on Conservation Objectives documents and other available literature on the ecology of the species. Where relevant species are included, additional information relating to the impacts of climate change have also been adapted from Natural England's Climate Change Adaptation Manual (Natural England, 20219c).

Dark-bellied Brent Goose

4.1.3 Brent Geese have a circumpolar distribution breeding in the extreme high Arctic in all northern countries. The Dark-bellied Brent Goose *Branta bernicla bernicla* breeds in the Russian high Arctic. The main wintering areas of Dark-bellied Brent Geese in the UK are in England, along the North Sea and Channel coasts, from The Wash south to Poole Harbour. Important concentrations are found around The Wash, along the Norfolk, Essex and north Kent coasts, and in the natural harbours of the south coast.

[7] http://archive.jncc.gov.uk/page-7309

[8] https://www.iucnredlist.org/, http://www.bto.org/about-birds, http://www.birdlife.org/datazone/species/search

[9] The Climatic Atlas of European Breeding Birds (Climatic Atlas) (Huntley *et al*. 2007) models current distributions against current climate and then projects these to reflect models of future climatic change to predict the distribution of European breeding birds at and beyond the end of the 21st century. However, it does not take into account how bird habitats will change and move.

[10] The Climate Change Impacts on Avian Interests of Protected Area Networks (CHAINSPAN) project (Pearce-Higgins *et al*. 2011) modelled future abundance as well as presence/absence. Here, impacts are shown against a medium emissions scenario for 2050. The medium emissions scenario is derived from the UK Climate Projections 2009 (UKCP09) and describes a future world of very rapid economic growth, population growth peaking at nearly 9 billion in 2050 and the continued use of fossil fuels, but with substitution of renewable energy sources for some fossil fuel use.

4.1.4 The GB population of Dark-bellied Brent Geese is estimated at 91,000 individuals (Musgrove *et al.* 2011), representing 37.9% of the biogeographic population (240,000; Wetlands International 2012). Of the GB population, 80.8% (73,532; Stroud *et al.* 2016) occur within SPA sites for which the species is a qualifying feature. The species is a vulnerable species of European conservation concern and an Amber listed Bird of Conservation Concern in the UK, due to being a species of European Concern with a localised and important non-breeding population.

4.1.5 The traditional wintering habitat is mostly shallow coasts and estuaries with extensive mudflats and intertidal areas, as Dark-bellied Brent Geese rarely occur far from the sea and feed on intertidal plants such as *Zostera, Enteromorpha* and a small range of littoral plants. In recent years the species has taken to grazing on coastal cultivated grasslands and winter cereal fields. An investigation carried out in one of the species' wintering areas (UK) found that it was most likely to forage on dry, improved grasslands that had high abundances of the grass *Lolium perenne*, were between 5 and 6 ha in area, and were at a distance of up to 1.5 km inland or 4-5 km along the coast from coastal roosting sites (BirdLife International 2020).

4.1.6 This species is considered to be susceptible to disturbance from vehicles in the UK, although it is relatively tolerant of human disturbance, e.g. walkers, compared to other species. In its winter range the species may be persecuted by farmers, as in recent years it has increasingly taken to grazing on cultivated grasslands and winter cereal fields near the coast (BirdLife International 2020).

4.1.7 By 2050, under a medium emissions scenario, numbers of Dark-bellied Brent Goose within SPA sites are anticipated by CHAINSPAN, with moderate confidence, to increase by over 50%.

4.1.8 As shown in Table 4.1 Portsmouth Harbour, Chichester Harbour, Langstone Harbour and Southampton Water are currently maintaining internationally important numbers of Dark-bellied Brent Geese (over 2,100 individuals). The average numbers recorded for Southampton Water in the 2009-2014 and 2014-2019 periods fell below the threshold for an internationally important population, although still remaining within the limits set for a nationally important population (980 individuals). It should be noted that this WeBS recording area does not include the Solent which forms a substantial part of the SPA.

Fareham Local Plan

Chichester Harbour

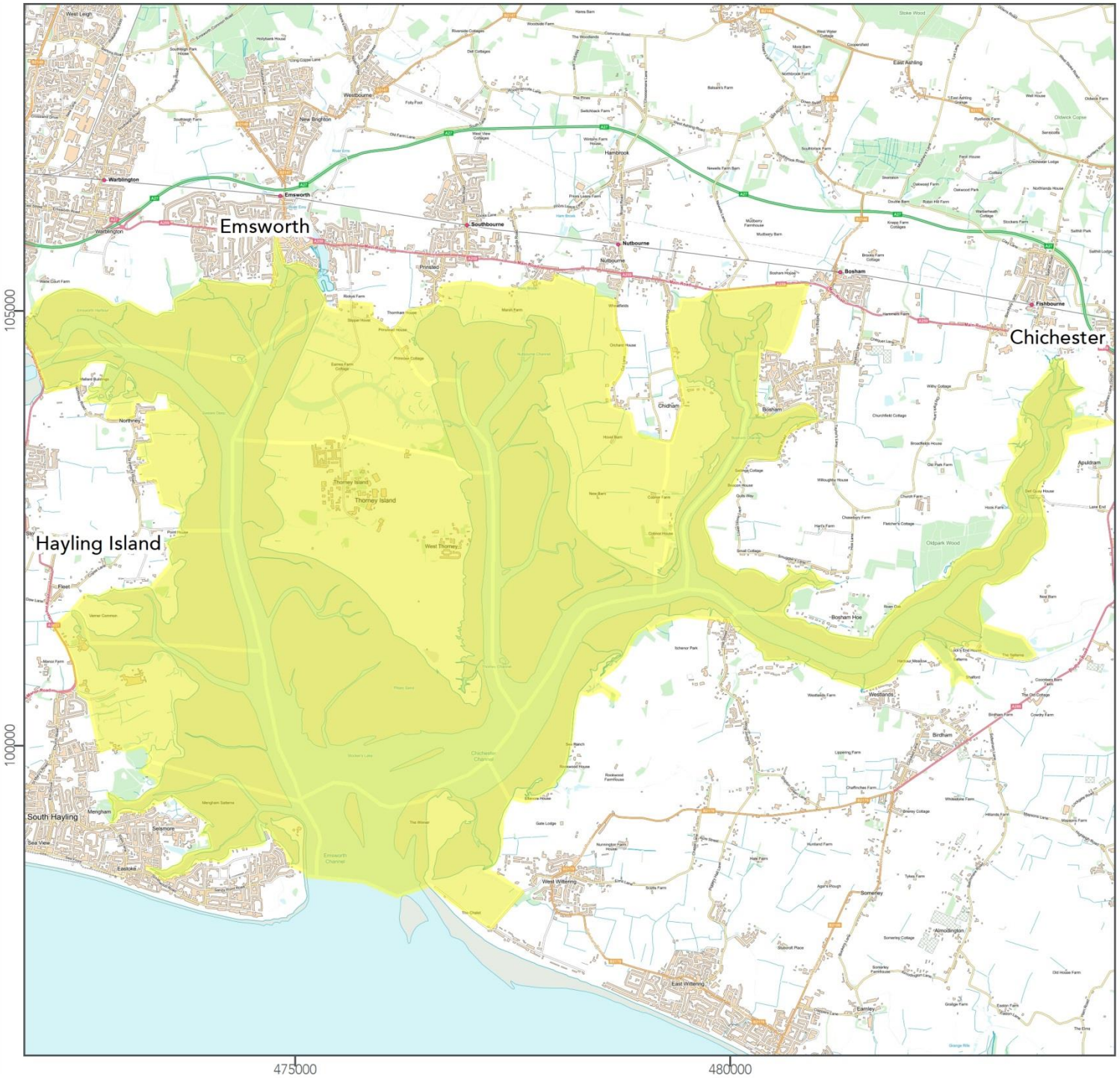

Figure 4.1: Chichester Harbour WeBS Survey Area

0 1 2
Kilometers

N

Scale: 1:65,000 **Created by:** JC
Date: Feb 2020 **Reviewed by:** GC
Drawing number:
UE-0192_HRA_WeBS_Chichester_200219

URBAN EDGE ENVIRONMENTAL CONSULTING
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Web: www.ueec.co.uk

Fareham Local Plan

Langstone Harbour

Figure 4.2: Langstone Harbour WeBS Survey Area

0 1 2
Kilometers

N

Scale: 1:50,000 **Created by:** JC
Date: Feb 2020 **Reviewed by:** GC
Drawing number:
UE-0192_HRA_WeBS_Langstone_200219

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Fareham Local Plan

Portsmouth Harbour

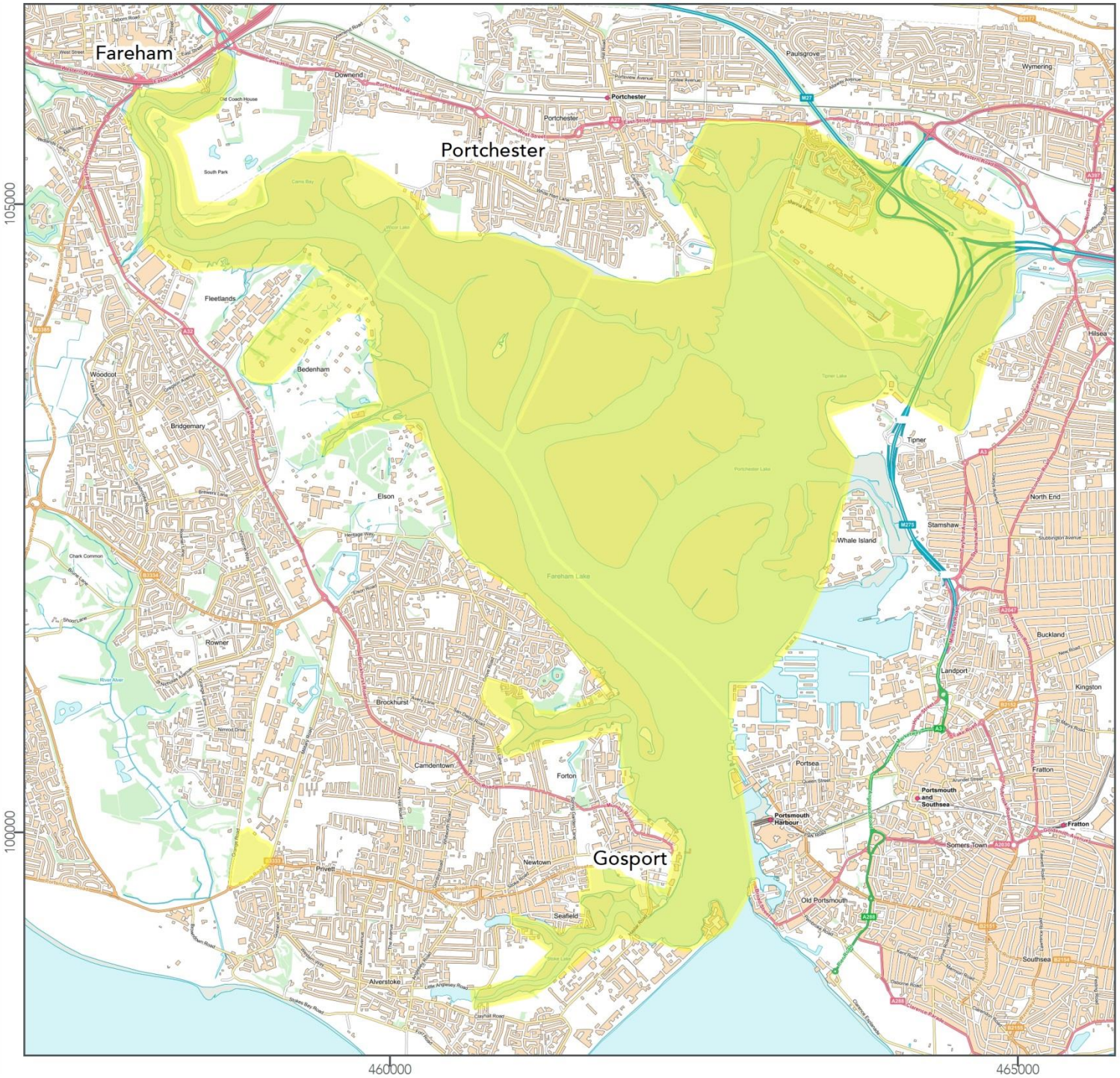

Figure 4.3: Portsmouth Harbour WeBS Survey Area

0 1 2
Kilometers

N

Scale: 1:45,000 **Created by:** JC
Date: Feb 2020 **Reviewed by:** GC
Drawing number:
UE-0192_HRA_WeBS_Portsmouth_200219

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Web: www.ueec.co.uk

Fareham Local Plan

Southampton Water

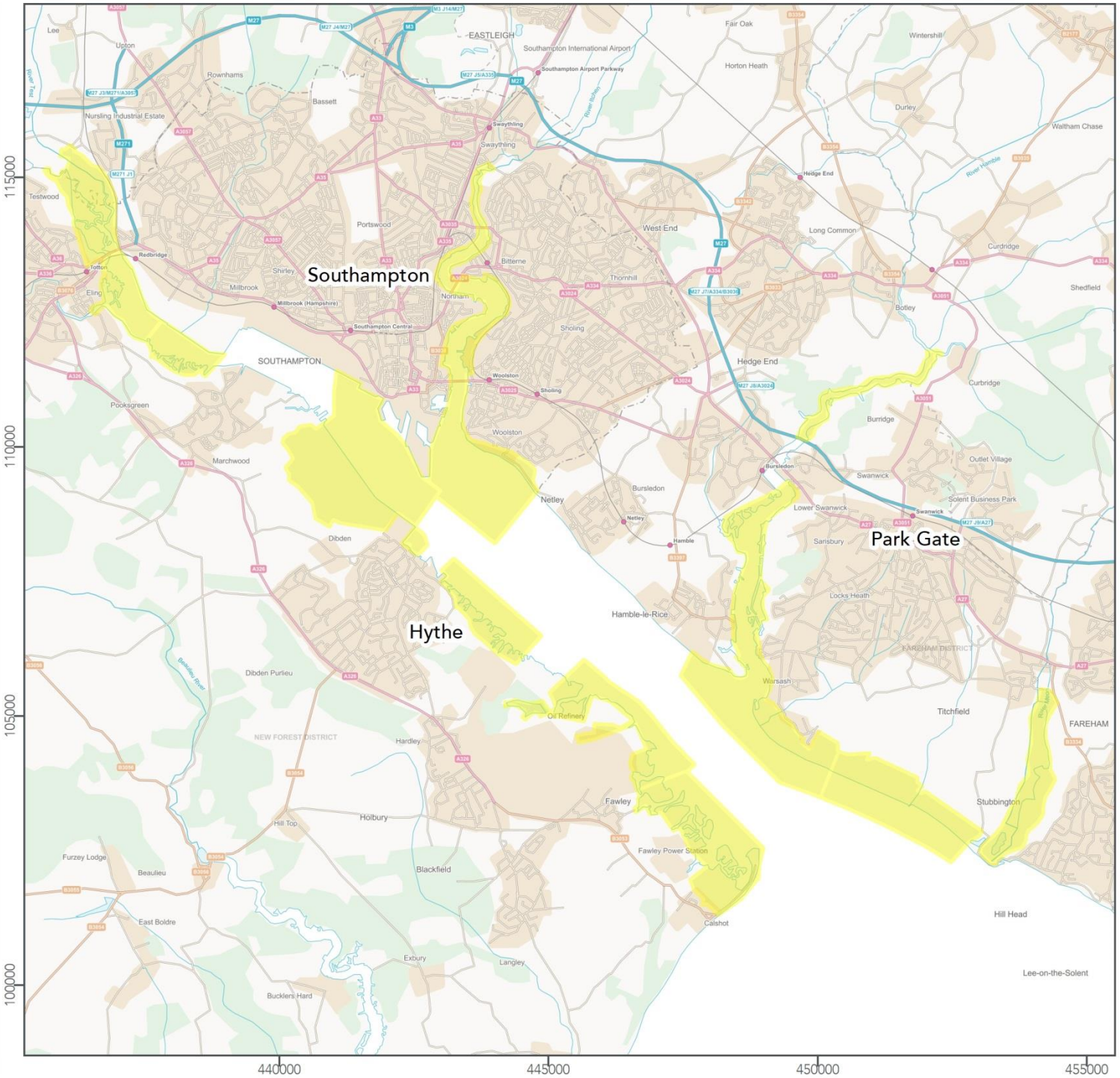

Figure 4.4: Southampton Water WeBS Survey Area

0 2 4
Kilometers

N

Scale: 1:105,000 **Created by:** JC
Date: Feb 2020 **Reviewed by:** GC
Drawing number:
UE-0192_HRA_WeBS_Southampton_Water_200219

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Table 4.1: WeBS Core Count data for Dark-bellied Brent Goose

Survey Area	09/10	10/11	11/12	12/13	13/14	5yr Avg
Portsmouth Harbour	(2,030)	2,054	(2,819)	(2,106)	(3,062)	2,510
Chichester Harbour	8,569	11,434	10,309	10,868	11,206	10,477
Langstone Harbour	4,930[12]	3,947	5,690	5,212	5,507	5,057
Southampton Water	1,055[12]	1,649	2,496	1,257	2,395	1,770
	14/15	**15/16**	**16/17**	**17/18**	**18/19**	**5yr Avg**
Portsmouth Harbour	2,953	(2,304)	(1,462)	(2,142)	2,185	2,569
Chichester Harbour	16,446	14,260	13,058	16,354	8,721	13,768
Langstone Harbour	5,201	(5,563)	5,552	4,789	(4,796)	5,276
Southampton Water	3,355	1,893	1,592	2,174	2,100	2,223

(X) Incomplete count
X[10] WeBS low tide count
X[11] Roost count
X[12] Supplementary daytime count

Dunlin

4.1.9 Most Dunlin wintering in north-west Europe are of the nominate sub-species *alpina* which breeds in Scandinavia and Russia. After Lapwings, Dunlins are the most numerous wader in the UK in winter and are found on estuaries and open coasts throughout the country. They occur in particularly high densities in estuaries, and several important sites are on eastern or south-eastern coasts.

4.1.10 The GB population of Dunlin is estimated at 350,000 individuals (Musgrove *et al.* 2011), representing 26.3% of the biogeographic population (1,333,000; Stroud *et al.* 2004; Wetlands International 2012). Of the GB population, 85.1% (297,892; Stroud *et al.* 2016) occur within SPA sites for which the species is a qualifying feature. The species is a vulnerable species of European conservation concern and an Amber listed Bird of Conservation Concern in the UK, due to being a species of European Concern which has undergone a moderate decline in the UK non-breeding population size, (>25% but <50%) over the longer-term and a moderate breeding range decline (>25% but <50%) between 1988-91 and 2007-11.

4.1.11 Overwintering Dunlin mainly prefer estuarine mudflats, but also frequent a wide variety of freshwater and brackish wetlands, both coastal and inland. For roosting during high tides and at night this species prefers large fields of naturally fertilised short pasture or soil-based crops with few vertical structures that could be used by predators.

4.1.12 In the winter this species is restricted to a small number of estuaries, making it vulnerable to changes in this habitat for example through land reclamation or the invasion of alien plant species (such as the grass *Spartina anglica* which has spread on British mudflats, resulting in the reduction in size of feeding areas available). The species is also threatened by disturbance on intertidal mudflats from construction work and foot-traffic on footpaths. It has been shown that provision of well-surfaced paths in breeding areas which receive over 30 visitors a day can reduce the impact of human disturbance on this species' reproductive success (BirdLife International 2020).

4.1.13 By 2050, under a medium emissions scenario, spring passage numbers of non-breeding Dunlin within SPA sites are anticipated by CHAINSPAN, with poor confidence, to increase by over 50%.

4.1.14 As shown in Table 4.2 Chichester Harbour is currently maintaining internationally important numbers of Dunlin (over 13,300 individuals). Langstone Harbour had previously maintained an internationally important number of Dunlin (2009-2015), however the average numbers recorded have now fallen below the threshold (2014-2019), although still remaining within the limits set for a nationally important population (over 3,400 individuals). Portsmouth Harbour also supports a nationally important population of Dunlin.

Table 4.2: WeBS Core Count data for Dunlin

Survey Area	09/10	10/11	11/12	12/13	13/14	5 yr Avg
Portsmouth Harbour	(6,530)	(4,182)	(6,575)	4,070	(5,449)	5,361
Chichester Harbour	17,465	16,658	15,474	12,099	14,799	15,299
Langstone Harbour	13,568[12]	12,319	21,710	15,204	16,908	15,942
	14/15	**15/16**	**16/17**	**17/18**	**18/19**	**5 yr Avg**
Portsmouth Harbour	6,254[12]	(604)	(620)	1,090	5,339	4,228
Chichester Harbour	8,821	9,853	12,830	12,960	14,252	11,743
Langstone Harbour	13,543	12,563	15,220	10,860	11,282	12,694

Black-tailed Godwit

4.1.15 The Icelandic population of Black-tailed Godwit *Limosa limosa islandica* breeds mainly in Iceland and sporadically in the Faeroes, Britain and Ireland. This sub-species winters mainly in Britain, Ireland and western France, and south to Morocco, with the main concentrations on the muddy estuaries of the south coasts of Ireland and England.

4.1.16 The GB population of Black-tailed Godwit is estimated at 43,000 individuals (Musgrove *et al.* 2011), representing 70.5% of the biogeographic population (61,000; Gill *et al.* 2007; Wetlands International 2012). Of the GB population, 67.4% (Stroud *et al.* 2016) occur within SPA sites for which the species is a qualifying feature. The species is a vulnerable species of European conservation concern and a Red listed Bird of Conservation Concern in the UK, due to being a species of European Concern which has undergone a severe decline in the UK breeding population range, of more than 50%, between 1988-91 and 2007-11.

4.1.17 Overwintering Black-tailed Godwits often winter in brackish habitat (such as sheltered estuaries and lagoons with large intertidal mudflats) and roost on damp pasture, often inland. Black-tailed Godwits feed mostly on worms whilst the tide is out.

4.1.18 This species is threatened by the loss of nesting habitat owing to wetland drainage and agricultural intensification. Detrimental activities include the conversion of wet meadows to arable land, increased fertilisation and drainage of grassland, artificial flooding of nesting habitats, earlier and more frequent cutting as farmers adapt to climate change, spring burning,

overgrowing by scrub, land claiming by businesses and developers, the construction of roads and parks, and disturbance by walkers. Habitat fragmentation may cause particular problems for this species, which nests in dispersed colonies and sub-colonies as protection against predators and may be unlikely to breed successfully in small areas of habitat (BirdLife International 2020).

4.1.19 By 2050, under a medium emissions scenario, spring passage numbers of non-breeding Black-tailed Godwit within SPA sites are anticipated by CHAINSPAN, with poor confidence, to increase by over 50%.

4.1.20 As shown in Table 4.3 the average numbers recorded for Chichester Harbour, Portsmouth Harbour, Langstone Harbour and Southampton Water fall below the threshold for an internationally important population, although they are still within the limits set for a nationally important population (over 390 individuals).

Table 4.3: WeBS Core Count data for Black-tailed Godwit

Survey Area	**09/10**	**10/11**	**11/12**	**12/13**	**13/14**	**5 yr Avg**
Portsmouth Harbour	(30)	(32)	(653)	(189)	361	507
Chichester Harbour	603	832	821	401	606	653
Langstone Harbour	574	705	317	319	423	468
Southampton Water	514	(440)	438	314	420	425
	14/15	**15/16**	**16/17**	**17/18**	**18/19**	**5 yr Avg**
Portsmouth Harbour	452[10]	(178)	(230)	673	200	442
Chichester Harbour	594	807	698	512	644	651
Langstone Harbour	607	570	652	419	487	547
Southampton Water	571	443	(416)	750	(387)	588

Red-breasted Merganser

4.1.21 Red-breasted Mergansers *Mergus serrator* are globally distributed at northern latitudes across northern Eurasia, Greenland and North America. In winter, birds migrate to coastal waters in the North and Baltic Seas, along Atlantic coasts, as well as further south to the Mediterranean, Black and Caspian Seas.

4.1.22 The GB population of Red-breasted Merganser is estimated at 8,400 individuals (Musgrove *et al.* 2011), representing 4.9% of the biogeographic population (170,000; Wetlands International 2013). Of the GB population, 14.2% (1,190; Stroud *et al.* 2016) occur within SPA sites for which the species is a qualifying feature. The species is not considered a species of European conservation concern and is a Green listed Bird of Conservation Concern in the UK.

4.1.23 During the winter, this species favours brackish or saline waters, preferring shallow, protected coasts, estuaries, bays and lagoons with an abundance of small fish and aquatic invertebrates. Red-breasted Mergansers occasionally use inland sites in Britain and Northern Ireland, but usually only during periods of harsh weather conditions.

4.1.24 The species is subject to persecution and may be shot by anglers and fish-farmers who accuse it of depleting fish stocks. It is also threatened by accidental entanglement and drowning in fishing nets. The species is also susceptible to avian influenza and may be threatened by future outbreaks of the virus (BirdLife International 2020).

4.1.25 By 2050, under a medium emissions scenario, numbers of Red-breasted Merganser within SPA sites are anticipated by CHAINSPAN, with moderate confidence, to increase by over 50%.

4.1.26 As shown in Table 4.4 none of the sites are currently maintaining internationally important numbers of Red-breasted Merganser (over 860 individuals). The latest average numbers recorded for Langstone Harbour and Chichester Harbour are within the limits set for a nationally important population (over 100 individuals).

Table 4.4: WeBS Core Count data for Red-breasted Merganser

Survey Area	09/10	10/11	11/12	12/13	13/14	5 yr Avg
Portsmouth Harbour	90	59	(69)	65	(47)	71
Chichester Harbour	253	213	217	154	267	221
Langstone Harbour	175[10]	137	205	143	223	177
	14/15	**15/16**	**16/17**	**17/18**	**18/19**	**5 yr Avg**
Portsmouth Harbour	109[10]	(43)	(74)	(27)	41	75
Chichester Harbour	222	76	97	103	136	127
Langstone Harbour	179	(185)	205	124	107	160

Grey Plover

4.1.27 The Grey Plover *Pluvialis squatarola* has a very restricted global distribution. They have an almost circumpolar breeding range, occurring in the high Arctic. Outside the breeding season, birds move south and west to winter on the coasts of north-west Europe, north and west Africa, the Mediterranean and the Middle East.

4.1.28 The GB population of Grey Plover is estimated at 43,000 individuals (Musgrove *et al.* 2011), representing 17.4% of the biogeographic population (247,000; Stroud *et al.* 2004). Of the GB population, 83.6% (35,931; Stroud *et al.* 2016) occur within SPA sites for which the species is a qualifying feature. The species is not considered a species of European conservation concern and is an Amber listed Bird of Conservation Concern in the UK due to its important, localised non-breeding population.

4.1.29 The distribution of Grey plovers is strongly localised to areas holding suitable habitats – principally the larger, muddier, estuaries and other soft-sediment coastlines. In Britain and Ireland, Grey Plovers occur on most coasts, although they are mainly concentrated in the south-east and north-west of England When on the coast in its wintering range the species takes marine worms, molluscs and crustaceans, occasionally also taking insects or earthworms when in inland habitats on passage (BirdLife International 2020).

4.1.30 In the UK there is evidence that the removal of *Spartina anglica* from tidal mudflats using herbicide is beneficial for the species. The species is threatened by disturbance from recreational activities (BirdLife International 2020).

4.1.31 By 2050, under a medium emissions scenario, spring passage numbers of Grey Plover within SPA sites are anticipated by CHAINSPAN, with moderate confidence, to increase by between 25-50%.

4.1.32 As shown in Table 4.5 none of the sites are currently maintaining internationally important numbers of Grey Plover (over 2,000 individuals). However, both Chichester Harbour and Langstone Harbour are within the limits set for a nationally important population (over 330 individuals).

Table 4.5: WeBS Core Count data for Grey Plover

Survey Area	09/10	10/11	11/12	12/13	13/14	5yr Avg
Chichester Harbour	1,960	897	1,463	1,450	1,222	1,398
Langstone Harbour	820	825	618	614	675	710
	14/15	**15/16**	**16/17**	**17/18**	**18/19**	**5yr Avg**
Chichester Harbour	1,536	1,667	1,443	1,354	957	1,391
Langstone Harbour	871	865	790	789	541	771

Ringed Plover

4.1.33 The Ringed Plover *Charadrius hiaticula* is an arctic and northern temperate breeding wader. Through much of its range it is an essentially high Arctic breeding bird, but the range extends to the temperate coasts of north-western Europe, including the UK as well as a few inland areas of Europe. The UK supports both breeding and non-breeding individuals.

4.1.34 The non-breeding GB population of Ringed Plover is estimated at 34,000 individuals (Musgrove *et al.* 2011), representing 46.6% of the biogeographic population (73,000; Stroud *et al.* 2004; Wetlands International 2012). Of the wintering GB population, 12.4% (4,206; Stroud *et al.* 2016) occur within SPA sites for which the species is a qualifying feature. The species is not considered a species of European conservation concern but is a UK Red listed Bird of Conservation Concern due to a severe decline in the UK non-breeding population size, of more than 50%, over 25 years.

4.1.35 Ringed Plovers have a wide breeding distribution around the coast of Britain and Ireland. In England, the extensive sandy and shingle beaches between the Thames and the Humber hold most of the population, but the islands off western Scotland are also very important for the population. Southerly populations, such as those in Britain and Ireland, breed mainly on coastal sand, gravel and shingle beaches, upper saltmarshes and artificial habitats such as the shores of gravel pits and reservoirs; although short-grazed coastal pastures, Outer Hebridean machair and arable fields in eastern England may also be frequently used. Breeding Ringed Plovers are highly site faithful.

4.1.36 The species is susceptible to avian botulism so may be threatened by future outbreaks of the disease and suffers predation from feral American mink *Neovison vison* in some regions (BirdLife International 2012).

4.1.37 By 2050, under a medium emissions scenario, autumn passage and wintering numbers of Ringed Plovers within SPA sites are anticipated by CHAINSPAN, with moderate confidence, to increase by over 50% and spring passage numbers are anticipated, with moderate confidence, to increase by up to 25%.

4.1.38 As shown in Table 4.6 Chichester Harbour is falling below the threshold for a nationally important population of Ringed Plover (over 540 individuals). Langstone Harbour and Southampton Water did not meet table-qualifying levels for Ringed Plover in the WeBS counts for 2009 to 2014 or 2014 to 2019, as indicated by the absence of records.

Table 4.6: WeBS Core Count data for Ringed Plover

Survey Area	09/10	10/11	11/12	12/13	13/14	5yr Avg
Chichester Harbour	422	221	(424)	750	512	476
	14/15	**15/16**	**16/17**	**17/18**	**18/19**	**5yr Avg**
Chichester Harbour	751	254	(209)	(271)	138	381

Common Tern

4.1.39 The Common Tern *Sterna hirundo* is a common and widespread breeding species of both coastal and inland regions in the northern hemisphere. It is a long-distance migrant and winters mainly in the southern hemisphere.

4.1.40 The GB population of breeding Common Tern is estimated at 10,000 pairs (Ratcliffe 2004b), representing just 3.6% of biogeographic population (280,000; Ratcliffe 2004b). Of the GB population, 45.6% (4,555; Stroud *et al.* 2016) occur within SPA sites for which the species is a qualifying feature. The species is not considered a species of European conservation concern but is an Amber listed Bird of Conservation Concern in the UK because of its localised breeding population.

4.1.41 Common Terns breed around coasts and beside inland freshwater bodies. Coastal sites are mainly small rocky islets, shingle beaches, sand-spits and dunes, as well as among short vegetation (occasionally more scrubby growth). Inland sites include shingle banks in rivers, islands in lakes and gravel pits, marshes and shallow lagoons. More artificial sites, including waste ground, specially made floating rafts and even gravel-covered flat-roofs, are occasionally used.

4.1.42 A significant proportion of the British population breeds in Scotland, particularly in the northern and western Isles and on the west coast, but with sizeable colonies also along the east coast firths. Common Terns also commonly breed inland on riverine shingle and islands, not only in Scotland but also in England. Coastal colonies in England are mainly concentrated in the north-east, East Anglia, at a few localities along the south coast, and in the north-west. The only Welsh

colonies are on Anglesey. Inland breeding takes place mainly in eastern Scotland and in central, eastern and southern England. Colonies in Ireland are well spread around the coasts, with scattered inland breeding through the midlands.

4.1.43 During the breeding season the species is vulnerable to human disturbance at nesting colonies (e.g. from off-road vehicles, recreation, motor-boats, personal watercraft and dogs), and to the flooding of nest sites as a result of naturally fluctuating water levels. On its breeding grounds the species is also threatened by habitat loss as a result of coastal development, erosion and vegetation overgrowth (rapid vegetation succession encroaching upon nesting habitats (BirdLife International 2020).

4.1.44 For Common Terns the Climatic Atlas predicts a patchy westerly and northerly distribution within the UK at and beyond the end of the 21st century.

4.1.45 As shown in Table 4.7 none of the sites are currently maintaining internationally important numbers of Common Tern (over 1,800 individuals). There are currently no British thresholds set for this species. However, Southampton Water exceeds the limits suggested by Holt *et al.* (2012) for a nationally important population (over 200 individuals). It should be noted that at the current time the recording of terns during WeBS surveys is optional. Chichester and Langstone Harbours did not meet table-qualifying levels for Common Tern in the WeBS counts for 2009 to 2014 or 2014 to 2019, as indicated by the absence of records.

Table 4.7: WeBS Core Count data for Common Tern

Survey Area	09/10	10/11	11/12	12/13	13/14	5 yr avg
Southampton Water	(260)	159	480	112	(24)	253
	14/15	**15/16**	**16/17**	**17/18**	**18/19**	**Mean**
Southampton Water	(35)	3	94	4	3	28

Little Tern

4.1.46 The Little Tern *Sterna albifrons* has a widely scattered global distribution. The European breeding distribution is discontinuous, but extends from the Gulf of Bothnia to the coasts of the Mediterranean and North Africa. Through much of this area, the species is restricted to the coast, although it breeds along a number of major river systems.

4.1.47 The GB population of Little Tern is estimated at 1,900 pairs (Pickerill 2004), representing 9.7% of the biogeographic population (19,500 pairs; Pickerill 2004). Of the GB population, 60.8% (1,156 pairs; Stroud *et al.* 2016) occur within SPA sites for which the species is a qualifying feature. The species is a declining species of European conservation concern and an Amber listed Bird of Conservation Concern in the UK with a localised breeding population which has suffered a moderate decline in its breeding range (>25% but <50%) between 1968-71 and 2007-11.

4.1.48 Little terns are found predominantly on low lying, soft coasts in southern and eastern England, with a concentration in East Anglia. There is a large colony in North Wales which is also a post breeding staging post and there is a population in south Cumbria. In Scotland, the population is less well monitored but is well distributed over south and west Scotland, with just a few

known colonies in North and East Scotland. The most northerly colony is on Orkney (Natural England, 2019c). Feeding takes place close to the colony, to a maximum distance of 6 km, but not more than 1.5 km offshore (Cramp *et al.* 1974).

4.1.49 The species is threatened by habitat destruction such as the development and industrial reclamation of coastal breeding habitats (e.g. for the development of new harbour facilities). The species is threatened by habitat loss and degradation through the development of the foreshore as well as relative sea level rise predicted due to climate change which threatens beach nesting habitats. The risk of habitat loss will be exacerbated by sea level rise which, together with more frequent storm events, could mean that nesting sites become more vulnerable to inundation.

4.1.50 The Red Fox *Vulpes vulpes* is a constant threat at various protected colonies in the UK. The population of Red Fox in the UK has increased in size and range due to changing game-keeping practices meaning they are likely to be an increased threat. It is also highly vulnerable to human disturbance (including birdwatchers) at coastal and inland nesting sites which can lead to nest failures. Egg collection is also an ongoing threat (BirdLife International 2012). Pesticide pollution and artificially induced water-level fluctuations in saltmarshes may also pose a threat to the species' reproductive success.

4.1.51 The Climatic Atlas predicts a scattered distribution of the Little Tern, mainly in England and northern Scotland at and beyond the end of the 21st century. By 2050, under a medium emissions scenario, numbers of breeding Little Tern are anticipated by CHAINSPAN, with moderate confidence, to increase by at least 50%. Although little terns may become more abundant in the north of their range, with climate change food availability could limit any potential expansion. Little terns could be affected by the impact of rising sea temperatures on populations of sand eels and clupeid fish (Natural England, 2019c).

4.1.52 The Chichester and Langstone Harbours and Southampton Water did not meet nationally or internationally important population levels for Little Tern in the WeBS counts for 2014 to 2019, as indicated by the absence of records.

Roseate Tern

4.1.53 The global distribution of Roseate Tern *Sterna dougallii* comprises a number of discrete ranges, with breeding occurring around the edges of the North Atlantic, Indian and south-west Pacific Oceans. In Europe, the breeding population is confined to Britain, Ireland and France (Brittany), as well as the Azores.

4.1.54 The GB population of breeding Roseate Terns is estimated at 86 pairs (Holling *et al.* 2012), representing just 4% of the biogeographic population (2,150 pairs; Newton 2004). Of the GB population, 94% (81 pairs; Stroud *et al.* 2016) occur within SPA sites for which the species is a qualifying feature. The species is listed as a rare species of conservation concern in Europe and a Red listed Bird of Conservation Concern in the UK due to severe decline in the UK breeding population size, of more than 50%, over 25 years and the longer term and a severe decline in the UK breeding range, of more than 50%, between the breeding bird atlases of 1968-71 and 2007-11.

4.1.55 Breeding takes place on the coast, with colonies established on sand-spits and dunes, shingle beaches and low rocky islets. Its diet consists predominantly of small pelagic fish, particularly sandeel (which are particularly important during chick rearing).

4.1.56 At the northern European breeding grounds, the most significant threats are human disturbance (e.g. from habitat development, off-road vehicles and recreation) and predation from both natural and introduced avian and ground predators (IUCN 2013).

4.1.57 The Climatic Atlas predicts a westerly and northerly distribution of breeding Roseate Tern in the UK with virtual absence from the coasts across England and Wales at and beyond the end of the 21st century.

4.1.58 A single individual was recorded in Southampton Water over the last ten years (2011).

Sandwich Tern

4.1.59 The European breeding distribution of Sandwich Tern *Sterna sandvicensis* stretches from north-west Europe from western France to the Baltic as well as scattered traditional localities around the coasts of the northern Mediterranean, Black and Caspian Seas.

4.1.60 The GB population of breeding Sandwich Tern is estimated at 11,000 pairs (Ratcliffe 2004a) which represents 14.9% of the biogeographic population (74,000; Ratcliffe 2004a). Of the GB population, 72.1% (7,932 pairs; Stroud *et al.* 2016) occur within SPA sites for which the species is a qualifying feature. The species is not considered a species of European conservation concern but is an Amber listed Bird of Conservation Concern in the UK due to a moderate decline in the UK breeding population size (>25% but <50%) over 25 years.

4.1.61 British colonies of Sandwich Tern are very scattered and generally confined to coastal shingle beaches, sand dunes and offshore islets. In a few areas, small islets in coastal freshwater bodies are used.

4.1.62 As only a few colonies exist each year this tern is highly vulnerable to anthropogenic disturbance and is known to abandon eggs en masse. The species has also suffered declines as a result of egging and hunting which are locally significant in some areas of its range (BirdLife International 2012).

4.1.63 The Climatic Atlas predicts a westerly and northerly distribution of the breeding Sandwich tern in the UK with virtual absence from the south and eastern coasts of England at and beyond the end of the 21st century. By 2050, under a medium emissions scenario, numbers of autumn passage Sandwich Tern within SPA sites are anticipated by CHAINSPAN, with poor confidence, to increase by up to 25%.

4.1.64 Chichester and Langstone Harbours and Southampton Water are not currently maintaining internationally important numbers of Sandwich Tern (over 1,700 individuals), with the greatest number recorded over the last ten years in 2011,102 individuals in Chichester Harbour.

Mediterranean Gull

4.1.65 The global distribution of Mediterranean Gull *Larus melanocephalus* is highly restricted, with breeding limited to just a few localities in Europe, particularly along the northern coast of the Black Sea. In the UK, which is at the north-western limit of the species' world range, breeding is extremely localised.

4.1.66 The GB population of breeding Mediterranean Gull is estimated at 600 pairs (Holling *et al.* 2012) which represents just 0.7% of the biogeographic population (81,000; Parsons 2004). Of the GB population, 24.2% (145 pairs; Stroud *et al.* 2016) occur within SPA sites for which the species is a qualifying feature. The species is not considered a species of European conservation concern but is an Amber listed Bird of Conservation Concern in the UK because of its small breeding population.

4.1.67 It nests near water on flood-lands, fields and grasslands and on wet or dry areas of islands favouring sparse vegetation but generally avoiding barren sand. Outside of the breeding season the species becomes entirely coastal favouring estuaries, harbours, saline lagoons and other sheltered waters. It is not known where the birds that breed in England spend the non-breeding season, but it seems likely that they use coastal areas near to the nesting colonies in south-east and south England.

4.1.68 This species sustains heavy losses as a result of tourist disturbance at breeding colonies. The species may also be threatened by habitat loss resulting from tourism development, and by marine pollution (IUCN 2013).

4.1.69 The Climatic Atlas predicts extinction in the UK for the breeding Mediterranean Gull at and beyond the end of the 21st century.

4.1.70 As shown in Table 4.8 Southampton Water is not currently maintaining internationally important numbers of Mediterranean Gull (over 2,400 individuals); however it does exceed the threshold set for sites of national importance (40 individuals).

Table 4.8: WeBS Core Count data for Mediterranean Gull

Survey Area	09/10	10/11	11/12	12/13	13/14	5 yr Avg
Southampton Water	36	1,254	478	39	873	536
	14/15	**15/16**	**16/17**	**17/18**	**18/19**	**5 yr Avg**
Southampton Water	92	135	28	219	(68)	119

Teal

4.1.71 In Europe, Teal *Anas crecca* breed discontinuously from Iceland, Britain, Ireland, and France eastward to Russia. In winter, the species occurs across much of Europe, wherever there are suitable wetland habitats, including inland and coastal wetlands. Most non-breeding Teal in the UK, as elsewhere in Europe, originate from the east and north, including Iceland, Fennoscandia, and Russia. Winter flocks also contain locally breeding birds that, within Europe, are of a more sedentary or dispersive nature.

4.1.72 The GB population of Teal is estimated at 210,000 individuals (Musgrove *et al.* 2011) which represents 42% of the biogeographic population (500,000; Wetlands International 2012). Of the GB population, 35.1% (73,809; Stroud *et al.* 2016) are found within SPA sites for which this species is a qualifying feature. The species is not considered to be of conservation concern in Europe but is an Amber listed Bird of Conservation Concern in the UK due to its important non-breeding population.

4.1.73 Non-breeding Teal are widespread throughout Britain and Ireland, favouring areas of shallow water on estuarine coastal lagoons, coastal and inland marshes, and flooded pastures and ponds. They are absent only from mountainous areas, coastal stretches with high cliffs and inland areas which lack suitable freshwater habitats. Within the Solent and Southampton Water SPA, their important feeding grounds include Southampton Water and Newtown Harbour (Frost *et al.*, 2017 cited in Natural England 2018b). In Chichester Harbour, they forage in the Thorney Channel, at Snowhill Creek and at Mill Rythe / Yacht Haven. They favour Farlington Marshes in Langstone Harbour (Rowsell, MacCallum and Smith and Hughes 2017 Pers Comm cited in Natural England, 2018a).

4.1.74 This species is threatened by lowland habitat loss and degradation and by upland habitat loss due to afforestation and other land-use changes. It is also threatened by disturbance from human recreational activities and construction work. The species is susceptible to avian botulism and avian influenza so may be threatened by future outbreaks of the disease (BirdLife International 2012).

4.1.75 By 2050, under a medium emissions scenario, spring passage numbers of non-breeding Teal within SPA sites are anticipated by CHAINSPAN, with poor confidence, to increase by over 50%.

4.1.76 Southampton Water did not meet table-qualifying levels for Eurasian Teal in the WeBS counts for 2014 to 2019, as indicated by the absence of records.

Redshank

4.1.77 Redshank *Tringia totanus* have a wide, though fragmented distribution across temperate and steppe Eurasia, from Iceland in the west, through continental Europe to the Russian Far East. In Europe, Redshanks breed in nearly all countries. However, they are most abundant in the countries of eastern Europe, Britain and Ireland, Scandinavia and the Low Countries. Throughout its European distribution, the species breeds on inland and coastal wet grasslands and coastal saltmarshes.

4.1.78 The GB population of Redshank is estimated at 120,000 individuals (Musgrove *et al.* 2011) which represents approximately 43.6% of the biogeographic population (275,000; Delany *et al.* 2009; Wetlands International 2012). Of the GB population, 38.8% (46,584; Stroud *et al.* 2016) are found within SPA sites for which this species is a qualifying feature. The species is considered to be a declining species of conservation concern in Europe and is an Amber listed Bird of Conservation Concern in the UK due to the presence of an important non-breeding population and a recent decline in the breeding population.

4.1.79 Redshank breed locally across most of the UK. Highest breeding densities are found on the East Anglian and north-western coasts of England where nesting occurs on saltmarshes and on adjacent wet grassland habitats. Some of the highest breeding densities occur on machair habitats in the Western Isles of Scotland and the Inner Hebrides, as well as on low-intensity agricultural land in Orkney and Shetland and certain areas of managed coastal grassland. Redshank roost on the RSPB Islands, Farlington Marshes, Oysterbeds, Kench Spit, Kench Railway Bank, Eastney Lake Spit and on the beach on the north side of Kendalls Wharf in Langstone Harbour. In Chichester harbour, they roost at Thorney Deeps, on artificial structures such as pontoons, and at the main bird roosts such as Gutner Point, Pilsey Island and Ella Nore spit (Rowsell, MacCallum and Smith, and Hughes 2017 Pers Comm, cited in Natural England 2018a).

4.1.80 The species is threatened by the loss of breeding and wintering habitats through agricultural intensification, wetland drainage, flood control, afforestation, land reclamation, industrial development encroachment of *Spartina spp.* on mudflats, improvement of marginal grasslands, coastal barrage construction and heavy grazing. The species is also threatened by disturbance on intertidal mudflats from construction work (UK) and foot-traffic on footpaths. The species is also susceptible to avian influenza and may be threatened by future outbreaks of the virus (BirdLife International 2020).

4.1.81 By 2050, under a medium emissions scenario, spring passage numbers of non-breeding Redshank within SPA sites are anticipated by CHAINSPAN, with moderate confidence, to increase by up to 25%.

4.1.82 As shown in Table 4.9 Chichester Harbour maintains nationally important numbers of Redshank (over 940 individuals); levels for internationally significant populations are set at 2,400 individuals.

Table 4.9: WeBS Core Count data for Redshank

Survey Area	09/10	10/11	11/12	12/13	13/14	5 yr Avg
Chichester Harbour	2,028	1,873	2,137	(1,790)	1,953	1,998
	14/15	**15/16**	**16/17**	**17/18**	**18/19**	**5 yr Avg**
Chichester Harbour	2,139	(1,649)	1,595	1,728	1,686	1,787

Shelduck

4.1.83 The global range of the Shelduck *Tadorna tadorna* extends discontinuously east from western Europe, through central Asia to Iran and Pakistan. In the non-breeding season the species occurs along most of the coasts of north-west Europe, from western France to inshore Danish waters.

4.1.84 The GB population of overwintering Shelduck is estimated at 61,000 individuals (Musgrove *et al.* 2011) which represents 20.3% of the biogeographic population (Wetlands International 2012). Of the GB population, 70.4% (42,926; Stroud *et al.* 2016) are found within SPA sites for which the species is a qualifying feature. The species is not listed as a species of conservation concern in

Europe but is an Amber listed Bird of Conservation Concern in the UK due to the presence of an important, localised non-breeding population.

4.1.85 Non-breeding Shelduck in the UK are part of the north-west European population, which comprises 300,000 individuals (Wetlands International 2012). Shelduck wintering in the UK occur on most coasts. There are notable concentrations on the muddy estuaries of East Anglia, the south coast of England, the Severn Estuary, north-west England, eastern Scotland, and the east coast of Northern Ireland (Lack 1986). Shelduck roost on saltmarsh and the open water, preferably close to their feeding areas. Favoured areas in Chichester Harbour include the saltmarsh in front of Old Park Wood, Fowley Island and Thorney Deeps. They also roost on the RSPB islands in Langstone Harbour as well as at Farlington Marshes (Rowsell, MacCallum and Smith and Hughes, 2017 Pers Comm cited in Natural England 2018a).

4.1.86 The species suffers predation from American mink *Neovison vison* on islands and is susceptible to avian influenza so may be threatened by future outbreaks of the virus (BirdLife International 2012).

4.1.87 By 2050, under a medium emissions scenario, spring passage numbers of non-breeding Shelduck within SPA sites are anticipated by CHAINSPAN, with poor confidence, to increase by between 25% and 50%.

4.1.88 As shown in Table 4.10 Chichester Harbour has maintained nationally important numbers of Shelduck (over 470 individuals) for 8 of the last 10 years.

Table 4.10: WeBS Core Count data for Shelduck

Survey Area	09/10	10/11	11/12	12/13	13/14	5yr Avg
Chichester Harbour	926	638	563	696	363	637
	14/15	**15/16**	**16/17**	**17/18**	**18/19**	**5yr Avg**
Chichester Harbour	572	340	499	(656)	502	514

Eurasian Curlew

4.1.89 The breeding distribution of Curlew *Numenius arquata* is globally restricted to the temperate and boreal regions of Europe and Asia. In Europe, Curlews have an essentially northern temperate distribution, occurring in greatest numbers in Scandinavia, the Low Countries (especially The Netherlands) and in Britain and Ireland. Curlews are found around most of the coastline of Britain and Ireland in winter following their migration from Scandinavia. They also frequent extensive areas of wet grasslands such as valley floodplains.

4.1.90 The GB population of overwintering Curlew is estimated at 140,000 (Musgrove *et al.* 2011) which represents approximately 16.5% of the biogeographic population (850,000; Delany *et al.* 2009; Wetlands International 2012). Of the GB population, 32.8% (45,952; Stroud *et al.* 2016) are found within SPA sites for which this species is a qualifying feature. The species is considered to be a declining species of conservation concern in Europe and is a Red listed Bird of Conservation Concern in the UK due to a severe decline in the UK breeding population size, of more than 50%, over the longer term. These declines are due mainly to reduced breeding success, due in

particular to nest/chick predation, which may have been exacerbated by historical and ongoing agricultural changes and other impacts on breeding habitat quality, including afforestation and wind farm development (Douglas et al 2014; Brown et al 2015; Robinson et al 2016 – cited in Natural England 2019c).

4.1.91 The species breeds on upland moors, peat bogs, swampy and dry heathlands, fens, open grassy or boggy areas in forests, damp grasslands, meadows, non-intensive farmland and in river valleys. During the winter the species frequents intertidal mudflats, coastal grasslands, farmland, and (to a lesser extent) inland wetlands. It also utilises wet grassland and arable fields during migration. However, in the UK, recent severe declines in the lowlands mean that most breeding curlew are now concentrated in the uplands of northern England and Scotland. Its diet consists chiefly of annelid worms and terrestrial insects), although it will also take crustaceans, molluscs, berries and seeds, as well as occasionally small fish and amphibians.

4.1.92 Within the Chichester and Langstone Harbours SPA, Gutner Point, South Stakes, Farlington Marshes, the Oysterbeds, the RSPB islands and Kench Spit provide important roost habitat for overwintering curlew overwintering, including shingle banks, marshland and manmade structures (Rowsell, MacCallum and Smith and (Hughes, 2017 Pers Comm as cited in Natural England 2018a). As the tide rises, they congregate to feed and pre-roost in the saltmarsh close to their roost sites. Curlew will also use inland fields, both arable and grassland to roost, particularly on Hayling Island, the Bosham and Chidham Peninsulas and at West Wittering (Rowsell, 2017 Pers Comm as cited in Natural England 2018a). They forage throughout both harbours, in low densities and can be seen south of Farlington Marshes and south of Bedhampton Wharf in Langstone Harbour (Frost et al., 2017, cited in Natural England 2018a).

4.1.93 The species is threatened by the loss and fragmentation of moorland habitats as a result of afforestation and of marginal grassland habitats as a result of agricultural intensification and improvement. The species is also susceptible to avian influenza so may be threatened by future outbreaks of the virus. Wintering populations are threatened by disturbance on intertidal mudflats e.g. from construction and foot-traffic development on high-tide roosting sites, pollution and the flooding of estuarine mudflats and saltmarshes as a result of tidal barrage construction (BirdLife International 2012).

4.1.94 By 2050, under a medium emissions scenario, spring passage numbers of non-breeding Curlew within SPA sites are anticipated, with moderate confidence, to increase by between 25-50%. However, overall curlews are expected to show population declines and northwards range contractions in response to rising global temperatures. Under extreme warning (4 degrees centigrade) the southern range limit is likely to move into northern England, with the English population being restricted to upland areas from the Pennines northwards, and southern populations likely to be lost entirely (Natural England, 2019c). The increased frequency of extreme weather events such as drought and flooding could also threaten curlew populations, for instance by destroying nests on flood-prone areas (already an important cause of breeding failure in some studied populations (Brown 2015 cited in Natural England, 2019c), and by reducing food availability e.g. through the seasonal drying-out of blanket bog, or by limiting foraging opportunities.

4.1.95 The abundance of key insect food sources may be altered through climate change, although very little is known about how this is likely to impact on curlews specifically. Climate change could also bring about more subtle impacts, such as longer growing seasons leading to altered cutting and mowing dates for hay and silage, which could affect curlews through various mechanisms, including direct nest destruction, altered predation pressure and disruption to foraging opportunities (Natural England, 2019c).

4.1.96 As shown in Table 4.11 Chichester and Langstone Harbours both recorded nationally important numbers of Eurasian Curlew (over 1,400 individuals) during WeBS surveys. The levels for internationally significant populations are set at 8,400 individuals.

Table 4.11: WeBS Core Count data for Eurasian Curlew

Survey Area	09/10	10/11	11/12	12/13	13/14	5yr Avg
Chichester Harbour	1,763	1,685	1,857	1,557	1,960	1,764
Langstone Harbour	1,469	1,506	1,936	1,833	1,118	1,572
	14/15	**15/16**	**16/17**	**17/18**	**18/19**	**5yr Avg**
Chichester Harbour	1,391	1,125	1,372	1,595	1,025	1,302
Langstone Harbour	1,231	1,418	(1,018)	1,021	996	1,167

Bar-tailed Godwit

4.1.97 The Bar-tailed Godwit *Limosa lapponica* is a high-Arctic breeder, although it occurs at lower latitudes in European Russia and Scandinavia. The European winter distribution of Bar-tailed Godwits is centred on the estuaries of Britain and Ireland, as well as the coasts of the southern North Sea – especially the international Wadden Sea.

4.1.98 The GB population of Bar-tailed Godwit is estimated at 38,000 individuals (Musgrove *et al.* 2011) which represents approximately 31.7% of the biogeographic population (120,000; Stroud *et al.* 2004; Wetlands International 2012). Of the GB population, 87% (33,076: Stroud *et al.* 2016) are found within SPA sites for which this species is a qualifying feature. The species is not considered of conservation concern in Europe but is an Amber listed Bird of Conservation Concern in the UK due to the presence of important, localised non-breeding populations.

4.1.99 In Britain Bar-tailed Godwits are mostly distributed along the North Sea coast, and from northwest England to the Outer Hebrides. On passage the species may frequent inland wetlands, sandy beaches, swampy lowlands near lakes and short-grass meadows, but during the winter it is more common in intertidal areas along muddy coastlines, estuaries, inlets, mangrove-fringed lagoons and sheltered bays with tidal mudflats or sandbars.

4.1.100 At high tide, bar-tailed godwits roost on saltmarsh, freshwater and coastal grazing marsh and shingle. Roost areas within Chichester and Langstone Harbours SPA include Pilsey Island, Gutner Point and the Stakes Islands (off Cobnor Point) in Chichester Harbour and the RSPB Islands, Farlington Marshes, the Langstone Oysterbeds, Sword Sands and Kench Spit in Langstone Harbour (Hughes and Rowsell, 2017 Pers Comm, cited in Natural England 2018a).

4.1.101 Bar-tailed godwits feed throughout both harbours on intertidal sediments but show a preference for sandier substrates (Rowsell, 2017 Pers Comm). Polychaete worms can make up around 95% of their winter diet (Smith, 1975, cited in Natural England 2018a). In Chichester Harbour, their main foraging areas are at Pilsey Sands and north of Black Point and in Langstone Harbour, there is an important feeding area around Sword Sands (Frost et al., 2017, cited in Natural England 2018a).

4.1.102 The species is threatened by the degradation of foraging sites due to land reclamation, pollution and human disturbance. The species is has also been susceptible to avian influenza in the past so may be threatened by future outbreaks of the virus. In the UK there is evidence that the removal of *Spartina anglica* from tidal mudflats using a herbicide is beneficial for the species (BirdLife International 2020).

4.1.103 By 2050, under a medium emissions scenario, numbers of non-breeding Bar-tailed Godwit within SPA sites are anticipated by CHAINSPAN, with poor confidence, to decrease by up to 25%.

4.1.104 As shown in Table 4.12. Chichester Harbour is currently maintaining nationally important population numbers (500 individuals) over a five year average period 2014-2019.

Table 4.12: WeBS Core Count data for Bar-tailed Godwit

Survey Area	09/10	10/11	11/12	12/13	13/14	5yr Avg
Chichester Harbour	1,006	1,119[10]	620	903	1,159	961
	14/15	**15/16**	**16/17**	**17/18**	**18/19**	**5yr Avg**
Chichester Harbour	328	760	721	609	330	550

Shoveler

4.1.105 The Shoveler *Anas clypeata* has an extensive global distribution, breeding at northern latitudes throughout both Eurasia and North America. Those Shoveler that overwinter in Britain originate from Russia, the Baltic States, Fennoscandia and Iceland, and are widely distributed across central and southern England. In north-west and south-west England they are more localised as suitable habitat is less widespread. Shovelers inhabit reservoirs, natural lakes, flooded mineral workings, coastal wetlands and flooded grasslands.

4.1.106 The GB population of overwintering Shoveler is estimated at 18,000 individuals (Musgrove *et al.* 2011) which represents approximately 45% of the biogeographic population (40,000; Wetlands International 2012). Of the GB population, 25.9% (4,659; Stroud *et al.* 2016) are found within SPA sites for which this species is a qualifying feature. The species is considered to be a declining species of conservation concern in Europe and is an Amber listed Bird of Conservation Concern in the UK due to the presence of important non-breeding populations.

4.1.107 Within Britain the breeding strongholds are the Norfolk Broads, the north Kent Marshes and the East Anglian fens, with birds widely scattered elsewhere in eastern and central England, becoming scarcer in upland areas and the south-west. In Scotland, birds breed in lowland areas between the Forth and the Grampians, as well as on the lochs of the Uists, Tiree and Orkney.

They inhabit freshwater wetlands, typically nesting in sparse cover near to shallow eutrophic still waters. In 1989/90 non-breeding birds were split between the following habitat types: 17– 39% on reservoirs, 18–30% on natural lakes, 13–23% on flooded mineral workings, 7–22% on coastal wetlands and 6–19% on flooded grasslands (Kirby & Mitchell 1993).

4.1.108 The species is threatened by habitat loss in Britain and Ireland, is occasionally killed by collisions with power transmission lines and suffers from nest predation by American mink *Neovison vison*. It is also susceptible to avian influenza and avian botulism so may be threatened by future outbreaks of these diseases (BirdLife International 2020).

4.1.109 Shoveler were not included in Climatic Atlas or modelled by CHAINSPAN. However, as for other overwintering bird species, the Shoveler is expected to experience a decrease in its summer range and an extension of its northern range extension in the winter as a result of climate change. There is evidence of advanced spring migration in Shoveler and other duck species, increasing the risk of disconnection between the peak of food availability and the timing of hatching, which may dramatically affect breeding success (Guillemain *et al.*, 2013).

4.1.110 None of the four survey areas met mean table-qualifying levels for Shoveler in the WeBS counts for 2014 to 2019, as indicated by the absence of records. These are set at 650 individuals for a site of international importance and 190 individuals for a site of national importance.

Pintail

4.1.111 Pintail *Anas acuta* has a widespread global distribution across North America and north Eurasia, breeding mainly in tundra and taiga zones. In Europe, as in the UK, Pintail is a rare breeding bird, occurring in a few suitable wetland areas. Most birds occurring in winter migrate from more northern and eastern breeding areas in Fennoscandia and Russia.

4.1.112 The GB population of Pintail is estimated at 29,000 individuals (Musgrove *et al.* 2011), representing approximately 48.3% of the biogeographic population (60,000; Wetlands International 2012). Of the GB population, 58.2% (16,883; Stroud *et al.* 2016) are found within SPA sites for which this species is a qualifying feature. The species is a declining species of conservation concern in Europe but is an Amber listed Bird of Conservation Concern in the UK due to the presence of a small breeding population and an important, localised non-breeding population.

4.1.113 Pintail concentrate in large numbers at a small number of sites, much more so than many other non-breeding ducks. Indeed, half the north-west European population is confined to just thirteen sites, along North Sea, Irish Sea and Atlantic coasts. Principal sites in the UK are estuaries in north-west England and north Wales, which hold three times the non-breeding numbers occurring in east-central England, the second most important area.

4.1.114 Pintail are extremely mobile during the winter, taking advantage of habitats which are only temporarily available through flooding. This mobility causes local changes in distribution and changes to the relative importance of individual sites through the winter. Numbers of birds at individual sites in the UK and the Republic of Ireland also fluctuate markedly between years indicating a low degree of site fidelity.

4.1.115 The species is threatened by wetland habitat loss on its breeding and wintering grounds and reclamation of coastal areas for industrial development poses a threat in Europe. The species is predated by rats *Rattus norvegicus* on islands and is susceptible to avian botulism and avian influenza so may be threatened by future outbreaks of these diseases (BirdLife International 2020).

4.1.116 By 2050, under a medium emissions scenario, numbers of non-breeding Pintail are anticipated by CHAINSPAN, with poor confidence, to increase by up to 25%.

4.1.117 As shown in Table 4.13, the five year average count of Pintail for Chichester Harbour WeBS survey area exceeds the threshold for nationally important numbers of individuals (200). Langstone Harbour falls just below this threshold although counts from 2018/2019 do exceed 200 individuals.

Table 4.13: WeBS Core Count data for Pintail

Survey Area	09/10	10/11	11/12	12/13	13/14	5yr Avg
Chichester Harbour	(188)	268[10]	283	193	220	241
Langstone Harbour	103	219	197	118	112	150
	14/15	**15/16**	**16/17**	**17/18**	**18/19**	**5yr Avg**
Chichester Harbour	283	221	209	204	346	253
Langstone Harbour	133	121	277[10]	228	233	198

Sanderling

4.1.118 The Sanderling *Calidris alba* is a very high Arctic breeding wader with a circumpolar breeding distribution. The birds that winter in western Europe are thought to mostly originate from Siberia. The European distribution of the Sanderling in winter extends from the Atlantic coast of Judtland, along the northern and western coasts of France and Iberia as well as Britain and Ireland.

4.1.119 The GB population of Sanderling is estimated at 16,000 individuals (Musgrove *et al.* 2011), representing 13.3% of the biogeographic population (120,000; Delany *et al.* 2009; Wetlands International 2012). Of the GB population, 61.9% (9,896; Stroud et al. 2016) are found within SPA sites for which the species is a qualifying feature. The species is not considered to be of conservation concern in Europe but is an Amber listed Bird of Conservation Concern in the UK due to

4.1.120 Sanderlings overwinter on estuaries and open coasts all around the UK with large concentrations in north-west England and the Outer Hebrides. The species is characteristic of open sandy shores and may move regularly within winter to exploit fluctuating food resources.

4.1.121 The species is sensitive to disturbance on beaches from recreational activities and free-running dogs and is susceptible to avian influenza so my be threatened by future outbreaks of the virus (BirdLife International 2012).

4.1.122 By 2050, under a medium emissions scenario, wintering numbers of non-breeding Sanderling within SPA sites are anticipated by CHAINSPAN, with moderate confidence, to increase by over 50% and autumn passage numbers are anticipated, with low confidence, to decline by up to 25%.

4.1.123 As shown in Table 4.14 Chichester Harbour was the only site where nationally important numbers of Sanderling (set at over 200individuals) were recorded. The levels for internationally significant populations are set at 2,000 individuals.

Table 4.14: WeBS Core Count data for Sanderling

Survey Area	09/10	10/11	11/12	12/13	13/14	5yr Avg
Chichester Harbour	329	350	450	350	606	417
	14/15	**15/16**	**16/17**	**17/18**	**18/19**	**5yr Avg**
Chichester Harbour	404	148	106	258[10]	176	218

Turnstone

4.1.124 The Turnstone *Arenaria interpres* has a circumpolar breeding distribution. Through much of its range, the species is a high-Arctic breeder, occurring in the northernmost parts of Greenland, Russia and Canada.

4.1.125 The GB population of Turnstone is estimated at 48,000 (Musgrove *et al.* 2011), representing approximately 32% of the biogeographic population (150,000; Delany *et al.* 2009; Wetlands International 2012). Of the GB population, 10.2% (4,917; Stroud *et al.* 2016) are found within SPA sites for which the species is a qualifying feature. The species is not considered to be of conservation concern in Europe but is an Amber listed Bird of Conservation Concern in the UK due to the presence of an important non-breeding population.

4.1.126 The UK wintering total is a component of the Western Palearctic wintering population, which comprises 67,000 individuals. The UK non-breeding distribution includes the entire coastline of the UK, with concentrations on the coast of north-east England, the estuaries of north-west England, the north Kent coast, the east coast of Scotland, the Outer Hebrides, Orkney, and the east coast of Northern Ireland The preferred non-breeding habitat is shores that are rocky, stony, or covered with seaweed.

4.1.127 The species suffers nest predation from feral American mink *Neovison vison* in some regions and is susceptible to avian influenza so may be threatened by future outbreaks of the virus (BirdLife International 2012).

4.1.128 Turnstone were not included in the Climatic Atlas or modelled by CHAINSPAN.

4.1.129 As shown in Table 4.15 Langstone Harbour did not meet table-qualifying levels for nationally important numbers of Turnstone in the WeBS counts (set at 400 individuals), with the exception of the 2010 to 2011 and 2015 to 2016 recording periods. The survey area at Chichester Harbour did not meet table-qualifying levels.

Table 4.15: WeBS Core Count data for Turnstone

Survey Area	09/10	10/11	11/12	12/13	13/14	5yr Avg
Langstone Harbour	299	415	218	267	303	300
	14/15	**15/16**	**16/17**	**17/18**	**18/19**	**5yr Avg**
Langstone Harbour	389	486	328	254	186	329

Wigeon

4.1.130 The global distribution of the Wigeon *Anas penelope* extends from Iceland in the west, across Eurasia to the coasts of the Bering Sea and the Sea of Okhotsk. The species is a boreal breeder, occurring throughout the extensive Russian taigas where it is the most abundant of the dabbling ducks.

4.1.131 In the UK, Wigeon breed sparsely throughout much of eastern England, becoming more widely distributed in the uplands of northern England, central Scotland, the northern Scottish bogs and the Northern Isles. Over 75% of the UK population breeds in Scotland, and the species' range may be limited by water quality (with a preference for neutral or alkaline waters), and availability of suitable nesting sites.

4.1.132 The GB population of overwintering Wigeon is estimated at 440,000 individuals (Musgrove *et al.* 2011), representing approximately 29.3% of the biogeographic population (1,500,000; Wetlands International 2012). Of the GB population, 53.9% (237,336; Stroud *et al.* 2016) are found within SPA sites for which this species is a qualifying feature. It is also estimated that 300 pairs of Wigeon are resent in the UK (Sharrock 1976), representing only 0.06% of the biogeographic population (500,000; Wetlands International 2012). Of the GB population, 20% (60; Stroud et al. 2016) are found within SPA sites for which this species is a qualifying feature. The species is not considered as a species of conservation concern in Europe but is an Amber listed Bird of Conservation Concern in the UK due to the presence of important and localised non-breeding population in the UK.

4.1.133 In winter, Wigeon are highly gregarious, and occur in large, mobile flocks that rapidly move to other areas should conditions change for the worse. Wigeon is largely a coastal species, feeding on mud-flats, coastal flooded grassland and saltmarsh pastures. In the UK, the species is also widespread on inland flooded grassland. The use of inland sites appears to have increased in recent years, as birds have adapted their feeding habits in response to changes in the availability of food, as well as the conservation management of key floodplain and other wetlands.

4.1.134 This species is susceptible to disturbance from freshwater recreational activities (e.g. tourists walking), pollution, wetland drainage and changing wetland management practices (decreased grazing and mowing in meadows leading to scrub over-growth). Avian influenza is also a potential threat (BirdLife International 2020).

4.1.135 By 2050, under a medium emissions scenario, numbers of non-breeding Wigeon within SPA sites are anticipated by CHAINSPAN, with poor confidence to decrease by up to 25%.

4.1.136 Chichester and Langstone Harbours WeBS survey areas did not meet mean average table-qualifying levels for Wigeon in the WeBS counts for 2009 to 2014 and 2014 to 2019 as indicated

by the absence of records. These are set at 14,000 individuals for a site of international importance and 4,500 individuals for a site of national importance.

Nightjar

4.1.137 The Nightjar's *Caprimulgus europaeus* global distribution lies in the Palearctic where it breeds from North Africa and western Europe, widely across temperate regions of Eurasia as far as central Asia and western China.

4.1.138 In the UK, Ireland and central Europe its distribution tends to be sporadic, reflecting the scattered availability of good breeding habitats (Cramp 1985; Hagemeijer & Blair 1997). Nightjars breeding in the UK are concentrated in southern and south-eastern England and East Anglia, with much smaller numbers and lower densities occurring in Wales, the Midlands, north-east England and south-west Scotland. There may be less than 30 pairs throughout the whole of Ireland.

4.1.139 The GB breeding population of Nightjar is estimated to be 4,600 pairs (Conway *et al.* 2007) which represents 2.3% of the biogeographic population (202,000; Cramp 1985; BirdLife International 2004). Of the GB population, 46.2% (2,124 pairs; Stroud *et al.* 2016) are found within SPA sites for which this species is a qualifying feature. The species is of conservation concern in Europe, but has moved from Red to an Amber listed Bird of Conservation Concern in the UK due to a recent moderate decline in breeding range (>25% and <50%) between 1968-71 and 2007-11.

4.1.140 Nightjar breeding habitats include heathland, often with scattered pine or birch, woodland edges and clearings, young forestry plantations and, particularly in south-east England, coppiced woodland. Forestry plantations are used up to 15–20 years after planting. In clear-felled areas of Thetford Forest, nests have been found in a variety of habitats, including extensive, non-vegetated areas and sparse bracken. Birds forage over a variety of habitats including deciduous or mixed woods, orchards, gardens, riparian habitats and freshwater wetlands, heathland and young plantations.

4.1.141 The main threats to this species are the reduction in insect availability due to pesticide use as well as habitat loss or degradation generally caused by grazing on heathlands and pastoral woodlands and conversion of habitats to agricultural lands, vineyards, commercial forestry and urban areas. Disturbance from recreational use of heathlands and road deaths may also contribute to its decline. The species also has numerous predators, especially of eggs and chicks, including domestic dogs. Nitrogenous pollutants in rain may lead to eutrophication of dry-land breeding areas and unsuitable vegetation structure. Climate change may affect the species' geographic range in the future (BirdLife International 2012).

4.1.142 The National Nightjar Survey recorded 781 churring males in Hampshire in 2004. This represents a 52% increase in numbers for the county since the previous survey was carried out in1992 (BTO 2004). Table 4.16 shows the percentage of Nightjars which are supported by the New Forest SPA in the 2000s compared to the 1990s. The 2018 New Forest Nightjar survey recorded a breeding population of 435 in 2018 which represents 9.3% of the British population. This is a reduction of 109 from 544 in 2013 (Jackson 2018).

Table 4.16: Distribution of Nightjars within SPA in Britain (Stroud et al., 2016)

Site Name	Site Total 1990s	Site Total 2000s
Ashdown Forest	35	85
Breckland	415	349
Dorset Heathland	386	438
East Devon Heaths	83	58
Minsmere – Walberswick	24	39
New Forest	300	667
Sandlings	109	81
Thames Basin Heaths	264	301
Thorne and Hatfield Moors	66	39
Wealden Heaths	103	67

Woodlark

4.1.143 Woodlark *Lullula arborea* is widely distributed across Europe from Iberia to the Russian steppes but has a generally southern distribution, occurring only in the southernmost parts of Scandinavia and Britain. In the UK, breeding is confined to southern England with most birds occurring in Dorset, Hampshire (especially the New Forest), Surrey, Sussex, Breckland and the Suffolk Coast.

4.1.144 The GB population of breeding Woodlark is estimated at 3,100 pairs (Conway *et al.* 2009) which represents 0.2% of the biogeographic population (1,556,000; Cramp 1985; BirdLife International 2004). Of the GB population, 31% (960 pairs; Stroud *et al.* 2016) are found within SPA sites for which this species is a qualifying feature. The species is not considered as a species of conservation concern in Europe and is a Green listed Bird of Conservation Concern in the UK.

4.1.145 Favoured breeding habitat is dependent on location, with birds in the south west using agricultural land, whilst those in the south are typically found on heathland such as that present in the New Forest. Migratory behaviour also varies across the species' English distribution. East Anglian birds largely desert their breeding grounds in the winter, although a greater proportion of the birds in southern England remain on breeding areas throughout the year.

4.1.146 The main threat to this species is habitat loss and degradation which in northern Europe is being lost to agricultural intensification and afforestation. Winter weather can also cause fluctuations in population numbers (BirdLife International 2012). Within the New Forest SPA, inappropriate scrub control and land management, atmospheric nitrogen deposition, public disturbance also threaten this species (Natural England, 2014).

4.1.147 The Climatic Atlas predicts a wide distribution of Woodlark across southern areas of the UK at and beyond the end of the 21st century. By 2050, under a medium emissions scenario, numbers of Woodlark within SPA sites are anticipated, with moderate confidence, to increase by at least 50%.

4.1.148 Table 4.17 shows the percentage of Woodlarks which are supported by the New Forest SPA in the 2000s compared to the 1990s.

Table 4.17: Distribution of Woodlarks within SPA in Britain (Stroud et al., 2016)

Site Name	Site Total 1990s	Site Total 2000s
Breckland	430	365
Dorset Heathland	60	78
Minsmere – Walberswick	20	30
New Forest	184	163
Sandlings	154	73
Thames Basin Heaths	149	200
Wealden Heaths	105	51

Honey Buzzard

4.1.149 The global breeding distribution of the Honey Buzzard *Pernis apivorus* is largely restricted to the Western Palearctic. The UK is at the edge of the European breeding range and the species has probably always been a rare, but scattered breeder.

4.1.150 The GB population of breeding Honey Buzzard is estimated at 33 pairs (Batten 2001; Ogilvie 2003), representing only 0.05% of the biogeographic population (64,000; BirdLife International 2004). Of the GB population, 12.1% (4 pairs; Stroud *et al.* 2016) are found within SPA sites for which this species is a qualifying feature. The species is not considered of conservation concern in Europe, but is an Amber listed Bird of Conservation Concern in the UK due to its small breeding population.

4.1.151 In the UK, Honey Buzzards occur in three broad habitat types: high-quality mixed deciduous forests in the lowlands of southern England, central hill country with mixed farmland/woodland, and upland, even-aged coniferous plantations. These habitats are also preferred elsewhere in Europe. Beech *Fagus sp.* forests with sandy, light soils have been favoured in the New Forest, traditionally regarded as the species stronghold, largely thought to be due to the association of this habitat with an abundance of social wasps on which the species selectively feeds its young. However, breeding performance is not adversely affected by the temporary unavailability of wasps, as amphibians, and pigeon and passerine nestlings are taken in inclement weather.

4.1.152 Population declines in northern Europe have resulted from deforestation, forest conversion and shooting. Human disturbance is also a threat. The species is very highly vulnerable to the effects of potential wind energy development (BirdLife International 2012). Within the New Forest SPA, atmospheric nitrogen deposition and public disturbance also threaten this species (Natural England, 2014).

4.1.153 The Climatic Atlas predicts an expanded distribution of Honey Buzzards over the southern half the UK at and beyond the end of the 21st century.

4.1.154 Table 4.18 shows the percentage of Honey Buzzards which are supported by the New Forest SPA in the 2000s compared to the 1990s.

Table 4.18: Distribution of Honey Buzzards within SPA in Britain (Stroud et al., 2016)

Site Name	Site Total 1990s	Site Total 2000s
New Forest	2	4

Dartford Warbler

4.1.155 The global breeding range of the Dartford Warbler *Sylvia undata* is largely restricted to the western part of the Mediterranean region and almost the entire world population breeds in Europe, with more than 75% thought to breed in Spain and large numbers also occurring in southern and western France, southern Italy and Portugal. Southern England is at the northern limit of the species world range. Here the main concentrations occur in Dorset, Hampshire and Surrey with smaller numbers in the south west and East Anglia.

4.1.156 The GB population of breeding Dartford Warbler is estimated at 3,200 pairs (Wotton *et al.* 2009), representing 0.5% of the biogeographic population (654,000; BirdLife International 2004). Of the GB population, 51.7% (1,654 pairs; Stroud *et al.* 2016) are found within SPA sites for which this species is a qualifying feature. The species is depleted in Europe and considered of most conservation concern; it is an Amber listed Bird of Conservation Concern in the UK due to its localised breeding population.

4.1.157 In Britain, the species is almost exclusively found on lowland dry heathland with Heather *Calluna vulgaris* and Gorse *Ulex spp*. Large areas of heathland typically hold higher densities of breeding birds than fragmented and isolated habitats, with up to 10-15 pairs/km2 present in the best areas. Territories containing Gorse *Ulex spp*. tend to be more productive (Catchpole & Phillips 1992), most likely due to the greater abundance of invertebrate prey and increased shelter during the winter. Birds generally remain on the breeding grounds throughout the year, although there is a partial migration of adults, notably in October.

4.1.158 In the UK the population was reduced to 11 pairs after the severe winter of 1962-1963 and again significantly reduced in 2008 and 2010 following two cold winters. Current and future climate change is expected to alter the species distribution in the north of its range. There is also evidence to show that the species is adversely affected by disturbance from people and dogs, particularly when nesting in heather (BirdLife International 2012; Murison *et al.*, 2007, cited in Natural England, 2019c). Its sensitivity to human disturbance may also be important if warmer summers lead to increased recreational use of their breeding grounds.

4.1.159 The Dartford warbler is vulnerable to the loss or degradation of habitat due to wildfire and inappropriate fire management regimes (Regos *et al.*, 2015, cited in Natural England, 2019c). The species is also sensitive to the impact of drought impacting the food supply of juveniles (Bibby 1979b, cited in Natural England, 2019c); a threat likely to become more prevalent, especially on sites in the south and east of England. Within the New Forest SPA atmospheric

nitrogen deposition and inappropriate land management also threaten this species (Natural England, 2014).

4.1.160 The Climatic Atlas predicts a wide distribution of Dartford Warbler across the southern half of the UK. By 2050, under a medium emissions scenario, numbers of Dartford Warbler within SPA sites is anticipated by CHAINSPAN, with moderate confidence, to increase by at least 50%.

4.1.161 Table 4.19 shows the percentage of Dartford Warblers which are supported by the New Forest SPA in the 2000s compared to the 1990s.

Table 4.19: Distribution of Dartford Warblers within SPA in Britain (Stroud et al., 2016)

Site Name	Site Total 1990s	Site Total 2000s
Ashdown Forest	29	38
Dorset Heathland	418	613
East Devon Heathlands	128	69
New Forest	538	419
Thames Basin Heaths	445	376
Wealden Heaths	123	139

Hen Harrier

4.1.162 Hen Harriers *Circus cyaneus* have a widespread global distribution. In the Palearctic, migrants winter in southern parts of Europe, the Middle East and through southern areas of central and eastern Asia, although hen harriers breeding in Europe tend to be more sedentary. In the UK, breeding is now confined to Northern Ireland, and northern and western Britain, especially Scotland.

4.1.163 The winter distribution of Hen Harriers in the UK significantly differs from that during the breeding season. In autumn, birds disperse from many moorland nesting areas and move to winter in lowlands, especially around the coast. There are significant concentrations on the south and east coast of England, especially within the East Anglia estuaries, the Greater Thames estuary and Solent area.

4.1.164 The GB population of non-breeding Hen Harrier is estimated at 1,710 individuals (Holling *et al.* 2012), representing approximately 3.7% of the biogeographic population (46,500; BirdLife International 2004). Of the GB population, 14.6% (249; Stroud *et al.* 2016) are found within SPA sites for which this species is a qualifying feature. The New Forest population is considered to be non-breeding. The species is considered a depleted species of most conservation concern in Europe and is a Red listed Bird of Conservation Concern in the UK due to historical population decline.

4.1.165 Hen Harriers hunt especially over salt-marshes taking small passerines, small mammals and waders. Hen Harriers also occur in lowland heaths and on chalk downland, with significant winter concentrations in Hampshire and Dorset, on downland in Oxfordshire, Berkshire and

Wiltshire, as well as in the East Anglia Brecks. During winter, Hen Harriers gather at communal roost sites at night. These can hold significant numbers of individuals (sometimes over 20) and are usually located in wetlands such as carr woodland, marshes and reedbeds, although they sometimes occur on heather moorland, lowland heath and conifer plantations.

4.1.166 The main threat to this species is the transformation of habitat owning to intensified agriculture, disappearance of marshes and reafforestation. Persecution is severe locally, for example on managed grouse moors of Scotland and in 2013 not a single pair successfully nested in England despite the fact that there is estimated habitat to accommodate more than 300 pairs (BirdLife International 2012). Within the New Forest SPA atmospheric nitrogen deposition also threatens this species (Natural England, 2014).

4.1.167 Hen Harrier were not included in Climatic Atlas or modelled by CHAINSPAN.

4.1.168 Table 4.20 shows the percentage of Hen Harriers which are supported by the New Forest SPA in the 2000s compared to the 1990s.

Table 4.20: Distribution of Non-Breeding Hen Harriers within SPA in Britain (Stroud et al., 2016)

Site Name	Site Total 1990s	Site Total 2000s
Blackwater Estuary	4	4
Broadland	22	22
Colne Estuary	4	4
Dengie	5	5
Dorset Heathlands	20	20
Foulness	6	6
Humber Flats, Marshes & Coast	20	20
Loch of Inch and Torrs Warren	8	8
Minsmere - Walberswick	15	15
Muirkirk & North Lowther Uplands	10	4
New Forest	15	15
North Norfolk Coast	16	16
Orkney Mainland Moors	13	31

Hobby

4.1.169 The Hobby *Falco Subbuteo* is a migratory species with western birds wintering in Africa and others in southern Asia (del Hoyo et al. 1994). Birds leave their breeding grounds between August and October, arriving at wintering quarters from late October onwards. The return journey begins in March and April, and breeding territories are occupied again in May and June (BirdLife International, 2020a). The species is a Green listed Bird of Conservation Concern in the UK.

4.1.170 Hobbies almost always nest in trees, using abandoned nests of other raptors or corvids (del Hoyo *et al.* 1994). Hobbies prefer to hunt over open, damp ground, especially in spring because their favoured food at that time of year is dragonflies (NFNPA, 2020).

4.1.171 The New Forest is a stronghold for hobbies in Hampshire, and the heathlands and wet river valleys of southern England are where the majority of hobbies occur. They are widespread but uncommon in most of England and are mostly absent from Wales and Scotland (NFNPA, 2020).

4.1.172 Within the New Forest SPA the species is threatened by public disturbance and atmospheric nitrogen deposition (Natural England, 2014).

Wood Warbler

4.1.173 The Wood Warbler *Phylloscopus sibilatrix* is a migratory species overwintering in sub-Saharan Africa and returning to their breeding grounds from May to July. As the name suggests, wood warblers are woodland inhabitants, most at home amongst broad-leaved trees and, in particular, oaks and beeches of the New Forest's ancient, unenclosed woodlands. This species breeds in lowlands, in moist and shady deciduous woods, with closed canopy and sparse undergrowth (BirdLife International, 2020b).

4.1.174 The species is a Red listed Bird of Conservation Concern in the UK due to severe breeding population decline in the UK (>50%) over 25 years. Within the New Forest SPA the species is threatened by public disturbance and atmospheric nitrogen deposition (Natural England, 2014).

4.2 Qualifying Species of Special Areas of Conservation

4.2.1 The following summaries have been adapted from the descriptions published by the Joint Nature Conservancy Committee[11] together with Natural England's Supplementary Advice on Conserving and Restoring Site Features[12] and a review of other available literature on the behaviour and ecology of these species.

Southern Damselfly

4.2.2 The southern damselfly is a small, weak flying damselfly – a relative of the dragonflies. It is at the northern edge of its global range in the UK, which is reflected in its southern and western distribution and in the narrow range of habitat types in which it occurs in the UK (Purse, 2002; Rouquette, 2005). These are found in two distinct landscape types: base-rich lowland heathland and calcareous streams and fens (Rouquette, 2005). The former is characterised by the heathland streams and valley mires found in the New Forest and Preseli Hills and the latter most commonly by the historic water meadow systems associated with the rivers Itchen and Test in Hampshire.

4.2.3 The Southern Damselfly *Coenagrion mercuriale* has very specialised habitat requirements, being confined to shallow, well-vegetated, base-rich runnels and flushes in open areas or small

[11] http://jncc.defra.gov.uk/ProtectedSites/SACselection/SAC_species.asp

[12] http://publications.naturalengland.org.uk/category/6528471664689152

side-channels of chalk rivers. Most sites are on wet heath. The larvae live in flushes and shallow runnels, often less than 10cm deep, with slow-flowing water. Adults fly from June to August. Females lay eggs onto submerged plants, and the predatory aquatic larvae probably take two years to mature.

4.2.4 Strong populations of southern damselfly occur in the River Itchen SAC, estimated to be in the thousands of individuals. The site in central southern England represents one of the major population centres in the UK. It also represents a population in a managed chalk-river flood plain, an unusual habitat for this species in the UK, rather than on heathland.

4.2.5 The New Forest SAC in central southern England is an outstanding locality for Southern Damselfly, with several population centres and strong populations estimated to be in the hundreds or thousands of individuals. The heathland habitat on which it occurs is more typical for the species.

4.2.6 Climate change is driving increases in river temperatures which will create stress for a range of characteristic riverine species (Natural England, 2019a). However, given that the southern damselfly is living on the extreme northern edge of its global range in the UK, the species is unlikely to be affected by increasing river and air temperatures associated with climate change. The primary impact of climate change on this species will be through changes to the hydrology of a site (Natural England, 2019a).

Stag Beetle

4.2.7 The stag beetle *Lucanus cervus* is the UK's largest terrestrial beetle, and amongst the most spectacular, reaching 7cm in length. Larvae develop in decaying tree stumps and fallen timber of broad-leaved trees in contact with the ground, especially of apple *Malus spp.*, elm *Ulmus spp.*, lime *Tilia spp.*, beech *Fagus sylvatica* and oak *Quercus spp*. Such timber is an essential feature for conservation of structure and function of the habitat for this species.

4.2.8 Development takes around 3-4 years. Adults are active on warm evenings, but probably only the males fly regularly and come readily to lights. Adults have been recorded from May to September or even October, though they are most abundant in early summer.

4.2.9 The New Forest represents stag beetle in its Hampshire/Sussex population centre, and is a major stronghold for the species in the UK. The forest is one of the most important sites in the UK for fauna associated with rotting wood, and was identified as of potential international importance for its saproxylic invertebrate fauna by the Council of Europe (Speight 1989).

4.2.10 The overall vulnerability of the habitats supporting the stag beetle within the New Forest SAC to climate change has been assessed by Natural England as moderate (Natural England, 2019b) taking into account the sensitivity, fragmentation, topography and management of its habitats.

Great Crested Newt

4.2.11 The Great Crested Newt *Triturus cristatus* is the largest native British newt, reaching up to around 17cm length. Adult males have jagged crests running along the body and tail. Newts require aquatic habitats for breeding. Eggs are laid singly on pond vegetation in spring, and

larvae develop over summer to emerge in August – October, normally taking 2–4 years to reach maturity. Juveniles spend most time on land, and all terrestrial phases may range a considerable distance from breeding sites.

4.2.12 The Great Crested Newt is widespread throughout much of England and Wales, but occurs only sparsely in south-west England, mid Wales and Scotland. It is absent from Northern Ireland. The total UK population is relatively large and is distributed over sites that vary greatly in their ecological character. One estimate has put the national population at around 400,000 animals in 18,000 breeding sites. Many of the largest populations are centred on disused mineral-extraction sites, but lowland farmland forms the majority of great crested newt habitat in the UK.

4.2.13 Approximately 45 breeding populations are known within Hampshire, and these are concentrated along the south coast and eastern border of the county. Although the New Forest ponds are relatively well known, a comprehensive survey of ponds and their species has never been carried out across most of Hampshire. Thus, further populations may exist elsewhere (Hampshire Biodiversity Partnership, 2000).

4.2.14 Milder winters associated with climate change may reduce the viability of newt populations with mild and wet winters associated with lower survival rates as a result of waterlogged soils or depletion of individual energy reserves during the hibernation period. Hot dry summers have been shown to have an adverse impact on populations, reducing the availability of aquatic habitat and prey. Extreme rainfall events leading to an increased incidence of pollution could also adversely impact local population viability (Natural England, 2019c).

4.2.15 The overall vulnerability of the New Forest SAC to climate change has been assessed by Natural England as moderate taking into account the sensitivity, fragmentation, topography and management of its habitats (Natural England, 2019b). Changes in habitat location, size and quality may impact on the species' survival.

Bullhead

4.2.16 The bullhead *Cottus gobio* is a small bottom-living fish that inhabits a variety of rivers, streams and stony lakes. It appears to favour fast-flowing, clear shallow water with a hard substrate (gravel/cobble/pebble) and is frequently found in the headwaters of upland streams. However, it also occurs in lowland situations on softer substrates so long as the water is well-oxygenated and there is sufficient cover. It is not found in badly polluted rivers.

4.2.17 The Itchen is a classic chalk river that supports high densities of bullhead throughout much of its length. The river provides good water quality, extensive beds of submerged plants that act as a refuge for the species, and coarse sediments that are vital for spawning and juvenile development.

4.2.18 Bullheads spawn from February to June and up to four times. The male excavates a nest under a suitable large stone to attract a female. Part of this may be achieved by emission of acoustic 'knocking' sounds by the males. The female lays a batch of up to 400 eggs (2–2.5 mm in diameter), which adhere to the underside of the stone. In situations without suitable stones,

bullheads may use other media, such as woody material or tree roots. The male then defends the brood against egg predators such as caddis larvae and manages the nest by fanning the eggs with his pectoral fins. The eggs hatch after 20 to 30 days, depending on water temperature. The newly hatched larvae (6–7mm in length) are supplied by a large yolk sac, which is absorbed after 10 days, after this time they leave the nest.

4.2.19 Generally, bullheads attain a length of 40–50 mm after their first year, 60 mm after their second and 70– 90 mm after their third. They do not generally live for more than three or four years, although fish of over 10 years old have been recorded

4.2.20 Climate change is driving increases in river temperatures which will create stress for a range of characteristic riverine species, particularly those on the southern limit of their range which is not the case for bullhead whose range extends south into southern Europe. The overall vulnerability of the River Itchen SAC to climate change has been assessed by Natural England as being high, taking into account the sensitivity, fragmentation, topography and management of its habitats and supporting habitats (Natural England, 2019a).

White-clawed Crayfish

4.2.21 The white-clawed crayfish *Austropotamobius pallipes* (also known as the Atlantic Stream Crayfish), lives in a diverse variety of clean aquatic habitats but especially favours hard-water streams and rivers.

4.2.22 In Britain the most significant threats to the survival of this species are posed by non-native crayfish species such as the North American Signal Crayfish *Pacifastacus leniusculus*, which out-competes, White-clawed crayfish and by crayfish plague Crayfish plague which can be introduced into a waterbody by entry of signal crayfish and also by water, fish or equipment that has been in contact with signals.

4.2.23 White-clawed crayfish can grow up to 12cms long and live in rivers and streams about 1 metre deep where they hide in rocks and submerged wood. They can live up to 12 years and they usually have their first young when they are 3 years old. Females carry their eggs for 7-9 months until they hatch, once hatched the young hitch-hike on their mothers for a further 2 weeks. There appear to be differences in life history between northern and southern populations, for example crayfish in the Itchen are thought to hold young for a shorter time than in more northern populations.

4.2.24 In Hampshire there are few records prior to the 1980s. The River Itchen, formerly believed to be a stronghold for the species, was still supporting white-clawed crayfish along much of its length up until the mid- 1990s. However, the future of this species in Hampshire is very uncertain; it is believed to be critically endangered and is unlikely to survive in the county unless factors responsible for its decline can be addressed (Hampshire Biodiversity Partnership, 2000).

4.2.25 Climate change is driving increases in river temperatures which will create stress for a range of characteristic riverine species, particularly those on the southern limit of their range which is not the case for white-clawed crayfish whose range extends south to southern Europe. The overall vulnerability of the River Itchen SAC to climate change has been assessed by Natural England

as being high, taking into account the sensitivity, fragmentation, topography and management of its habitats and supporting habitats (Natural England, 2019a).

Brook Lamprey

4.2.26 The Brook Lamprey *Lampetra planeri* is a primitive, jawless fish resembling an eel, and is the smallest of the lampreys found in the UK. It is a non-migratory freshwater species, occurring in streams and occasionally in lakes in north-west Europe. Like other lamprey species, the brook lamprey requires clean gravel beds for spawning and soft marginal silt or sand for the larvae. It spawns mostly in parts of the river where the current is not too strong.

4.2.27 The brook lamprey has declined in parts of the UK, although it is still widespread. This species is the most abundant and widespread of the British lampreys and is often found in the absence of the other two species, for example above a barrier that precludes the presence of the migratory species.

4.2.28 The River Itchen is an extensive river systems, including important tributaries, which provides conservation of the range of habitat features, such as suitable areas of gravels, silt or sand required for spawning, required by the species.

4.2.29 Climate change is driving increases in river temperatures which will create stress for a range of characteristic riverine species, particularly those on the southern limit of their range which is not the case for brook lamprey whose range extends south to central Europe. The overall vulnerability of the River Itchen SAC to climate change has been assessed by Natural England as being high, taking into account the sensitivity, fragmentation, topography and management of its habitats and supporting habitats (Natural England, 2019a).

Otter

4.2.30 Otters are semi aquatic, living mainly along rivers. They mainly eat fish, though crustaceans, frogs, voles and aquatic birds may also be taken. Being at the top of the food chain, an otter needs to eat up to 15% of its body weight in fish daily.

4.2.31 Otters are solitary shy animals, usually active at dusk and during the night. Otters can travel widely over large areas. Some are known to use 20 km or more of river habitat. Otters tend to live alone as they are very territorial. Otters deposit faeces in prominent places along a watercourse (known as spraints) which have a characteristic sweet musky odour. These mark their range which may help neighbouring animals keep in social contact with one another.

4.2.32 Before 1960, otters utilised most river catchments in Hampshire. Yet a comprehensive survey in 1989/901 revealed the presence of otters on only three river catchments in the county. Additional surveys and monitoring have identified otters on the River Avon, scant evidence within the New Forest particularly the lower Lymington River and Keyhaven Marshes and a breeding population in the River Itchen catchment (Hampshire Biodiversity Partnership, 2000).

4.2.33 The Itchen otter population follows the release of three captive-bred animals in 1993 to the River Itchen to boost its natural and isolated remnant population, this catchment continues to support the strongest otter population in Hampshire (Hampshire Biodiversity Partnership, 2000).

4.2.34 Climate change is driving increases in river temperatures which will create stress for a range of characteristic riverine species, which may impact prey abundance and composition for otters. The overall vulnerability of the River Itchen SAC to climate change has been assessed by Natural England as being high, taking into account the sensitivity, fragmentation, topography and management of its habitats and supporting habitats (Natural England, 2019a).

Atlantic Salmon

4.2.35 The Atlantic salmon *Salmo salar* is an anadromous species (i.e. adults migrate from the sea to breed in freshwater). Spawning takes place in shallow excavations called redds, found in shallow gravelly areas in clean rivers and streams where the water flows swiftly. The young that emerge spread out into other parts of the river. After a period of 1-6 years the young salmon migrate downstream to the sea as 'smolts'. Salmon have a homing instinct that draws them back to spawn in the river of their birth after 1-3 years in the sea. This behaviour has resulted in genetically distinct stock between rivers and even within individual rivers, with some evidence of further genetic distinctiveness in the tributaries of large rivers.

4.2.36 Salmon rivers vary considerably in their ecological and hydrological characteristics and in the life-cycle strategies adopted by the salmon within them. There are particularly strong contrasts between southern and northern rivers, and the UK's varied climate, geology and terrain means that high diversity can be found within some of the large rivers. The cool and wet climate in the north, often with harder, more resistant rocks and steeper slopes, results in salmon rivers that are sparsely vegetated, nutrient-poor and prone to sudden increases in flow ('spates') in response to heavy downfalls or sudden snow-melt. As a result, salmon may take several years to reach the smolt stage and migrate to sea. In the south, rivers flow across gentler terrain and softer rocks, in a warmer, drier climate. Here, salmon often grow sufficiently quickly to smolt as yearlings.

4.2.37 The species is subject to many pressures in Europe, including pollution, the introduction of non-native salmon stocks, physical barriers to migration, exploitation from netting and angling, physical degradation of spawning and nursery habitat, and increased marine mortality.

4.2.38 Increasing water temperatures as a result of climate change can affect egg development, fish survival, feeding and growth. The salmon is considered particularly vulnerable to increasing temperatures in the southern part of its English range, most notably in chalk streams (Natural England, 2019a).

Desmoulin's Whorl Snail

4.2.39 Desmoulin's whorl snail *Vertigo moulinsiana* is the largest Vertigo species, with a shell height up to about 2.6 mm. It is restricted to calcareous wetlands, usually bordering lakes or rivers, or in fens. High humidity appears to be important in determining local distribution within sites. It normally lives on reed-grasses and sedges, such as reed sweet-grass *Glyceria maxima* and tussocks of greater pond-sedge *Carex riparia* and lesser pond-sedge *C. acutiformis*, where it feeds on the microflora, and in autumn it may ascend taller reeds and scrub. Like all Annex II *Vertigo* species, it is highly dependent on maintenance of existing local hydrological conditions.

4.2.40 When the Solent Maritime SAC was designated in 2005 the site supported a small population of Desmoulin's whorl snail in the freshwater fen and brackish reedbeds at the top of Fishbourne Channel in Chichester Harbour. This is the only recorded site for Desmoulin's whorl snail within the Solent Maritime SAC and the species was last recorded here in 2005. No individuals were found during surveys in 2009 and 2010. The population in Fishbourne Channel is likely to have been a small relict population that was originally more widespread prior to development of housing and infrastructure in the area[13].

4.3 Qualifying Habitats of Special Areas of Conservation

4.3.1 The following accounts are adapted from the Natural England's Supplementary Advice on Conserving and Restoring Site Features for the five SACs (New Forest, Butser Hill, River Itchen, Solent and Isle of Wight Lagoons and Solent Maritime), which are considered in the HRA[14].

Oligotrophic waters containing very few minerals of sandy plains (Littorelletalia uniflorae)

4.3.2 This type of waterbody is restricted to sandy plains that are acidic and low in nutrients, and are therefore very scarce. The water is typically very clear and moderately acid. Destruction of lowland heaths, land drainage and nutrient enrichment have contributed to the scarcity of the habitat type. The habitat type is characterised by the presence of *Littorelletalia*-type vegetation. Such vegetation is characterised by the presence of water lobelia *Lobelia dortmanna*, shoreweed *Littorella uniflora*, or quillwort *Isoetes lacustris*.

4.3.3 Hatchet Pond in the New Forest in the south of England is in fact three ponds, one of which is an example of an oligotrophic waterbody amidst wet and dry lowland heath developed over fluvial deposits. It contains shoreweed *Littorella uniflora* and isolated populations of northern species such as bog orchid *Hammarbya paludosa* and floating bur-reed *Sparganium angustifolium*, alongside rare southern species such as Hampshire-purslane *Ludwigia palustris*. Hatchet Pond is therefore important as a southern example of this lake type where northern species, more common in the uplands of the UK, co-exist with southern species.

Oligotrophic to mesotrophic standing waters with vegetation of the Littorelletea uniflorae and/or of the Isoëto-Nanojuncetea

4.3.4 The clear soft water which characterises this habitat type contains low to moderate levels of plant nutrients and supports a characteristic assemblage of plant species. The vegetation community is characterised by amphibious short perennial vegetation, with shoreweed *Littorella uniflora* being considered as the defining component. This species often occurs in association with water lobelia *Lobelia dortmanna*, bog pondweed *Potamogeton polygonifolius*, quillwort *Isoetes lacustris*, bulbous rush *Juncus bulbosus*, needle spike-rush *Eleocharis acicularis*, alternate water milfoil *Myriophyllum alterniflorum* and floating water bur-reed *Sparganium angustifolium*. Yellow water-lily *Nuphar lutea*, amphibious bistort *Persicaria amphibia*,

[13] Natural England Conservation Advice for Marine Protected Areas: Solent Maritime SAC. Accessed online [9/1/18] at: https://designatedsites.naturalengland.org.uk/Marine/MarineSiteDetail.aspx?SiteCode=UK0030059&SiteName=solent&countyCode=&responsiblePerson=#condition

[14] http://jncc.defra.gov.uk/ProtectedSites/SACselection/SAC_habitats.asp

stoneworts *Chara spp.*, least bur-reed *Sparganium natans* and other pondweeds *Potamogeton spp.* may be present in more mesotrophic conditions.

4.3.5 In the New Forest vegetation of the *Littorelletea uniflorae* and/or of the *Isoëto-Nanojuncetea* occurs on the edge of large temporary ponds, shallow ephemeral pools and poached damp hollows in grassland, which support a number of specialist species in a zone with toad rush *Juncus bufonius*. These include the two nationally scarce species coral-necklace *Illecebrum verticillatum* and yellow centaury *Cicendia filiformis*, often in association with allseed *Radiola linoidesand* chaffweed *Anagallis minima*. Heavy grazing pressure is of prime importance in the maintenance of the outstanding flora of these temporary pond communities. Livestock maintain an open habitat, controlling scrub ingress, and trampling the surface. Commoners' animals also transport seed in their hooves widely from pond to pond where suitable habitat exists. Temporary ponds occur throughout the Forest in depressions capable of holding water for part of the year. Most ponds are small (between 5-10m across) and, although great in number, amount to less than 10ha in total area.

Northern Atlantic wet heaths with Erica tetralix

4.3.6 Wet heath usually occurs on acidic, nutrient-poor substrates, such as shallow peats or sandy soils on impeded drainage. The vegetation is typically dominated by mixtures of cross-leaved heath *Erica tetralix*, heather *Calluna vulgaris*, grasses, sedges and *Sphagnum* bog-mosses.

4.3.7 The New Forest contains the most extensive stands of lowland northern Atlantic wet heaths in southern England, mainly of the M16 *Erica tetralix – Sphagnum compactum* type. M14 *Schoenus nigricans– Narthecium ossifragum* mire is also found on this site. The wet heaths are important for rare plants, such as marsh gentian *Gentiana pneumonanthe* and marsh clubmoss *Lycopodiella inundata*, and a number of dragonfly species, including the scarce blue-tailed damselfly and small red damselfly *Ceriagrion tenellum*. There is a wide range of transitions between wet heath and other habitats, including dry heath, various woodland types, *Molinia* grasslands, fen, and acid grassland. Wet heaths enriched by bog myrtle *Myrica gale* are a prominent feature of many areas of the Forest. Unlike much lowland heath, the New Forest heaths continue to be extensively grazed by cattle and horses, favouring species with low competitive ability.

European dry heaths

4.3.8 European dry heaths typically occur on freely-draining, acidic to circum-neutral soils with generally low nutrient content. Ericaceous dwarf-shrubs dominate the vegetation. The most common is heather *Calluna vulgaris*, which often occurs in combination with gorse *Ulex spp.*, bilberry *Vaccinium spp.* or bell heather *Erica cinerea*, though other dwarf-shrubs are important locally. Nearly all dry heath is seminatural, being derived from woodland through a long history of grazing and burning.

4.3.9 The New Forest represents European dry heaths in southern England and is the largest area of lowland heathland in the UK. It is particularly important for the diversity of its habitats and the range of rare and scarce species which it supports. The New Forest is unusual because of its long history of grazing in a traditional fashion by ponies and cattle. The dry heaths of the New

Forest are of the H2 Calluna vulgaris – Ulex minor heath type, and H3 Ulex minor – Agrostis curtisii heath is found on damper areas. There are a wide range of transitions between dry heath and wet heath, Molinia grassland, fen, acid grassland and various types of scrub and woodland. Both the New Forest and the two Dorset Heath SACs are in southern England. All three areas are selected because together they contain a high proportion of all the lowland European dry heaths in the UK. There are, however, significant differences in the ecology of the two areas, associated with more oceanic conditions in Dorset and the continuous history of grazing in the New Forest.

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

4.3.10 *Molinia* meadows are found mainly on moist, moderately base-rich, peats and peaty gley soils, often with fluctuating water tables. They usually occur as components of wet pastures or fens, and often form mosaics with dry grassland, heath, mire and scrub communities. This habitat type includes the most species-rich *Molinia* grasslands in the UK, in which purple moor-grass *Molinia caerulea* is accompanied by a wide range of associated species, including rushes, sedges and tall-growing herbs. The New Forest represents *Molinia* meadows in southern England.

4.3.11 The site supports a large area of the heathy form of M24 Molinia *caerulea–Cirsium dissectum* fen-meadow. This vegetation occurs in situations of heavy grazing by ponies and cattle in areas known locally as 'lawns', often in a fine-scale mosaic with 4010 Northern Atlantic wet heaths and other mire and grassland communities. These lawns occur on flushed soils on slopes and on level terrain on the floodplains of rivers and streams. The New Forest *Molinia* meadows are unusual in the UK in terms of their species composition, management and landscape position. The grasslands are species-rich, and a particular feature is the abundance of small sedges such as carnation sedge *Carex panicea*, common sedge *C. nigra* and yellow-sedge *C. viridula ssp. oedocarpa*, and the more frequent occurrence of mat-grass *Nardus stricta* and petty whin *Genista anglica* compared to stands elsewhere in the UK.

Depressions on peat substrate of the Rhynchosporion

4.3.12 Depressions on peat substrates of the *Rhynchosporion* occur in complex mosaics with lowland wet heath and valley mire vegetation, in transition mires, and on the margins of bog pools and hollows in both raised and blanket bogs. The vegetation is typically very open, usually characterised by an abundance of white beak-sedge *Rhynchospora alba*, often with well-developed algal mats, the bog moss *Sphagnum denticulatum*, round-leaved sundew *Drosera rotundifolia* and, in relatively base-rich sites, brown mosses such as *Drepanocladus revolvens* and *Scorpidium scorpioides*. The Nationally scarce species brown beak-sedge *Rhynchospora fusca* and marsh clubmoss *Lycopodiella inundata* also occur in this habitat.

4.3.13 The New Forest, one of three sites selected in southern England, is considered to hold the largest area in England of Depressions on peat substrates of the *Rhynchosporion*, in complex habitat mosaics associated primarily with the extensive valley bogs of this site. The habitat type is developed in three situations: in natural bog pools of patterned bog surfaces, in flushes on the margins of valley mires and in areas disturbed by peat-digging, footpaths, tracks, ditches etc. In places the habitat type is rich in brown mosses *Cratoneuron spp.* and *Scorpidium*

scorpioides, suggesting flushing by mineral-rich waters. The mosaics in which this habitat type occurs are an important location for bog orchid *Hammarbya paludosa*.

Atlantic acidophilous beech forests with Ilex and sometimes also Taxus in the shrublayer (Quercion robori-petraeae or Ilici-Fagenion)

4.3.14 This habitat comprises beech *Fagus sylvatica* forests with holly *Ilex*, growing on acid soils, in a humid Atlantic climate. Sites of this habitat type often are, or were, managed as wood-pasture systems, in which pollarding of beech and oak *Quercus spp*. was common. This is known to prolong the life of these trees. Typical species include holly *Ilex aquifolium*, bracken *Pteridium aquilinum* and bramble *Rubus fruticosus*, with wavy hair-grass *Deschampsia flexuosa* in the most acidic areas. Epiphyte richness can be a key factor in defining hyper-Atlantic forms of this habitat type.

4.3.15 The New Forest is the largest area of mature, semi-natural beech *Fagus sylvatica* woodland in Britain and represents Atlantic acidophilous beech forests in the most southerly part of the habitat's UK range. The mosaic with other types of woodland and heath has allowed unique and varied assemblages of epiphytic lichens and saproxylic invertebrates to be sustained, particularly in situations where the woodland is open and the tree trunks receive plenty of light. The traditional common grazing in the Forest by cattle and ponies provides opportunities to explore the impact of large herbivores on the woodland system.

Asperulo-Fagetum beech forests

4.3.16 This habitat occurs on circumneutral to calcareous soils. UK stands of *Asperulo-Fagetum* beech forest belong to the central and northern European associations of the habitat but with correspondingly more Atlantic species, including holly *Ilex aquifolium* and bluebell *Hyacinthoides non-scripta*. Rare plants associated with this form of woodland in the UK include red helleborine *Cephalanthera rubra*, wood barley *Hordelymus europaeus*, coral-root *Cardamine bulbifera* and box *Buxus sempervirens*. While many sites have a core of ancient woodland, planting of beech *Fagus sylvatica* and its natural spread on to adjacent grassland under reduced grazing pressures have led in places to an expansion of this habitat over the 20th century. Sites therefore often have a complicated history. The beech dominance in particular has often been emphasised by past silvicultural treatment.

4.3.17 The New Forest is the largest area of mature, semi-natural beechen *Fagus sylvatica* woodland in Britain; much of it is a form of W14 *Fagus sylvatica – Rubus fruticosus* woodland that conforms to the Annex I type *Asperulo-Fagetum* beech forests. The mosaic with other types of woodland and heath has allowed unique and varied assemblages of epiphytic lichens and saproxylic invertebrates to be sustained, particularly in situations where the woodlands are open and the tree trunks receive plenty of light. The traditional common grazing in the Forest by cattle and ponies provides opportunities to explore the impact of large herbivores on the woodland system.

Old acidophilous oak woods with Quercus robur on sandy plains

4.3.18 This habitat type comprises ancient lowland oak woodland on acidic, sandy or gravelly substrates. Veteran trees are relatively abundant in UK stands compared to examples in continental Europe, and are often associated with assemblages of notable lichens, fungi and invertebrates.

4.3.19 The New Forest is representative of old acidophilous oak woods in the southern part of its UK range. It is the most extensive area of active wood-pasture with old oak *Quercus spp*. and beech *Fagus sylvatica* in north-west Europe and has outstanding invertebrate and lichen populations. This site was preferred over other sites that lack a succession of age-classes because, although scattered over a wide area, the oak stands are found within a predominantly semi-natural landscape with a more balanced age-structure of trees. The traditional common grazing in the Forest by cattle and ponies provides opportunities to explore the impact of large herbivores on the woodland system. The New Forest has been identified as of potential international importance for its saproxylic invertebrate fauna by the Council of Europe (Speight 1989).

Bog woodland Priority feature

4.3.20 Under certain combinations of physical circumstances in the UK, scattered trees can occur across the surface of a bog in a relatively stable ecological relationship as open woodland, without the loss of bog species. This true Bog woodland is a much rarer condition than the progressive invasion of bogs by trees, through natural colonisation or afforestation following changes in the drainage pattern which leads eventually to the loss of the bog community. The habitat type has not previously been well described in the UK, and consequently knowledge of its ecological characteristics is limited.

4.3.21 Within the New Forest, in southern England, birch – willow *Betula – Salix* stands occur over valley bog vegetation, with fringing alder *Alnus – Sphagnum* stands where there is some water movement. These stands appear to have persisted for long periods in stable association with the underlying *Sphagnum* bog-moss communities. The rich epiphytic lichen communities and pollen record provide evidence for the persistence of this association. The Bog woodland occurs in association with a range of other habitats for which the site has also been selected.

Alluvial forests with Alnus glutinosa and Fraxinus excelsior (Alno-Padion, Alnion incanae, Salicion albae) Priority feature

4.3.22 Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion, Alnion incanae, Salicion albae*) comprises woods dominated by alder *Alnus glutinosa* and willow *Salix spp.* on flood plains in a range of situations from islands in river channels to low-lying wetlands alongside the channels.

4.3.23 The habitat typically occurs on moderately base-rich, eutrophic soils subject to periodic inundation. Many such woods are dynamic, being part of a successional series of habitats. Their structure and function are best maintained within a larger unit that includes the open communities, mainly fen and swamp, of earlier successional stages. On the drier margins of

these areas other tree species, notably ash *Fraxinus excelsior* and elm *Ulmus spp.*, may become abundant. In other situations the alder woods occur as a stable component within transitions to surrounding dry-ground forest, sometimes including other Annex I woodland types. These transitions from wet to drier woodland and from open to more closed communities provide an important facet of ecological variation.

4.3.24 The ground flora is correspondingly varied. Some stands are dominated by tall herbs, reeds and sedges, for example common nettle *Urtica dioica*, common reed *Phragmites australis*, greater tussock-sedge *Carex paniculata*, and meadowsweet *Filipendula ulmaria*, while others have lower-growing communities with creeping buttercup *Ranunculus* repens, common marsh bedstraw *Galium palustre*, alternate-leaved golden-saxifrage *Chrysosplenium oppositifolium* and marsh-marigold *Caltha palustris*.

4.3.25 The New Forest contains many streams and some small rivers that are less affected by drainage and canalisation than those in any other comparable area in the lowlands of England. Associated with many of the streams, particularly those with alkaline and neutral groundwater, are strips of alder *Alnus glutinosa* woodland which, collectively, form an extensive resource with a rich flora. In places there are examples of transitions from open water through reed swamp and fen to alder woodland. The small rivers show natural meanders and debris dams, features that are otherwise rare in the lowlands, with fragmentary ash *Fraxinus excelsior* stands as well as the alder strips.

Transition mires and quaking bogs

4.3.26 The term 'transition mire' relates to vegetation that in floristic composition and general ecological characteristics is transitional between acid bog and Alkaline fens, in which the surface conditions range from markedly acidic to slightly base-rich. The vegetation normally has intimate mixtures of species considered to be acidophile and others thought of as calciphile or basophile. In some cases the mire occupies a physically transitional location between bog and fen vegetation, as for example on the marginal lagg of raised bog or associated with certain valley and basin mires. In other cases these intermediate properties may reflect the actual process of succession, as peat accumulates in groundwater-fed fen or open water to produce rainwater-fed bog isolated from groundwater influence. Many of these systems are very unstable underfoot and can therefore also be described as 'quaking bogs'.

Alkaline fens

4.3.27 Alkaline fens consist of a complex assemblage of vegetation types characteristic of sites where there is tufa and/or peat formation with a high water table and a calcareous base-rich water supply. There is considerable variation between sites in the associated communities and the transitions that may occur. Such variation can be broadly classified by the geomorphological situation in which the fen occurs, namely: flood plain mire, valley mire, basin mire, hydroseral fen (i.e. as zones around open waterbodies) and spring fen.

Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco-Brometalia)

4.3.28 Festuco-*Brometalia grasslands* are found on thin, well-drained, lime-rich soils associated with chalk and limestone. They occur predominantly at low to moderate altitudes in England and Wales. Most of these calcareous grasslands are maintained by grazing. A large number of rare plants are associated with this habitat, including purple milk-vetch *Astragalus danicus*, dwarf sedge *Carex humilis*, spotted cat's-ear *Hypochaeris maculata*, spring cinquefoil *Potentilla tabernaemontani*, pasque flower *Pulsatilla vulgaris* and bastard-toadflax *Thesium humifusum*. The invertebrate fauna is also noteworthy, and includes rarities such as the adonis blue *Lysandra bellargus* and silver-spotted skipper *Hesperia comma*.

4.3.29 This habitat includes various forms of calcareous grassland referable in European terms to the *Mesobromion* and *Xerobromion* alliances. All forms of *Festuco-Brometalia* grassland comprise mixtures of grasses and herbs, in which there is at least a moderate representation of calcicolous species. The structural and floristic characteristics of the habitat are strongly influenced by climatic factors and management practices, in particular the intensity of grazing.

4.3.30 Butser Hill is situated on the east Hampshire chalk which forms part of the South Downs. Much of the site consists of CG2 *Festuca ovina – Avenula pratense* grassland. The site has a varied range of slope gradients and aspects which has a strong influence on the vegetation composition. A particular feature of the site is its lower plant assemblage. It has the richest terricolous lichen flora of any chalk grassland site in England, and also supports the distinctive *Scapanietum asperae* or southern hepatic mat association of leafy liverworts and mosses on north-facing chalk slopes. This association is very rare in the UK and Butser Hill supports the largest known example. The site exhibits various transitions between semi-natural dry grassland, chalk heath, mixed scrub and *Taxus baccata* woods.

Taxus baccata woods of the British Isles Priority feature

4.3.31 Yew *Taxus baccata* woodland occurs on shallow, dry soils usually on chalk or limestone slopes, but in a few areas stands on more mesotrophic soils are found. The habitat is classified as NVC type W13 *Taxus baccata* woodland. Within this community yew tends to be overwhelmingly dominant and is usually associated with a very sparse shrub and tree layer. Only a few species, such as dog's mercury *Mercurialis perennis*, can survive beneath the dense shade cast by the canopy of mature yew trees. Association with beech *Fagus sylvatica* and holly *Ilex aquifolium* is less common than in mainland Europe.

4.3.32 Ecological variation arises according to the nature of the yew wood. In the south this type may be either the senescent phase of beech woodland supporting clusters of yew after the fall of beech, or primary woodland developing on unstable slopes. Very locally, box *Buxus sempervirens* may occur below the yew. Eventually individual ash *Fraxinus excelsior* or beech trees may grow through in gaps to recreate an overstorey. More northerly examples tend to be associated with ash and elm *Ulmus spp.*, and in these situations yew is more likely to remain as the main overstorey species.

4.3.33 The combes of the south-east flank of Butser Hill support dense yew *Taxus baccata* woodland in association with scrub and chalk grassland. The yew is regenerating into the grassland and shows the classic interaction of these habitats in relation to grazing pressure.

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

4.3.34 This habitat type is generally characterised by the abundance of water-crowfoots *Ranunculus spp*. Floating mats of these white-flowered species are characteristic of river channels in early to midsummer. They help to vary water flow, promote fine sediment deposition, and provide shelter and food for fish and invertebrate animals.

4.3.35 There are several variants of this habitat in the UK, depending on geology and river type, and at each site, the *Ranunculus* species will be associated with a different assemblage of other aquatic plants. The River Itchen is dominated throughout by aquatic *Ranunculus spp*. The headwaters contain pond watercrowfoot *Ranunculus peltatus*, while two *Ranunculus* species occur further downstream: stream watercrowfoot *R. penicillatus ssp. pseudofluitans*, a species especially characteristic of calcium-rich rivers, and river water-crowfoot *R. fluitans*.

4.3.36 The habitat type is widespread in rivers in the UK, especially on softer and more mineral-rich substrates. It is largely absent from areas underlain by acid rock types (principally in the north and west). It has been adversely affected by nutrient enrichment, mainly from sewage inputs and agriculture, and where agriculture has caused serious siltation. It is also vulnerable to artificial reductions in river flows and to unsympathetic channel engineering works. Consequently, the habitat has been reduced or has disappeared from parts of its range in Britain. Coastal lagoons Priority feature

4.3.37 The Solent on the south coast of England encompasses a series of Coastal lagoons, including percolation, isolated and sluiced lagoons. The site includes a number of lagoons in the marshes in the Keyhaven – Pennington area, at Farlington Marshes in Chichester Harbour, behind the sea-wall at Bembridge Harbour and at Gilkicker, near Gosport. The lagoons show a range of salinities and substrates, ranging from soft mud to muddy sand with a high proportion of shingle, which support a diverse fauna including large populations of three notable species: the nationally rare foxtail stonewort *Lamprothamnium papulosum*, the nationally scarce lagoon sand shrimp *Gammarus insensibilis*, and the nationally scarce starlet sea anemone *Nematostella vectensis*. The lagoons in Keyhaven – Pennington Marshes are part of a network of ditches and ponds within the saltmarsh behind a sea-wall. Farlington Marshes is an isolated lagoon in marsh pasture that, although separated from the sea by a sea-wall, receives sea water during spring tides. The lagoon holds a well-developed low-medium salinity insect-dominated fauna. Gilkicker Lagoon is a sluiced lagoon with marked seasonal salinity fluctuation and supports a high species diversity. The lagoons at Bembridge Harbour have formed in a depression behind the sea-wall and sea water enters by percolation. Species diversity in these lagoons is high and the fauna includes very high densities of *N. vectensis*.

Estuaries

4.3.38 The Solent encompasses a major estuarine system on the south coast of England with four coastal plain estuaries (Yar, Medina, King's Quay Shore, Hamble) and four bar-built estuaries (Newtown Harbour, Beaulieu, Langstone Harbour, Chichester Harbour). The site is the only one in the series to contain more than one physiographic sub-type of estuary and is the only cluster site. The Solent and its inlets are unique in Britain and Europe for their hydrographic regime of four tides each day, and for the complexity of the marine and estuarine habitats present within the area. Sediment habitats within the estuaries include extensive estuarine flats, often with intertidal areas supporting eelgrass Zostera *spp.* and green algae, sand and shingle spits, and natural shoreline transitions. The mudflats range from low and variable salinity in the upper reaches of the estuaries to very sheltered almost fully marine muds in Chichester and Langstone Harbours. Unusual features include the presence of very rare sponges in the Yar estuary and a sandy 'reef' of the polychaete *Sabellaria spinulosa* on the steep eastern side of the entrance to Chichester Harbour.

Spartina swards (Spartinion maritimae)

4.3.39 Cord-grass *Spartina spp*. colonises a wide range of substrates, from very soft muds to shingle, in areas sheltered from strong wave action. It occurs on the seaward fringes of saltmarshes and creek-sides and may colonise old pans in the upper saltmarsh.

4.3.40 Solent Maritime is the only site for smooth cord-grass *Spartina alterniflora* in the UK and is one of only two sites where significant amounts of small cord-grass *S. maritime* are found. It is also one of the few remaining sites for Townsend's cord-grass *S.x townsendii* and holds extensive areas of common cord-grass *Spartina anglica*, all four taxa thus occurring here in close proximity. It has additional historical and scientific interest as the site where *S. alterniflora* was first recorded in the UK (1829) and where *S.* x *townsendii* and, later, *S. anglica* first occurred

Atlantic salt meadows (Glauco-Puccinellietalia maritimae)

4.3.41 Atlantic salt meadows develop when halophytic vegetation colonises soft intertidal sediments of mud and sand in areas protected from strong wave action. This vegetation forms the middle and upper reaches of saltmarshes, where tidal inundation still occurs but with decreasing frequency and duration. A wide range of community types is represented and the saltmarshes can cover large areas, especially where there has been little or no enclosure on the landward side. The vegetation varies with climate and the frequency and duration of tidal inundation. Grazing by domestic livestock is particularly significant in determining the structure and species composition of the habitat type and in determining its relative value for plants, for invertebrates and for wintering or breeding waterfowl.

4.3.42 The Solent contains the second-largest aggregation of Atlantic salt meadows in south and south-west England. Solent Maritime is a composite site composed of a large number of separate areas of saltmarsh. In contrast to the Severn estuary, the salt meadows at this site are notable as being representative of the ungrazed type and support a different range of communities dominated by sea-purslane *Atriplex portulacoides*, common sea-lavender *Limonium vulgare* and thrift *Armeria maritima*. As a whole the site is less truncated by man-

made features than other parts of the south coast and shows rare and unusual transitions to freshwater reedswamp and alluvial woodland as well as coastal grassland. Typical Atlantic salt meadow is still widespread in this site, despite a long history of colonisation by cord-grass *Spartina spp.*

Sandbanks which are slightly covered by sea water all the time

4.3.43 Sandbanks which are slightly covered by sea water all the time consist of sandy sediments that are permanently covered by shallow sea water, typically at depths of less than 20m below chart datum (but sometimes including channels or other areas greater than 20m deep). The habitat comprises distinct banks (i.e. elongated, rounded or irregular 'mound' shapes) which may arise from horizontal or sloping plains of sandy sediment.

4.3.44 Shallow sandy sediments are typically colonised by a burrowing fauna of worms, crustaceans, bivalve molluscs and echinoderms. Mobile epifauna at the surface of the sandbank may include shrimps, gastropod molluscs, crabs and fish. Sand-eels *Ammodytes spp.*, an important food for birds, live in sandy sediments. Where coarse stable material, such as shells, stones or maerl is present on the sediment surface, species of foliose seaweeds, hydroids, bryozoans and ascidians may form distinctive communities. Shallow sandy sediments are often important nursery areas for fish, and feeding grounds for seabirds (especially puffins *Fratercula arctica,* guillemots *Uria aalge* and razorbills *Alca torda*) and sea-duck (e.g. common scoter *Melanitta nigra*).

Mudflats and sandflats not covered by water at low tide

4.3.45 Intertidal mudflats and sandflats are submerged at high tide and exposed at low tide. They form a major component of the qualifying habitats Estuaries and Large shallow inlets and bays in the UK but also occur extensively along the open coast and in lagoonal inlets. The physical structure of the intertidal flats ranges from mobile, coarse-sand beaches on wave-exposed coasts to stable, fine-sediment mudflats in estuaries and other marine inlets. This habitat type can be divided into three broad categories (clean sands, muddy sands and muds); although in practice there is a continuous gradation between them. Within this range the plant and animal communities present vary according to the type of sediment, its stability and the salinity of the water.

Annual vegetation of drift lines

4.3.46 This habitat type occurs on deposits of shingle lying at or above mean high-water spring tides. The types of deposits involved are generally at the lower end of the size range of shingle (2-200 mm diameter), with varying amounts of sand interspersed in the shingle matrix. These shingle deposits occur as fringing beaches that are subject to periodic displacement or overtopping by high tides and storms. The distinctive vegetation, which may form only sparse cover, is therefore ephemeral and composed of annual or short-lived perennial species.

4.3.47 In the UK this habitat type is not always easy to classify using the NVC because it is highly variable between sites and from year to year at the same site. It can include NVC types SD2 *Honkenya peploides –Cakile maritime* strandline community and SD3 *Matricaria maritima –*

Galium aparine strandline community on stony substrates. MC6 *Atriplex prostrata – Beta vulgaris ssp.* Maritime sea-bird cliff community and other vegetation with abundant orache Atriplex *spp.* may also occur on shingle shores.

Perennial vegetation of stony banks

4.3.48 Shingle structures develop when a sequence of foreshore beaches is deposited at the limit of high tide. More permanent ridges are formed as storm waves throw pebbles high up on the beach, from where the backwash cannot remove them. Several beaches may be piled against each other and extensive structures can form. The ecological variation in this habitat type depends on stability, the amount of fine material accumulating between pebbles, climatic conditions, width of the foreshore, and past management of the site. The ridges and lows formed also influence the vegetation patterns, resulting in characteristic zonations of vegetated and bare shingle.

Salicornia and other annuals colonising mud and sand

4.3.49 This pioneer saltmarsh vegetation colonises intertidal mud and sandflats in areas protected from strong wave action and is an important precursor to the development of more stable saltmarsh vegetation. It develops at the lower reaches of saltmarshes where the vegetation is frequently flooded by the tide, and can also colonise open creek sides, depressions or pans within saltmarshes, as well as disturbed areas of upper saltmarshes.

4.3.50 There is little variation within this habitat type, which typically comprises a small number of species. The following NVC types are represented: SM7 *Arthrocnemum perenne* stands, SM8 Annual *Salicornia* salt-marsh community, SM9 *Suaeda maritime* salt-marsh community, SM27 Ephemeral salt-marsh vegetation with *Sagina maritime*. The first three communities include open stands of perennial glasswort *Sarcocornia perennis*, glasswort *Salicornia spp.*, or annual seablite *Suaeda maritima*. The density of these plants can vary and may be lower on sites with sandier substrates. Other species that may be found include common saltmarsh-grass *Puccinellia maritima*, common cord-grass *Spartina anglica* and sea aster *Aster tripolium*. *Sarcocornia perennis* is absent from Scotland. A further form of the habitat (SM27) consists of ephemeral vegetation colonising open pans in upper saltmarshes. Characteristic plants of this vegetation type include sea pearlwort *Sagina maritime* and knotted pearlwort *S. nodosa.*

Shifting dunes along the shoreline with Ammophila arenaria (`white dunes`)

4.3.51 This habitat type encompasses most of the vegetation of unstable dunes where there is active sand movement. Under these conditions sand-binding marram *Ammophila Arenaria* is always a prominent feature of the vegetation and is usually dominant. In the UK the majority of such vegetation falls within NVC type SD6 *Ammophila Arenaria* mobile dune community. This is a dynamic vegetation type maintained only by change. It can occur on both accreting and eroding dunes, but will rapidly change and disappear if stability is imposed.

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5 The Fareham Borough Local Plan

5.1 Introduction

5.1.1 The Fareham Borough Local Plan will set the planning strategy for the Borough and address housing and employment needs for a period of 16 years from 2021 up to 2037. The plan sets out proposed strategic and development management policies, development allocations and actions to meet the environmental, social and economic challenges facing the Borough. When adopted the Local Plan will provide a strategy for the distribution, scale and form of development and supporting infrastructure, a set of proposals to deliver the strategy, policies against which to assess planning applications, and proposals for monitoring the successful implementation of the plan.

5.2 Key Policy Proposals

5.2.1 The spatial development strategy proposed by the Publication Plan includes:

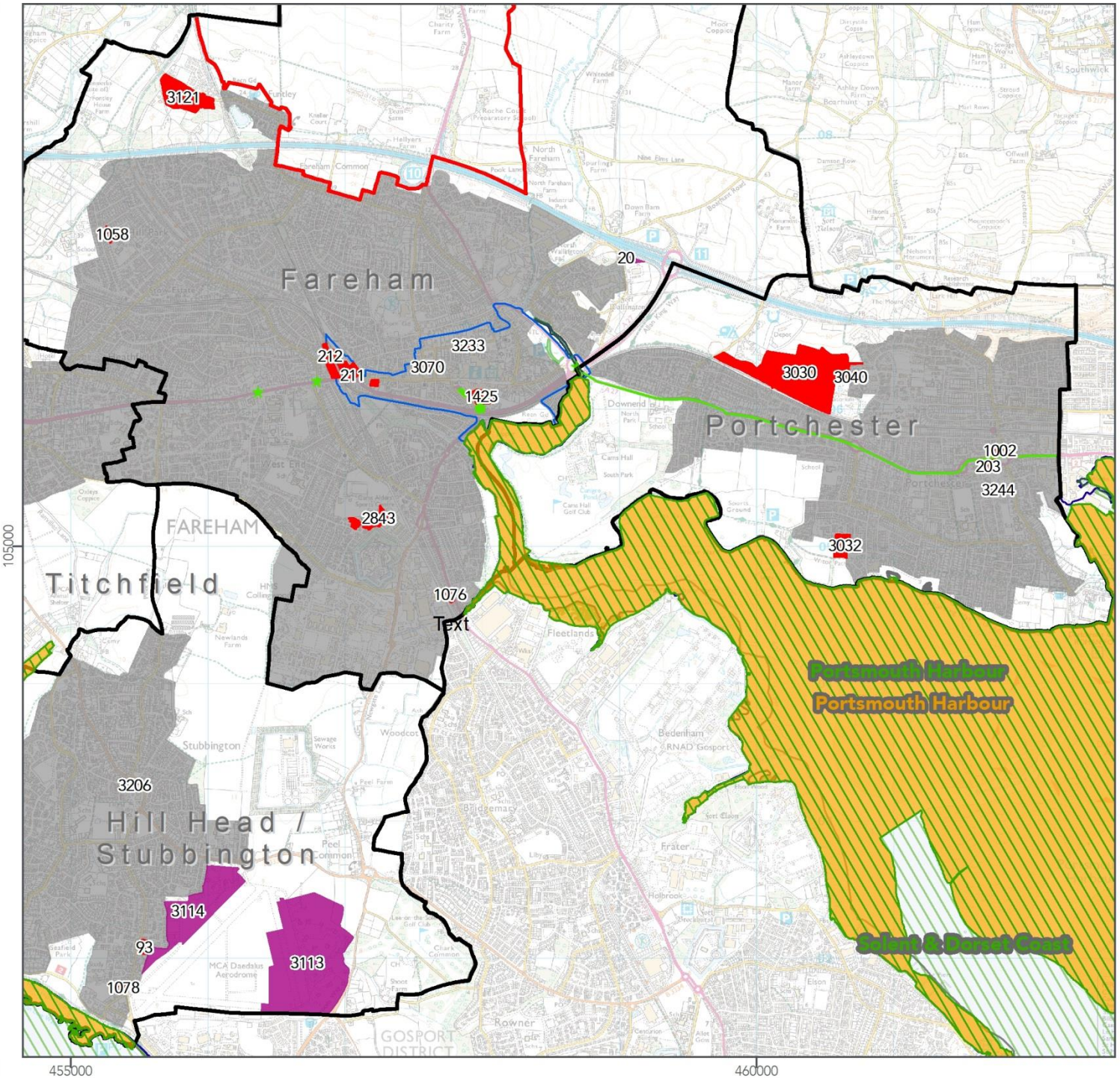
- Provision for 8,389 new dwellings and 104,000m^2 of new employment floorspace;
- The strategic employment site at Daedalus to support the Solent Enterprise Zone and deliver an additional 77,200m^2 over and above that already planned;
- Strategic opportunities at Fareham Town Centre that contribute to the delivery of at least 380 dwellings as part of a wider regeneration strategy; and
- Development allocations on previously developed land where available, and on greenfield land around the edges of existing urban areas in order to meet remaining housing and employment needs, but otherwise managing appropriate levels of development outside of urban areas.

5.2.2 Allocations and other significant proposals put forward in the Fareham Local Plan are shown on Figure 5.1 and Figure 5.2.

Fareham Local Plan

- Preferred Strategic Residential Option 2f
- Preferred Strategic Employment Option 6
- Land Safeguarded for Strategic Infrastructure
- Special Areas of Conservation
- Special Protection Areas
- Ramsar
- Spatial Planning Areas
- Borough
- Welborne Policy Boundary
- Fareham Town Centre
- Defined Urban Settlement Boundaries

Figure 5.1: Proposed Allocations (east)



0 1 2
Kilometers

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Scale: 1:41,247 **Created by:** GC
Date: Sep 2020 **Reviewed by:** NP
Drawing number:
UE-0192_HRA_StratOptions_200915_east

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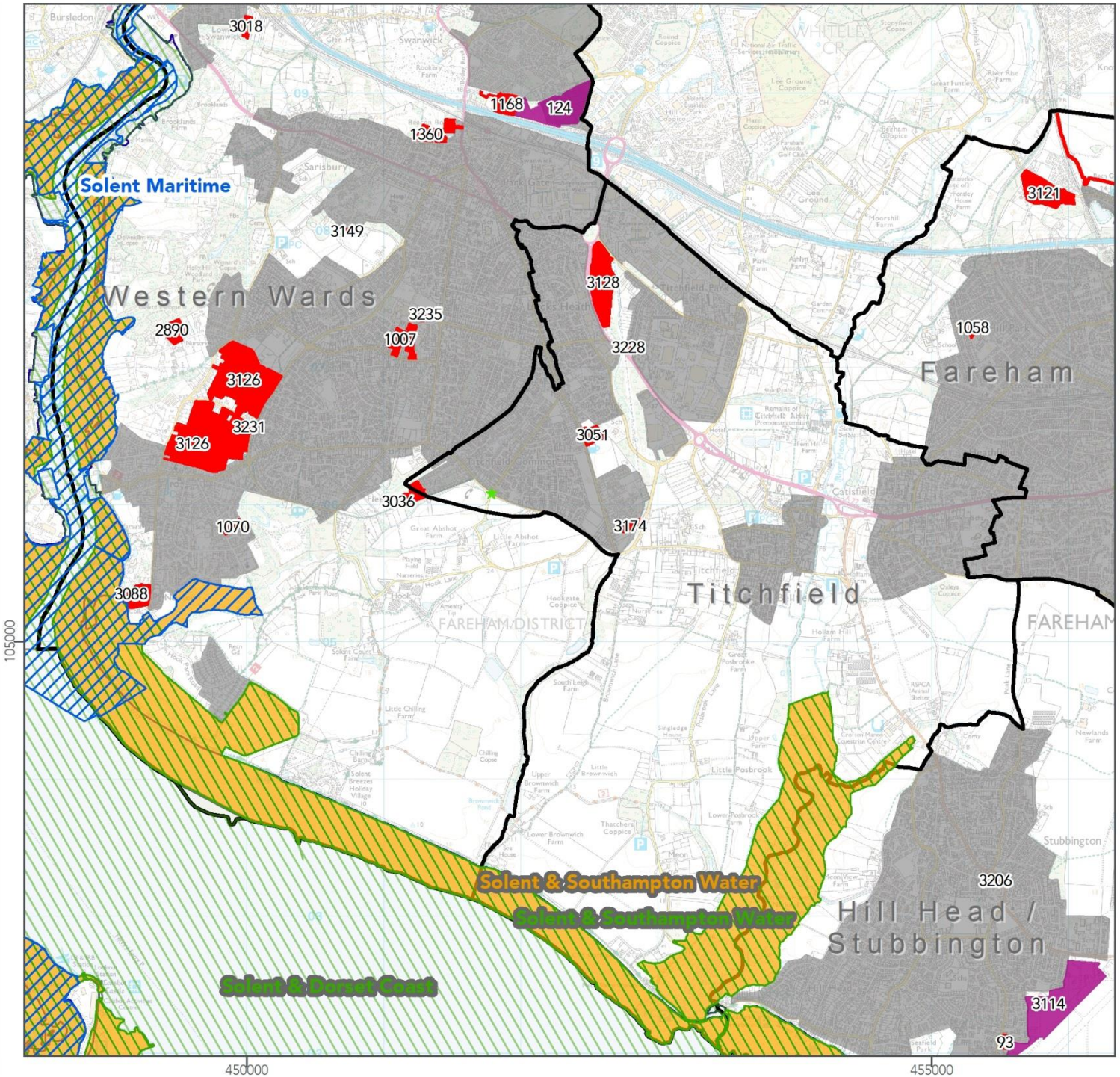
Fareham Local Plan

- Preferred Strategic Residential Option 2f
- Preferred Strategic Employment Option 6
- Land Safeguarded for Strategic Infrastructure
- Special Areas of Conservation
- Special Protection Areas
- Ramsar
- Spatial Planning Areas
- Borough
- Welborne Policy Boundary
- Fareham Town Centre
- Defined Urban Settlement Boundaries

Figure 5.2: Proposed Allocations (west)



0 1 2 Kilometers

N

Scale: 1:41,247 **Created by:** GC

Date: Sep 2020 **Reviewed by:** NP

Drawing number:

UE-0192_HRA_StratOptions_200915_west

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5.3 Incorporated Mitigation Measures

5.3.1 The Publication Plan includes incorporated mitigation measures which were devised in response to the HRA process and these are summarised in Table 5.1. Incorporated mitigation measures are considered when assessing the impacts of the Local Plan at the integrity test stage, i.e. they are not considered at the screening stage.

Table 5.1: Incorporated Mitigation Measures

Incorporated mitigation measures
Policy NE1 Protection of Nature Conservation and the Local Ecological Network
Development will be permitted where it can be clearly demonstrated that; a) Designated international and national sites, and local sites of nature conservation value are protected and enhanced, reflecting their status in the hierarchy of nature conservation designations; and b) Protected and priority species and their associated habitats, including breeding and foraging areas are protected; and c) Proposals do not prejudice the Ecological Network, or result in its fragmentation. Any development proposals that require mitigation and/or compensation measures shall be accompanied by a costed management and maintenance plan for the lifetime of the development. Proposals shall include adequate and proportionate information to enable a proper assessment of the implications for biodiversity and geodiversity Development proposals will be supported which meets and contributes to the protection, restoration, re-creation or management of biodiversity (such as the Local Ecological Network), geodiversity and natural resources within the Borough.
Policy NE2 Biodiversity Net Gain
The development of one or more dwellings or a new commercial/leisure building should provide at least 10% net gain for biodiversity for the lifetime of the development and to be accompanied by a costed management and maintenance plan.
Policy NE3 Recreational Disturbance on the Solent Special Protection Areas (SPAs)
Planning permission for proposals resulting in a net increase in residential units may be permitted where 'in-combination' effects of recreation on the Special Protection Areas are demonstrated to be satisfactorily mitigated through the provision of a financial contribution towards the Solent Recreation Mitigation Strategy. In the absence of a financial contribution towards the Solent Recreation Mitigation Strategy, proposals will need to demonstrate that any 'in combination' negative effects from recreation can either be avoided or satisfactorily mitigated through a developer-provided package of measures for the lifetime of the development.
Policy NE4 Water Quality Effects on the Special Protection Areas (SPAs), Special Areas of Conservation (SACs) and Ramsar Sites of the Solent.
All new development that would result in an increase in overnight accommodation which would cause a likely significant effect on designated sites through increased wastewater production will need to provide a Nutrient Budget. Planning permission will be granted if Nutrient Neutrality can be demonstrated either alone or with an

Incorporated mitigation measures
adequate mitigation package which demonstrates that the development can be made nutrient neutral and will remove the likely significant effect arising from increased wastewater production. Proposals that require a mitigation package in order to be nutrient neutral shall be accompanied by a costed management and maintenance plan for the lifetime of the development.
Policy NE5 Solent Wader and Brent Goose Sites
Sites which are used by Solent waders and/or Brent Geese (as shown on the Policies map) will be protected from adverse impacts commensurate to their status in the hierarchy of the Solent Wader and Brent Geese Network. <u>Core Areas and Primary Support</u> Development on 'Core and Primary Support Areas' (as shown on the Policies map) will only be permitted where it can be clearly demonstrated that: a) The proposal has sought to avoid or mitigate impacts on-site in the first instance; and b)There is to be an overall net gain to the Solent Wader and Brent Geese network; and c) A suitable, readily available replacement site which conforms entirely to the specific requirements for the Solent Waders and Brent Geese species concerned and is satisfactorily agreed by the Council and other appropriate bodies and secured in perpetuity, with a costed Habitat Management and Monitoring Plan. <u>Secondary Support Areas</u> Development on 'Secondary Support Areas' (as shown on the Policies map) will only be permitted where either: d) On site mitigation is provided which is agreed by the Council; or e) A suitable replacement habitat is provided on a like for like basis on or broadly close to the site which is agreed and secured through a costed Habitat Management and Monitoring Plan; or f) Where it can be demonstrated that criteria d and e is not appropriate, a smaller suitable habitat replacement area is agreed and secured in perpetuity through a costed Habitat Management and Monitoring Plan and a financial contribution (consistent with the approach taken to mitigating and off-setting adverse effects on the Solent Wader and Brent Geese Network) is provided towards a suitable identified site for Solent Waders and Brent Geese. <u>Low Use</u> Development on Low Use Sites (as shown on the Policies map) will only be permitted where: g) On site mitigation is provided which is agreed by the Council; or h) Where it can be demonstrated that criteria g is not appropriate, a financial contribution (consistent with the approach taken to mitigating and off-setting adverse effects on the Solent Wader and Brent Geese Network) is provided towards a suitable identified site for Solent Waders and Brent Geese. <u>Candidate Sites</u> Development on Candidate Sites (as shown on the Policies map) will only be permitted where: i One or two consecutive year survey is undertaken to determine the classification of the site; and ii Once the classification is established, the above requirements are met according to the status of the site <u>Indirect effects</u> Indirect effects to a Solent Wader and Brent Geese site from development proposals shall be avoided in the first instance or a suitable package of mitigation measures should be agreed and secured. <u>Replacement Habitats</u> Where replacement habitat is required to offset the loss or damage to a Solent Wader and Brent

Incorporated mitigation measures
Geese site, the replacement land will need to be located as close as reasonably possible to the site being adversely affected. The replacement site must already be managed in a suitable condition for waders and/or Brent Geese prior to the loss or damage to the site proposed for development. The replacement land shall be secured and managed in perpetuity, through an agreed and costed Habitat Management and Monitoring Plan.
Policy NE7 New Moorings
New Moorings will be permitted provided that they are located outside of the Mooring Restriction Areas…and where it can be demonstrated that they would not have a significant adverse impact on internationally designated sites…
Policy HP12 Development Proposals within Solent Breezes Holiday Park
Permissions will only be granted for holiday occupation provided all the following criteria are met:… d) Where is can be demonstrated that the proposal will not have an adverse impact on the Solent and Southampton Water Special Protection Area (SPA)…
D4 Water Quality and Resources
The Council together with its partners will seek to improve water quality and manage the use of water resources by ensuring development proposals provide for the satisfactory supply and disposal of surface and wastewater. Development proposals must not be detrimental to the management and protection of river, coastal and groundwater. Opportunities to enhance these resources in line with the Water Framework Directive (WFD) objectives will be supported. To minimise impact on the water environment and adapt to climate change, all new dwellings shall achieve the Optional Technical Housing Standard for water efficiency of no more than 110 litres per person per day. Development that achieves a higher technical standard of 100 litres per person per day will be supported.
Site allocation policies
Proposals shall meet the requirements of Policy NE5 given the site's status for Waders and Brent Geese and be specifically designed to respond to nearby sensitive designated features. Applies to sites: - E2 Faraday Business Park, Daedalus East (ID: 3113) - E3 Swordfish Business Park, Daedalus West (ID: 3114) A Construction Environmental Management Plan (CEMP) to avoid adverse impacts of construction on the Solent designated sites shall be provided. Applies to sites: - HA1 North and South of Greenaway Lane, Warsash (ID:3126) (Part of site has outline approval. CEMP will be requirement of Reserved Matters Application) - HA3 Southampton Road, Titchfield Common (ID:3128) (Part of site already granted outline permission and CEMP conditioned as part of approval) - HA7 Warsash Maritime Academy (ID:3088) - HA12 Moraunt Drive, Portchester (ID:3032) (Resolution to grant planning permission and CEMP conditioned as part of approval) - HA23 Stubbington Lane, Hill Head (ID:1078) (Planning permission already granted and CEMP conditioned as part of approval) - HA31 Hammond Industrial Park, Stubbington Lane (ID: 93) - HA32 Egmont Nursery, Warsash, Warsash (ID: 2890) (Resolution to grant outline planning

Incorporated mitigation measures
permission. CEMP will be requirement of Reserved Matters Application) - HA44 Assheton Court (ID: 3244) - E2 Faraday Business Park, Daedalus East (ID: 3113) - E3 Swordfish Business Park, Daedalus West (ID: 3114) - Rapid Transit Scheme at Delme Roundabout - A27 Porchester The design of proposals (including the scale, form, massing and layout of development) shall be specifically designed to respond to nearby sensitive features (i.e. EU sites or BG/wader sites), through for example reduced or stepped building heights, to avoid displacing BG/waders as result of reduced sight lines. Applies to sites: - HA7 Warsash Maritime Academy (ID:3088) - E2 Faraday Business Park, Daedalus East (ID: 3113) - E3 Swordfish Business Park, Daedalus West (ID: 3114)

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6 Identifying Impact Pathways

6.1 Introduction

6.1.1 This chapter discusses the available evidence relating to the pathways of impact to European sites as identified during HRA screening for the Draft Plan and re-assessed during screening for the Publication Plan. Table 6.1 sets out those pathways which are considered to result in likely significant effects for each of the European sites, not taking account of mitigation, and hence are taken forward for Appropriate Assessment in Chapter 7. The full results of the screening assessment, including the screening of the proposed policies of the Publication Plan, are provided in Appendix II.

Table 6.1: Likely Significant Effects to European Sites

	Butser Hill SAC	Solent & IoW Lagoons SAC	River Itchen SAC	Solent Maritime SAC	The New Forest SAC/Ramsar	Chichester & Langstone Harbours	Portsmouth Harbour SPA/Ramsar	Solent & Dorset Coast SPA	Solent & Southampton Water SPA/Ramsar	The New Forest SPA
Atmospheric pollution			✔	✔	✔		✔	✔	✔	✔
Coastal squeeze										
Disturbance						✔	✔		✔	
Water Abstraction										
Water Pollution				✔					✔	
Site specific impacts				✔			✔	✔	✔	

6.2 Atmospheric Pollution

Impact mechanisms

6.2.1 Atmospheric pollution is a widespread issue, with background air quality heavily influenced by large point-source emitters including transboundary sources. Local pollutant sources can also affect designated sites, particularly in relation to protected habitats within SACs, and especially

from road traffic emissions. The Local Plan cannot feasibly influence causes of background pollution such as large point sources but, through the scale of development proposed, road network and sustainable transport measures will affect the way in which locally emitted pollutants reach each site.

6.2.2 The following descriptions draw on information presented through the Air Pollution Information Systems (APIS)[15] and the Institute of Air Quality Management (IAQM) guidance[16]. The main pollutants affecting vegetation are:

- nitrogen oxides (NO_X) produced through combustion processes, with half of UK emission from road traffic; and
- ammonia (NH_3), the main source of which is agriculture (e.g. manures and fertilisers).

6.2.3 These gases can result in direct effects to vegetation through exposure, and indirect effects through deposition to soil and freshwater (dry deposition) or with precipitation (wet deposition).

6.2.4 Direct exposure of vegetation to NOx and NH_3 has phytotoxic effects, especially in areas close to sources, such as roadside verges; lichens and bryophytes (which include mosses, landworts and hornwarts) are particularly vulnerable to these sorts of toxic effects, which can result in changes to plant growth, changes in the plant's ability to assimilate CO_2, and biochemical effects.

6.2.5 Indirect effects through deposition include:

- Acid deposition: acid deposition is most likely to affect vegetation indirectly through changes to soil properties. NOx and ammonium (from NH_3) react with rain/cloudwater to form nitric (or sulphuric) acid. Increases in soil acidity can increase the mobility of certain toxic metals which can result in root damage, stunted growth and reduced microbial activity. These effects can lead to changes in species composition.
- Eutrophication by nitrogen deposition: dry deposition of NOx is greatest within large conurbations and close to major roads. Whilst nitrogen is essential for plant growth, excessive amounts can become toxic, as instead of acting as a nutrient, nitrogen becomes a pollutant. Many semi-natural plants (including bryophytes) do not have the capacity to assimilate nitrogen when excess nitrogen is available and can therefore be outcompeted by plants that can (such as many grass species), through shading to inability to compete for other limiting resources. Overall this can lead to long term compositional changes in vegetation and reduced diversity. For example a marked decline in heather and an increased dominance of grasses have been observed throughout the Netherlands and also in the East Anglian Brecklands (see for example Bobbink et al (1993) and Pitcairn et al (1991)).

6.2.6 Over half of all emissions of nitrogen and nitrogen oxides in the UK are the result of vehicle exhausts, with an estimated 92% of those associated with residential development being contributed by road traffic (Dore *et al*, 2005). Nitrogen emissions from traffic generated by

[15] Online at: http://www.apis.ac.uk/ [Accessed 14/8/19]

[16] Institute of Air Quality Management (2019): *A guide to the assessment of air quality impacts on designated nature conservation sites, June 2019*. Accessed [14/8/19] online at: https://iaqm.co.uk/text/guidance/air-quality-impacts-on-nature-sites-2019.pdf

residential and commercial developments will therefore be the focus of this part of the assessment.

Critical loads and levels

6.2.7 Critical loads and levels are a tool for assessing the risk of air pollution impacts to ecosystems Critical loads are defined as the "*deposition flux of an air pollutant below which significant harmful effects on sensitive ecosystems do not occur according to present knowledge*"[17]. Critical levels are defined as "*the concentration of an air pollutant above which adverse effects on ecosystems may occur*"[18]. Critical loads concern the quantity of pollutants deposited from the air to the ground (for example nitrogen deposition and acid deposition), whilst critical levels concern the gaseous concentration of a pollutant in the air (for example nitrogen oxides). Critical loads are assigned to habitat classes of the European Nature Information System (EUNIS) to enable consistency of habitat terminology and understanding across Europe. Critical loads are given as ranges (e.g. 10-20 kgN/ha/yr) (APIS, 2019). Critical levels are not habitat specific but have been set to cover broad vegetation types (e.g. forest arable, semi-natural), often with critical values set for sensitive lichens and bryophytes (APIS, 2019). Critical levels for the different pollutants have been derived from experiments and observation that show varied effects on vegetation (APIS, 2019).

Ricardo Air Quality HRA

6.2.8 A Ricardo study[19] published in 2020 on behalf of Fareham Borough Council predicted air quality impacts for all European designated sites within a 10km study area around Fareham Borough, based on modelled annual average airborne concentrations of NOx and NH_3, as well as the annual deposition of nutrient nitrogen and acid.

6.2.9 The study was based on a Transport Assessment of housing numbers prior to the reductions in housing need introduced as a result of the August 2020 Government consultation proposing further changes to the method of calculating housing need. The traffic levels taken into account in the Ricardo study are therefore likely to be higher than those associated with the housing supply conferred by the Publication Plan. Therefore the Ricardo study, and the subsequent conclusions of this HRA in respect of air pollution effects associated with the Local Plan, are considered to be more precautionary than would normally be the case.

6.2.10 Predicted pollutant concentrations were modelled using a sub-regional air dispersion model (RapidAir) for three traffic scenarios in order to assess potential air quality impacts of the Fareham Local Plan:

- Reference Case (2015): This scenario was used to replicate 2015 traffic conditions within Fareham and verify the performance of the air dispersion model;
- Do Nothing (2036): This scenario includes all known current (as of 2019) completed development and infrastructure within Fareham, in addition to all committed development and infrastructure up to 2036. Development associated with the Fareham Local Plan is not

[17] *Ibid.*

[18] *Ibid.*

[19] Ricardo (2020): *Air Quality Habitat Regulations Assessment for the Fareham Borough Local Plan 2036*. July 2020

included in this scenario. Outside of Fareham, development growth is assumed to continue as 'normal' in accordance with adopted Local Plans for neighbouring boroughs and in accordance with TEMPRO v7.2 growth projections;

- Do Minimum (2036): This scenario includes the Fareham Local Plan housing and employment development prior to the August 2020 changes in housing need but assumes there will be no further improvements to the transport network, aside from those which are already committed and therefore already included in the Fareham 2036 'Do Nothing' scenario. Development growth outside Fareham is identical to that included in the Fareham 2036 'Do-Nothing' scenario.

In combination effects

6.2.11 A fourth and fifth scenario were used to assess in-combination effects arising from emerging local plans in neighbouring PfSH authorities:

- PfSH 2036 Baseline: This scenario represents a future scenario without the proposed PfSH development, and it has all land use growth inputs removed from the PfSH sub-region from 2014 onwards. The scale and location of development are assumed to be unchanged from 2014 conditions within the PfSH sub-region.
- PfSH 2036 Do Minimum: This scenario includes development and growth within the PfSH region, equating to approximately 120,000 additional dwellings compared to the 2036 Baseline scenario. It includes transport schemes that are already committed as well as several supporting schemes that are vital to committed development sites even though the schemes themselves may not yet be committed. This scenario includes development in Fareham on the scale of that included in the Fareham Local Plan prior to the August 2020 changes in housing need and represents a precautionary approach to the assessment of in combination air quality impacts associated with development across the PfSH sub-region.

6.2.12 Traffic growth within the wider PfSH sub-region was provided by the Solent Transport's Sub-Regional Transport Model (SRTM) and the outputs from the air dispersion modelling were scaled from the year 2034 to the year 2036.

Site sensitivity to atmospheric pollution

6.2.13 The Ricardo (2020) Air Quality HRA identifies the qualifying features for each designated site which are sensitive to atmospheric pollution associated with planned development, either through direct exposure to NOx and NH_3 or via nitrogen and acid deposition. This information was obtained through APIS. At the screening stage, the spatial distribution of qualifying features within each designated site was not considered. If a potentially sensitive feature was identified at the designated site, as determined by APIS listing a critical load or critical level for at least one pollutant associated with road traffic at that site, it was included in the subsequent stages of the study.

6.2.14 Table 6.2 sets out the qualifying features for each designated site together with the applicable critical loads for deposition and critical level for airborne pollutants. The critical level for airborne NOx is set at 30 µg/m3 across all designated sites.

Table 6.2: European Site Minimum Critical Load and Critical Level Values and Associated Sensitive Features

Sensitive Feature	Minimum Nutrient Nitrogen Deposition Critical Load (kg N/ha/yr)	Minimum Acid Deposition Critical Load (MinCLMaxN, kEq/ha/year)	Minimum Airborne NH_3 Critical Level (µg/m³)
Chichester and Langstone Harbours SPA / Ramsar			
Sterna sandvicensis (Western Europe/Western Africa) - Sandwich tern	8	1.123	3
Sterna hirundo (Northern/Eastern Europe - breeding) - Common tern	8	1.123	3
Sterna albifrons (Eastern Atlantic - breeding) - Little tern	8	1.123	3
Tadorna tadorna (North-western Europe) - Common shelduck	20	Not sensitive	3
Anas penelope (Western Siberia/North-western/North-eastern Europe) - Eurasian wigeon	20	Not sensitive	3
Anas crecca (North-western Europe) - Eurasian teal	20	Not sensitive	3
Anas acuta (North-western Europe) - Northern pintail	20	Not sensitive	3
Mergus serrator (North-western/Central Europe) - Red-breasted merganser	20	Not sensitive	3
Charadrius hiaticula (Europe/Northern Africa - wintering) - Ringed plover	20	Not sensitive	3
Pluvialis squatarola (Eastern Atlantic - wintering) - Grey plover	20	Not sensitive	3
Calidris alba (Eastern Atlantic/Western & Southern Africa - wintering) - Sanderling	20	Not sensitive	3
Limosa lapponica (Western Palearctic - wintering) - Bar-tailed godwit	20	Not sensitive	3
Numenius arquata (Europe - breeding) - Eurasian curlew	20	1.123	3

Sensitive Feature	Minimum Nutrient Nitrogen Deposition Critical Load (kg N/ha/yr)	Minimum Acid Deposition Critical Load (MinCLMaxN, kEq/ha/year)	Minimum Airborne NH_3 Critical Level (µg/m³)
Tringa totanus (Eastern Atlantic - wintering) - Common redshank	20	Not sensitive	3
Arenaria interpres (Western Palearctic - wintering) - Ruddy turnstone	20	Not sensitive	3
Anas clypeata (North-western/Central Europe) - Northern shoveler	No data	No data	3
New Forest SPA			
Caprimugulus europaeus - European nightjar	5	0.862	3
Lulla arborea - Wood lark	5	0.862	3
Pernis apivorus - European honeybuzzard	10	1.062	3
Circus cyaneus - Hen harrier	10	0.862	3
Falco subbuteo - Eurasian hobby	10	0.862	3
Sylvia undata - Dartford warbler	10	0.862	3
Phylloscopus sibilatrix - Wood warbler	10	1.062	3
The New Forest SAC			
Oligotrophic to mesotrophic standing waters with vegetation of the Littorelletea uniflorae and/or of the Isoeto-Nanojuncetea	3	No CL found on APIS	3; APIS indicates no lichens or bryophytes present
Oligotrophic waters containing very few minerals of sandy plains (*Littorelletalia uniflorae*)	5	No CL found on APIS	3; APIS indicates no lichens or bryophytes present
Bog woodland	5	0.547	Site specific advice should be sought; APIS indicates lichens and bryophytes are present
Transition mires and quaking bogs	10	0.547	1

Sensitive Feature	Minimum Nutrient Nitrogen Deposition Critical Load (kg N/ha/yr)	Minimum Acid Deposition Critical Load (MinCLMaxN, kEq/ha/year)	Minimum Airborne NH_3 Critical Level (µg/m³)
Depressions on peat substrates of the *Rhynchosporion*	10	0.547	1
Old acidophilous oak woods with *Quercus robur* on sandy plains	10	1.062	Site specific advice should be sought; APIS indicates lichens and bryophytes are present
Northern Atlantic wet heaths with *Erica tetralix*	10	0.862	1
European dry heaths	10	0.862	1
Atlantic acidophilous beech forests with Ilex and sometimes also Taxus in the shrublayer *(Quercion robori-petraeae or Ilici-Fagenion)*	10	1.062	Site specific advice should be sought; APIS indicates lichens and bryophytes are present
Asperulo-Fagetum beech forests	10	1.062	Site specific advice should be sought; APIS indicates lichens and bryophytes are present
Molinia meadows on calcareous, peaty or clayey-silt-laden soils (*Molinion caeruleae*)	15	0.586	3; APIS indicates no lichens or bryophytes present
Alkaline fens	15	Not sensitive	1
Alluvial forests with Alnus glutinosa and Fraxinus excelsior (*Alno-Padion, Alnion incanae, Salicion albae*)	Not sensitive	Not sensitive	*1*
Coenagrion mercuriale - Southern damselfly	10	0.862	3
Lucanus cervus - Stag beetle	10	1.062	3
Triturus cristatus - Great crested newt	Site specific advice should be sought	No CL found on APIS	3
Portsmouth Harbour SPA / Ramsar			
Branta bernicla bernicla (Western Siberia/Western Europe) - Dark-bellied brent goose	20	Not sensitive	3
Mergus serrator (Northwestern/Central Europe) - Redbreasted merganser	20	Not sensitive	3

Sensitive Feature	Minimum Nutrient Nitrogen Deposition Critical Load (kg N/ha/yr)	Minimum Acid Deposition Critical Load (MinCLMaxN, kEq/ha/year)	Minimum Airborne NH_3 Critical Level (µg/m³)
Calidris alpina alpina (Northern Siberia/Europe/Western Africa) - Dunlin	20	Not sensitive	3
Limosa limosa islandica (Iceland - breeding) - Black-tailed godwit	20	Not sensitive	3
River Itchen SAC			
Water courses of plain to montane levels with the *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation	No data – Species broad habitat sensitive	No data	3; APIS indicates no lichens or bryophytes present
Coenagrion mercuriale - Southern damselfly	15 [a]	Not sensitive [a]	3
Austropotamobius pallipes - White-clawed (or Atlantic stream) crayfish	No data – Site specific advice should be sought	No data – Site specific advice should be sought	3
Lampetra planeri - Brook lamprey	No data – Site specific advice should be sought	No data	3
Salmo salar - Atlantic salmon	No data – Site specific advice should be sought	No data	3
Cottus gobio - Bullhead	No data – Site specific advice should be sought	No data	3
Lutra lutra - Otter	No data – Site specific advice should be sought	No data	3
Solent and Dorset Coast SPA			
No species listed			
Solent and Isle of Wight Lagoons SAC			
Coastal lagoons	20	Not sensitive	3 *
Solent and Southampton Water SPA / Ramsar			
Sterna sandvicensis (Western Europe/Western Africa) -	8	0.626	3

Sensitive Feature	Minimum Nutrient Nitrogen Deposition Critical Load (kg N/ha/yr)	Minimum Acid Deposition Critical Load (MinCLMaxN, kEq/ha/year)	Minimum Airborne NH_3 Critical Level (µg/m³)
Sandwich tern			
Sterna dougallii (Europe - breeding) - Roseate tern	8	0.626	3
Sterna hirundo (Northern/Eastern Europe - breeding) - Common tern	8	0.626	3
Sterna albifrons (Eastern Atlantic - breeding) - Little tern	8	0.626	3
Branta bernicla bernicla (Western Siberia/Western Europe) - Dark-bellied brent goose	20	Not sensitive	3
Anas crecca (North-western Europe) - Eurasian teal	20	Not sensitive	3
Charadrius hiaticula (Europe/Northern Africa - wintering) - Ringed plover	20	Not sensitive	3
Limosa limosa islandica (Iceland - breeding) - Black-tailed godwit	20	Not sensitive	3
Larus melanocephalus - Mediterranean gull	20	Not sensitive	3
Solent Maritime SAC			
Perennial vegetation of stony banks	8	0.626	3; APIS indicates no lichens or bryophytes present
Shifting dunes along the shoreline with *Ammophila arenaria* ("white dunes")	10	Not sensitive	3; APIS indicates no lichens or bryophytes present
Estuaries	20	Not sensitive	3; APIS indicates no lichens or bryophytes present
Coastal lagoons	20	Not sensitive	3; APIS indicates no lichens or bryophytes present
Salicornia and other annuals colonizing mud and sand	20	Not sensitive	3; APIS indicates no lichens or bryophytes present
Spartina swards (*Spartinion maritimae*)	20	Not sensitive	3; APIS indicates no lichens or bryophytes present

Sensitive Feature	Minimum Nutrient Nitrogen Deposition Critical Load (kg N/ha/yr)	Minimum Acid Deposition Critical Load (MinCLMaxN, kEq/ha/year)	Minimum Airborne NH_3 Critical Level (µg/m³)
Atlantic salt meadows (*GlaucoPuccinellietalia maritimae*)	20	Not sensitive	Site specific advice should be sought
Sandbanks which are slightly covered by sea water all the time	Not sensitive	Not sensitive	Not sensitive
Mudflats and sandflats not covered by seawater at low tide	No data	Not sensitive	3; APIS indicates no lichens or bryophytes present
Annual vegetation of drift lines	Not sensitive	Not sensitive	Not sensitive
Vertigo moulinsiana - Desmoulin`s whorl snail	No data – site specific	No data – site specific	3

** Not listed on APIS; value indicated by Natural England via email*

Effects Associated with the Fareham Local Plan

6.2.15 The Ricardo (2020) Air Quality HRA used the dispersion modelling results to calculate the contribution of development traffic associated with the Fareham Local Plan. In the first instance, the contribution of the Fareham Local Plan in isolation was calculated. Contributions were compared to a screening threshold of 1% of the applicable critical load or critical level (CL). This approach is supported by online guidance published by Defra and the Environment Agency, a position statement published by the IAQM, and guidance previously received from Natural England. The 1% criterion is intended to be a threshold below which significant effects are unlikely and the impact can therefore be screened out; impacts above 1% do not necessarily correspond to the onset of damage to a designated site but are treated as potentially significant and hence were taken forward for Appropriate Assessment. Where the contributions associated with the Fareham Local Plan in isolation are less than 1% but above zero, likely significant effects for the Local Plan in combination with PfSH development could occur and therefore these impacts were taken forward for Appropriate Assessment.

6.2.16 Those sites where the contributions of the Fareham Local Plan in isolation exceeded the 1% screening threshold included:

- Portsmouth Harbour SPA/Ramsar – 2.72% of CL for Airborne NOx;
- River Itchen SAC
    - 1.62% of CL for Nitrogen Deposition on Forest habitat type, and
    - 1.06% of CL for Nitrogen Deposition on Grassland habitat type; and
- Solent and Dorset Coast SAC
    - 4.96% of CL for Nitrogen Deposition on Grassland habitat type,
    - 4.51% of CL for Acid Deposition on Grassland habitat type,
    - 4.17% of CL for Airborne NOx, and
    - 2.07% of CL for Airborne NH_3.
- Solent Maritime SAC
    - 4.96% of CL for Nitrogen Deposition on Grassland habitat type,
    - 4.51% of CL for Acid Deposition on Grassland habitat type,
    - 4.17% of CL for Airborne NOx, and
    - 2.07% of CL for Airborne NH3.

6.2.17 Those sites where the contributions of the Fareham Local Plan in isolation did not exceed the 1% screening threshold but were greater than zero and hence there was potential for in-combination effects included:

- New Forest SPA for all four pollutants;
- New Forest SAC for all four pollutants;
- Portsmouth Harbour SPA/Ramsar for Nitrogen Deposition on Grassland and Airborne NH_3;

- River Itchen SAC for Airborne NOx and Airborne NH_3; and
- Solent and Southampton Water SPA/Ramsar for all four pollutants.

6.2.18 The results of the air quality screening assessment are summarised in Table 6.3. As noted in section 6.2.9, the conclusions are considered more precautionary than would normally be the case, as the traffic levels forming the basis of the Ricardo study do not take into account the reductions in housing need for the Borough associated with the Government's further proposed changes to the method for calculating housing need. Those impact pathways highlighted in orange (likely significant effect in combination) and red (likely significant effect in isolation) have been taken forward for Appropriate Assessment in Chapter 7.

Table 6.3: Air Quality Screening Assessment Results

Designated Site	Nitrogen deposition	Acid deposition	Airborne NOx	Airborne NH_3
Chichester & Langstone Harbours SPA/Ramsar	Screened out	Screened out	Screened out	Screened out
New Forest SPA	Screened in – isolation contribution<1% but >0%	Screened in – isolation contribution<1% but >0%	Screened in – isolation contribution<1% but >0%	Screened in – isolation contribution<1% but >0%
The New Forest SAC	Screened in – isolation contribution<1% but >0%	Screened in – isolation contribution<1% but >0%	Screened in – isolation contribution<1% but >0%	Screened in – isolation contribution<1% but >0%
Portsmouth Harbour SPA/Ramsar	Screened in – isolation contribution<1% but >0%	n/a	Screened in – isolation contribution >1%	Screened in – isolation contribution<1% but >0%
River Itchen SAC	Screened in – isolation contribution >1%	n/a	Screened in – isolation contribution<1% but >0%	Screened in – isolation contribution<1% but >0%
Solent & Dorset Coast SPA	Screened in – isolation contribution >1%	Screened in – isolation contribution >1%	Screened in – isolation contribution >1%	Screened in – isolation contribution >1%
Solent & Isle of Wight Lagoons SAC	Screened out	Screened out	Screened out	Screened out
Solent & Southampton Water SPA/Ramsar	Screened in – isolation contribution<1% but >0%	Screened in – isolation contribution<1% but >0%	Screened in – isolation contribution<1% but >0%	Screened in – isolation contribution<1% but >0%
Solent Maritime SAC	Screened in – isolation contribution >1%	Screened in – isolation contribution >1%	Screened in – isolation contribution >1%	Screened in – isolation contribution >1%

6.3 Coastal Squeeze

Impact mechanism

6.3.1 Coastal habitats naturally migrate landward as sea levels rise over time and where there are no barriers preventing this. Coastal squeeze occurs when manmade structures, such as sea defences, prevent landward migration and therefore the coastal habitat is squeezed against the manmade structure and eventually lost. The European designated sites along the Solent are at risk from the loss and fragmentation of their qualifying habitats due to this phenomenon.

6.3.2 The Fareham Borough coastline falls under the North Solent Shoreline Management Plan (SMP)[20], and includes policy units 5b02, 5b03, 5c01, 5c02, 5c03 and 5c04 as shown on Figure 6.2 and Figure 6.3. For the majority of Fareham's coastline the North Solent SMP policy is 'Hold the Line' (HTL) apart from the two Coastal Change Management Areas (CCMAs) (Figure 6.1), and a section of the East bank of the River Hamble which have a Shoreline Management Plan policy of 'No Active Intervention' (Table 6.4). A policy of HTL means the existing level of protection will be maintained and upgraded where it is economically viable to do so, in order to protect life and property along the extensively developed sections of the estuaries (NFDC, 2010). This policy however has potential impacts on designated sites via coastal squeeze.

Table 6.4: Shoreline Management Policies for Units in Fareham

Policy Unit	Policy Unit Name	Epoch 1 0-20 yrs (up to 2025)	Epoch 2 20-50 yrs (2025 to 2055)	Epoch 3 50-100 yrs (2055 to 2105)
5a21	Farlington Marshes to Cador Drive	HTL	HTL	HTL
5a22	Cador Drive to A27	HTL	HTL	HTL
5a23	A27 to Fleetlands	HTL	HTL	HTL
5b02	Gilkicker Point to Meon Road, Titchfield Haven	HTL	HTL	HTL
5b03	Meon Road, Titchfield Haven to Hook Park	NAI with localised HTL for cross-Solent infrastructure	NAI with localised HTL for cross-Solent infrastructure	NAI with localised HTL for cross-Solent infrastructure
5c01	Hook Park to Warsash North	NAI	MR	HTL
5c02	Warsash North to Swanwick Shore Road	NAI	NAI	NAI
5c03	Swanwick Shore Road to Bursledon Bridge	HTL	HTL	NAI
5c04	Bursledon Bridge to Botley & Curbridge to Satchell Marshes	NAI	NAI	NAI

HTL = Hold the Line – maintain or upgrade level of protection provided by defences; MR = Managed Realignment – allowing the shoreline to move backwards or forwards, with management to control or limit movement; NAI = No Active Intervention – no investment in providing or maintaining defences.

[20] North Solent SMP: Accessed online at http://www.northsolentsmp.co.uk/ [27/8/19]

Fareham Local Plan

- Coastal Change Management Area
- Spatial Planning Areas
- Borough

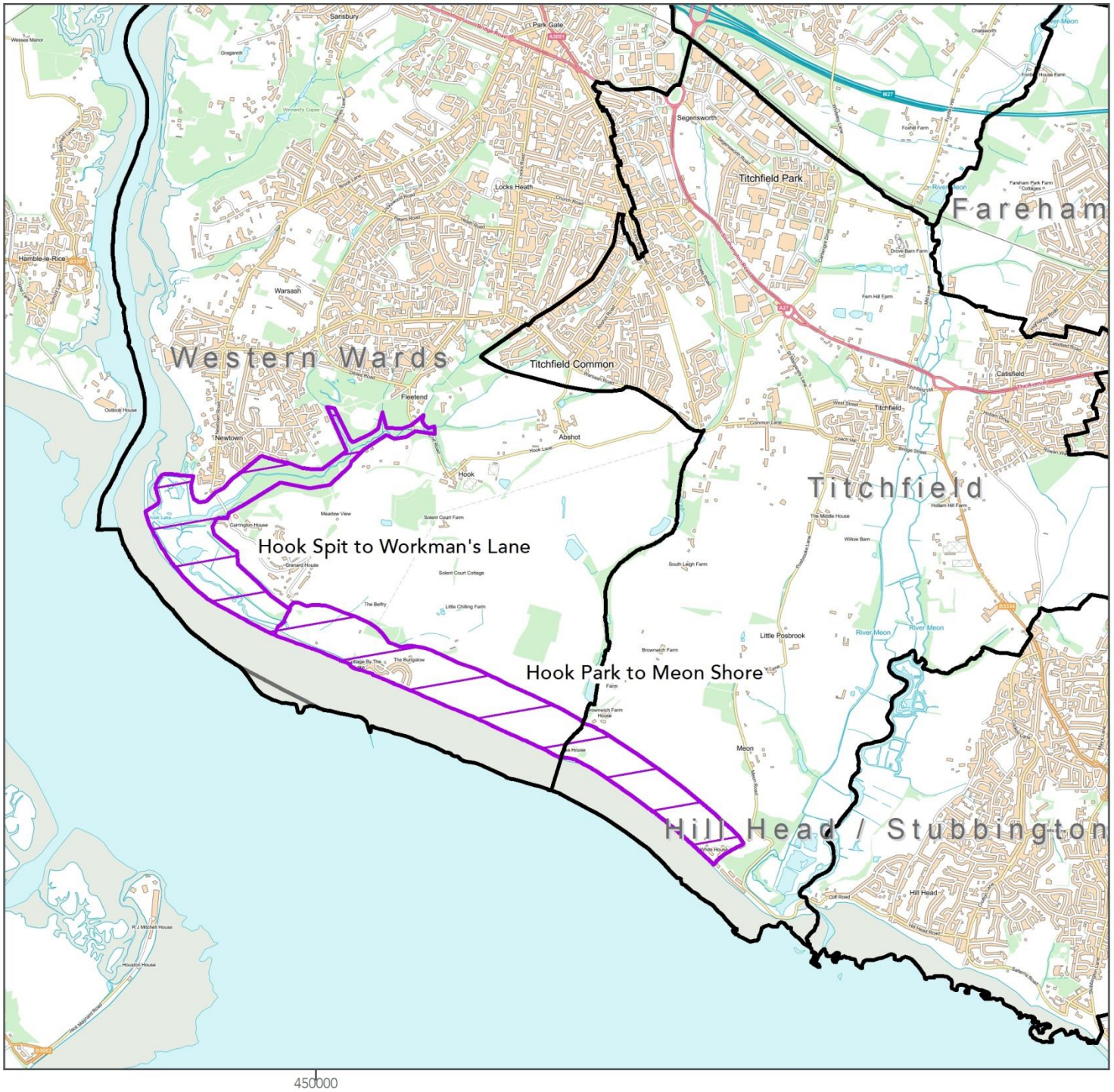

Figure 6.1: Coastal Change Management Areas

0 1 2
Kilometers

N

Scale: 1:40,000 **Created by:** JC
Date: Feb 2020 **Reviewed by:** GC
Drawing number:
UE-0192_HRA_CCMA_200225

URBAN EDGE ENVIRONMENTAL CONSULTING
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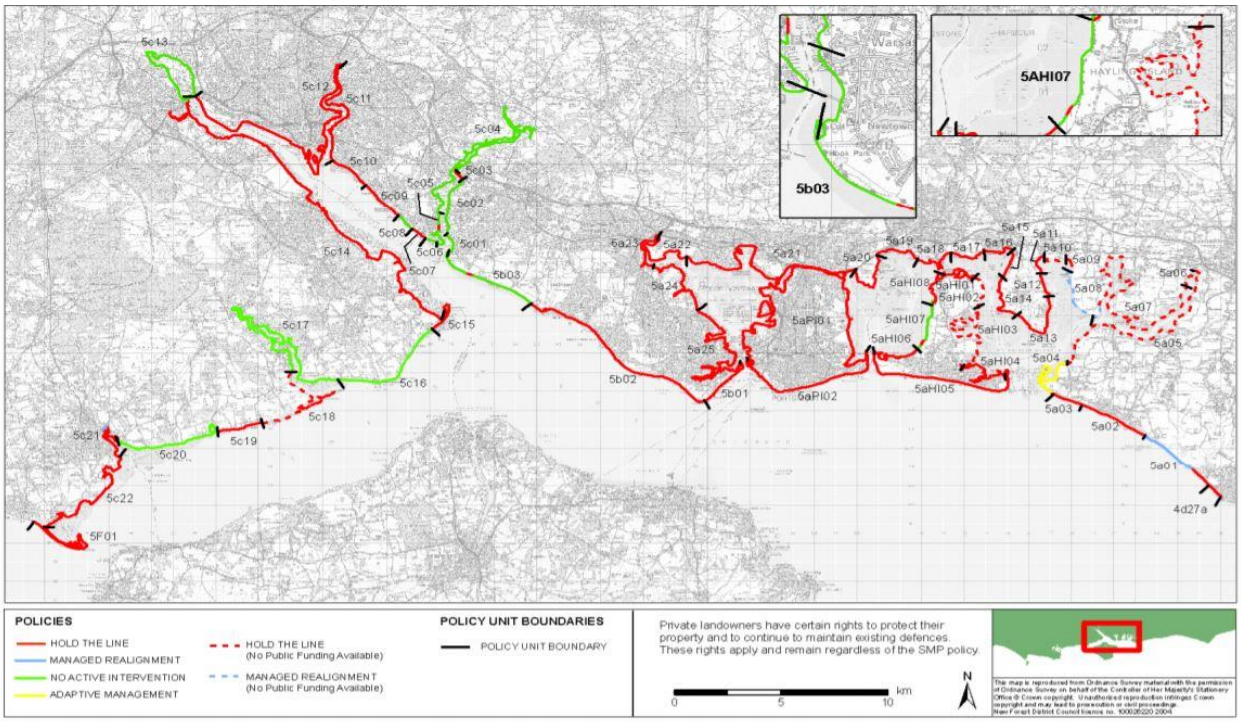

Figure 6.2: SMP Policy Units for Epoch 1 up to 2025

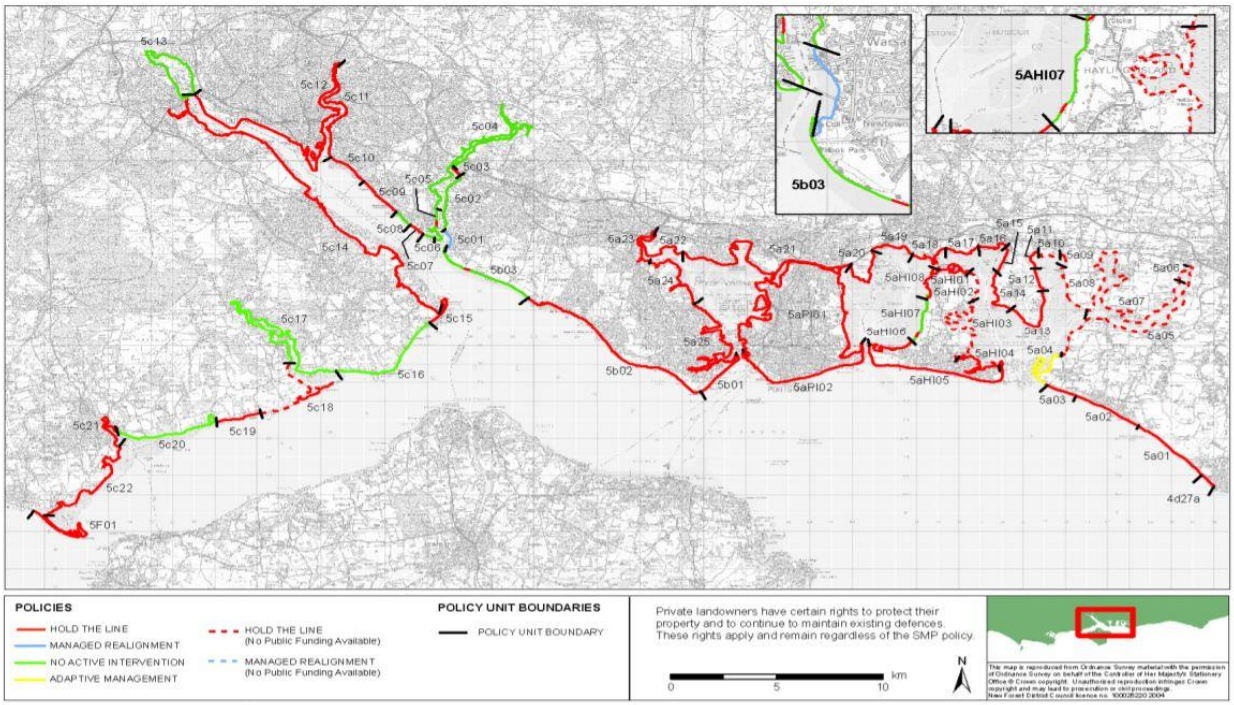

Figure 6.3: SMP Policy Units for Epoch 2, 2025 to 2055

6.3.3 Coastal management in Fareham Borough is managed by the Eastern Solent Coastal Partnership (ESCP), a partnership of four local authorities[21] set up to jointly oversee coastal

[21] Fareham Borough Council, Gosport Borough Council. Havant Borough Council and Portsmouth City Council

flood and erosion risk across the 162km of coastline from the River Hamble to Chichester Harbour. Fareham's coastline is covered by three coastal defence strategies produced by the ESCP implementing the policies of the North Solent SMP:

- The River Hamble to Portchester Coastal Strategy[22];
- Itchen to Hamble coastal defence strategy, which extends to the eastern bank of the River Hamble as far upstream as the Bursledon railway bridge in Fareham Borough; and
- Portchester Castle to Emsworth draft coastal flood and erosion risk management strategy.

6.3.4 There are two CCMAs in Fareham Borough (Figure 6.1) where 'No Active Intervention' is the coastal management policy identified in the North Solent SMP. A CCMA is defined in the NPPF as *"an area identified in plans as likely to be affected by physical change to the shoreline through erosion, coastal landslip, permanent inundation or coastal accretion"*[23]. The CCMAs in Fareham Borough are Hook Spit to Workman's Lane, designated due to permanent flooding, and Hook Park to Meon Shore (including Solent Breezes and Chilling Cliffs), designated due to coastal erosion. Development in both areas is constrained by Policy CC3, which states that *"planning applications for development within the Coastal Change Management Areas…will only be permitted where it can be demonstrated that it will not result in an increased risk to life or significantly increase the risk to any property…Proposals for new or replacement coastal defence schemes will only be permitted where it can be demonstrated that the works are consistent with the relevant Shoreline Management Plan and that there will be no severe adverse impact on the environment."*

6.3.5 The Local Plan area encompasses the entire Fareham coastline and consequently, designated habitats, including intertidal mudflat and coastal saltmarsh, running along the coastline and the River Hamble in areas outside of the CCMAs which are subject to HTL policy during Epoch 1 or Epoch 2 (during which the plan period occurs) could be affected directly by new sea defences intended to protect existing and new development and indirectly through coastal squeeze.

Extent of current and future impacts

6.3.6 The Site Improvement Plan for the Solent[24], which covers the Solent and Southampton Water SPA/Ramsar, Portsmouth Harbour SPA/Ramsar, Chichester and Langstone Harbours SPA/Ramsar and Solent Maritime SAC, highlights coastal squeeze as a current threat to these sites resulting in the direct loss of habitats within the SAC; there is also an impact on birds due to the loss of habitat for feeding, roosting and breeding. In some areas rising sea levels will result in coastal grasslands being lost to more saline grasslands, thus losing habitat for some breeding waders of the waterbird assemblage.

6.3.7 The Appropriate Assessment accompanying the North Solent SMP identified that HTL policies are likely to have significant detrimental effects on intertidal habitats and vegetated shingle

[22] ESCP (2016): River Hamble to Portchester Coastal Strategy, March 2016. Accessed online at http://www.escp.org.uk/Strategy [27/8/19]

[23] DCLG (2019): National Planning Policy Framework, Annex 2: Glossary. Accessed online [27/08/19]

[24] Natural England (2014): Site Improvement Plan – Solent. Accessed online [10/12/19] at: http://publications.naturalengland.org.uk/publication/4692013588938752?category=6149691318206464

backed by a seawall within the Solent and Southampton Water SPA/Ramsar and Solent Maritime SAC, causing loss through coastal squeeze. MR policies, such as those within policy unit 5c01 for Epoch 2, were found not likely to have a significant detrimental effect on mudflat and saltmarsh habitat such as is found in that locality but to have a beneficial effect by creating new intertidal habitat. NAI policies, such as those within policy units 5b03, 5c01, 5c02 and 5c04 for Epochs 1 and 2, were found not likely to have a significant detrimental effect on mudflat habitat and saltmarsh but also have a beneficial effect by creating new intertidal habitat and delivering new sediment to sand and shingle habitats.

6.3.8 The habitats that are lost can be created elsewhere; the neutral grassland habitats will take a long time to create as mitigation, but intertidal habitat can be created relatively quickly[25]. Intertidal habitat losses and gains were quantified for the North Solent SMP Appropriate Assessment using the findings from the Solent Dynamic Coast Project (SDCP) (SDCP, 2008). Table 6.5, Table 6.6, and Table 6.7 summarise the findings of the assessment in relation to estimated habitat loss within each of the affected designated sites within Fareham Borough over the next 100 years.

Table 6.5: Habitat losses and gains in the Solent and Southampton Water SPA / Ramsar as a result of SMP policies (Source: NFDC, 2010, Appendix J, p.64)

SMP habitat grouping	**Habitat change (ha)**			**Mitigation (ha)**			**Total change (ha)**	**Compensation required (ha)**
	Epoch 1	Epoch 2	Epoch 3	Epoch 1	Epoch 2	Epoch 3		
Mudflat	21	62	60	0	26	36	205	0
Saltmarsh	-34	-83	-106	0	20	15	-187	187

Table 6.6: Habitat losses and gains in the Portsmouth Harbour SPA / Ramsar as a result of SMP policies (Source: NFDC, 2010, Appendix J, p.71)

SMP habitat grouping	**Habitat change (ha)**			**Mitigation (ha)**			**Total change (ha)**	**Compensation required (ha)**
	Epoch 1	Epoch 2	Epoch 3	Epoch 1	Epoch 2	Epoch 3		
Mudflat	-12	-43	-105	0	0	0	-160	160
Saltmarsh	-16	-11	-7	0	0	0	-34	34

Table 6.7: Habitat losses and gains in the Solent Maritime SAC as a result of SMP policies (Source: NFDC, 2010, Appendix J, p.83)

SMP habitat grouping	**Habitat change (ha)**			**Mitigation (ha)**			**Total change (ha)**	**Compensation required (ha)**
	Epoch 1	Epoch 2	Epoch 3	Epoch 1	Epoch 2	Epoch 3		
Mudflat	55	77	-3	0	13	0	142	0
Saltmarsh	-108	-159	-163	0	10	0	-419	419

6.3.9 There are opportunities within the North Solent SMP for intertidal habitat creation as a result of MR polices and NAI policies, as shown in Figure 6.4. These sites will provide new intertidal habitat within European designated sites that can be used to mitigate intertidal losses occurring

[25] *Ibid*

within the same designated site. Habitat losses which could not be mitigated through the SMP policies within the European sites were passed onto the Regional Habitat Creation Programme (RHCP)[26] for delivery as compensation.

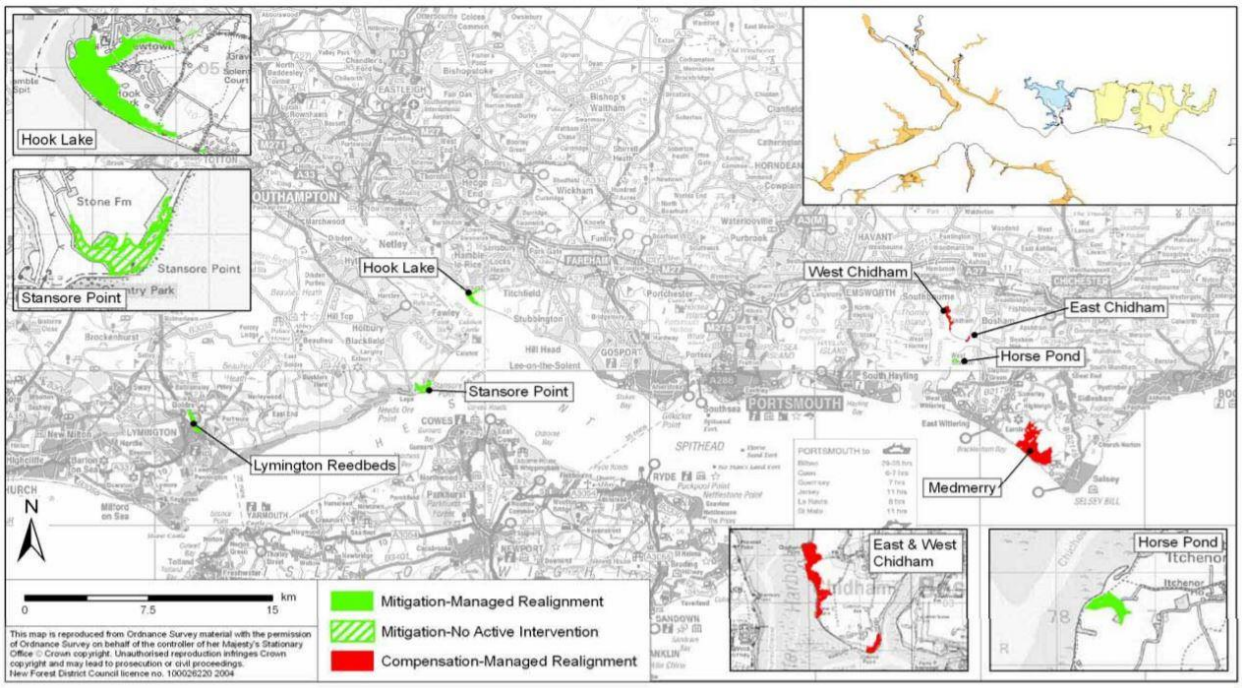

Figure 6.4: Mitigation and Compensation Opportunities for NAI and MR sites across the North Solent

6.3.10 Figures provided by the RHCP are combined for compensation of both the North Solent SMP and the Isle of Wight SMP. Figure 6.5 shows the cumulative habitat balance following completion of compensation schemes at Lymington, Medmerry and Manor House Farm. The RHCP targets for Epoch 1 have nearly been met, with a remaining 20 ha of saltmarsh compensation outstanding. The RHCP has identified potential sites in the Solent and South Downs area for saltmarsh habitat creation opportunities and the Environment Agency and the ESCP are working to progress the best sites for habitat creation[27]. Further investigation is required for Epoch 2, into which the Local Plan period extends, as set out in the Solent Site Improvement Plan.

[26] https://southerncoastalgroup.org.uk/regional-habitat-creation-programme/

[27] *Ibid*

SMP Habitat Group	Cumulative Habitat Balance (Ha)		
	Epoch 1 (2005 - 2025)	Epoch 2 (2026 - 2055)	Epoch 3 (2056 - 2105)
Intertidal Mudflats	43	115	11
Saltmarsh	-20	-169	-335
Coastal Grazing Marsh	69	-1	-7
Freshwater Habitats	16	12	12
Saline Lagoons	0	0	0

Figure 6.5: Solent and South Downs RHCP cumulative habitat balance (RHCP, 2018)

Effects Associated with the Fareham Local Plan

6.3.11 The current policies in the North Solent SMP will result in a loss of intertidal habitat, although this loss will be compensated by the RHCP. Development as part of the Fareham Local Plan which is in compliance with the North Solent SMP policies is therefore considered to be neutral in terms of effects to European sites from coastal squeeze and this pathway is screened out from Appropriate Assessment.

6.3.12 However, any development which necessitates a change to the North Solent SMP policies, such as land reclaiming, will increase impacts associated with coastal squeeze to European sites in the Solent. This includes the introduction of new defences or a coastal management strategy that involves advancing the line.

In combination effects

6.3.13 The SMP sets the coastal defence policy for the entire north Solent region and combined losses of intertidal habitat are compensated through the RHCP. Therefore the assessment of in-combination effects is integral the SMP.

6.4 Disturbance: Strategic Effects

Impact mechanisms

6.4.1 Population growth associated with residential development brings with it the prospect of additional visitor pressure on European sites. There is particular concern over the capacity of existing open spaces adjacent to or within European sites to accommodate additional visitor pressure resulting from planned residential development, and development and promotion of tourism (particularly along the coast), without adverse effects on European site integrity, particularly those designated for an internationally important bird assemblage.

Bird disturbance

6.4.2 Impacts associated with disturbance from recreation differ between seasons, species, and individuals. Birds' responses to disturbance can be observed as behavioural or physiological,

with possible effects on feeding, breeding and taking flight. Murison *et al.* (2007) noted that birds often react to human disturbance as a form of predation risk. Such a response can include elevated heart rate, heightened defensive behaviour, including evasive measures, and the avoidance of high risk areas (Murison *et al.* (2007), Liley & Sutherland (2007)). High levels of human activity in important nature conservation areas might then change the behaviour of animals to such a degree that conservation priorities become compromised. This may result from reduced breeding success, increased energetic expenditure, predation, or exposure of nests, eggs or young to trampling and the elements (Liley & Sutherland, 2007).

6.4.3 Disturbance can be caused by a wide variety of activities and, generally, both distance from the source of disturbance and the scale of the event will influence the nature of the response. Factors such as habitat, food requirements, breeding behaviour, cold weather, variations in food availability and flock size, will influence birds' abilities to respond to disturbance and hence the scale of the impact (Stillman *et al,* 2009). On the other hand, birds can modify their behaviour to compensate for disturbance, for example by feeding for longer time periods. Some birds can become habituated to particular disturbance events or types of disturbance, and this habituation can develop over short time periods (Stillman *et al,* 2009)

6.4.4 In coastal areas it can be helpful to divide impacts into the effects of disturbance on overwintering birds, or on breeding birds. Impacts to wintering birds are centred on interruption to foraging or roosting. Individuals alter their threshold in response to shifts in the basic trade-off between increased perceived predation risk (tolerating disturbance) and the increased starvation risk of not feeding or increased energetic expenditure (avoiding disturbance) (Stillman *et al*, 2009). During the breeding season, impacts on shorebirds arise from increased predation of eggs, as well as trampling and increased thermal stress, when birds flush the nest in response to a disturbance event, leading to reduced breeding success (Stillman *et al*, 2009).

6.4.5 At the New Forest SPA, it is the ground and near-ground nesting birds that are particular receptors of negative effects, such as Dartford Warbler, Nightjar and Woodlark. Studies by Langston *et al,* (2007), Liley and Clarke (2003), and Murison (2002) investigated the effect of disturbance on Nightjar on heaths in Dorset, finding that breeding success of Nightjar is significantly lower close to paths, and that proximity to housing has a negative relationship with the size of the population (Langston *et al*, 2007). The most common cause of breeding failure for this ground-nesting species was due to daytime predation of eggs when disturbance caused an incubating bird to leave the nest.

6.4.6 Similarly, the study by Murison *et al*, (2007) found that for Dartford Warbler on Dorset heathland, disturbance also reduced breeding activity, particularly so in heather-dominated territories. Birds in heavily disturbed areas (e.g., close to access points and car parks) delayed the start of their breeding by up to six weeks, preventing multiple broods and so reducing annual productivity. Most of this disturbance was found to come from dog-walkers as a result of dogs being encouraged to run through the vegetation after sticks.

6.4.7 It has been observed that the removal of human disturbance effects could result in an increase of between 13% and 48% in the breeding population of Woodlark over 16 heathland sites (Mallord *et al.* 2007a, Mallord *et al.* 2007b). At sites with recreational access Woodlark was found

to be less likely to colonise suitable habitat in areas with greater disturbance. The probability of colonisation was reduced to below 50% with disturbance levels at eight events per hour.

Trampling and nutrient enrichment

6.4.8 Increased recreational pressure can also result in habitat trampling, compaction and erosion. The New Forest Site Improvement Plan (Natural England, 2014) identifies disturbance to qualifying Natura 2000 species through compaction, abrasion and other modifications to vegetation, soils and watercourses.

6.4.9 Enriched nutrient levels from canine urine and faeces can also have consequential changes in biodiversity. The local impacts of this impact pathway have not been assessed in detail at the time of writing, however a report commissioned by the Solent Recreation Mitigation Partnership (Stephen Jenkinson, 2016) identified this as a negative impact pathway.

Other plans and projects acting in combination

6.4.10 The following plans/projects identified at the screening stage may also contribute to disturbance impacts:

- Strategic development at Boorley Green, Eastleigh Borough
- Strategic development at West of Waterlooville, Havant Borough
- Strategic development at Tipner and Horsea Island, Portsmouth
- Strategic development at North of Whiteley, Winchester district
- Eastleigh Borough Adopted Local Plan Review 2001-2011 (adopted 2006)
- Eastleigh Borough Draft Local Plan 2011-2036
- Fareham Borough Welborne Plan (adopted 2015)
- Gosport Borough Local Plan 2011 to 2029 (adopted 2015)
- The Portsmouth Plan (adopted 2012)
- Portsmouth City Draft Local Plan 2014-2034
- Winchester District Local Plan Part 1 - Joint Core Strategy (adopted 2013)
- Winchester District Local Plan Part 2 – Development Management and Site Allocations (adopted 2013)
- Hampshire Local Transport Plan (2011-2031)

Evidence of current or future impacts

Solent

6.4.11 The Solent Disturbance and Mitigation Project was initiated in response to concerns over the impact of disturbance on coastal designated sites and their overwintering bird assemblage. It began in 2008 and in 2009 a Phase 1 report (Literature Review and Interviews) was issued (Stillman *et al*, 2009). Phase 2 was a primary research phase, which issued reports on the results

of on-site visitor surveys (Fearnley *et al*, 2010), bird disturbance fieldwork (Liley *et al*, 2011), household surveys and future visitor modelling (Fearnley *et al*, 2011) and disturbance impact modelling (Stillman *et al*, 2012). Phase 3 outlined an avoidance and mitigation strategy to prevent adverse effects on overwintering bird populations around the Solent (Liley & Tyldesley, 2013).

6.4.12 The research showed that an estimated 52 million visits are made by households to the Solent coast each year, of which just over half are made by car. The majority of visitors make trips to the coast specifically to see the sea and enjoy the coastal scenery. Dog walking was the most frequently observed activity, with walking, cycling and jogging being other common recreational activities. Most activities involved people staying on the shore/sea wall rather than being on the intertidal areas or in the water. Human activity that took place on the intertidal areas was more likely to result in bird disturbance; on those areas dog walking was particularly common and resulted in a disproportionate amount of the observed bird disturbance.

6.4.13 The whole of Fareham Borough falls within the 5.6km zone of influence around the Solent European sites (Figure 6.6). The Fareham Local Plan sets out a minimum housing requirement of 8,389 over the plan period (2021-2037), and proposes allocation of the sites listed in Table 6.8 to contribute towards meeting the requirement. In the absence of avoidance and/or mitigation measures, this level of residential development is likely to increase the number of regular visitors to the Solent and Southampton Water SPA/Ramsar, Portsmouth Harbour SPA/Ramsar and Chichester and Langstone Harbours SPA/Ramsar. The resultant increase in disturbance from people and their dogs is likely to adversely affect overwintering populations of qualifying bird species, by reducing winter survival rates in Solent and Southampton Water, Portsmouth Harbour and Chichester and Langstone Harbours, and thereby undermining the integrity of these SPAs/Ramsars.

Table 6.8: Proposed Residential Allocations Falling within 5.6km Solent Mitigation Zone

Ref	Name	No. dwellings
FTC1	Palmerston Car Park	20
FTC2	Market Quay	100
FTC3	Fareham Station East	120
FTC4	Fareham Station West	94
FTC5	Crofton Conservatories	49
FTC6	Magistrates Court	45
HA1	North and South of Greenaway Lane, Warsash	824
HA3	Southampton Road, Titchfield Common	348
HA4	Downend Road East	350
HA7	Warsash Maritime Academy, Warsash	100
HA9	Heath Road, Locks Heath	70
HA10	Funtley Road South, Funtley	55
HA12	Moraunt Drive, Portchester	48
HA13	Hunts Pond Road, Titchfield Common	38
HA15	Beacon Bottom West	29

Ref	Name	No. dwellings
HA17	69 Botley Road, Park Gate	24
HA19	399-409 Hunts Pond Road	16
HA22	Wynton Way	13
HA23	Stubbington Lane	11
HA24	335-357 Gosport Road	8
HA26	Beacon Bottom East, Park Gate	9
HA27	Rookery Avenue	32
HA28	3-33 West Street, Portchester	16
HA29	Land East of Church Road	20
HA30	33 Lodge Road	9
HA31	Hammond Industrial Park	36 (64 bed care home)
HA32	Egmont Nurseries	8
HA33	Land East of Bye Road	7
HA34	Land South West of Sovereign Crescent	38
HA35	Former Scout Hut, Coldeast Way	7
HA36	Locks Heath District Centre	35
HA37	Former Locks Heath Filing Station	30
HA38	68 Titchfield Park Road	9
HA439	Land at 51 Greenaway Lane	5
HA40	Land West of Northfield Park	22
HA41	22-27a Stubbington Green	9
HA42	Cams Alders	60
HA43	Corner of Station Road, Porchester	16
HA44	Assheton Court	60
HA45	Land rear of 77 Burridge Road	3

6.4.14 The Phase 3 (Liley & Tyldesley, 2013) report considered the available options for avoiding and mitigating impacts to the overwintering bird assemblage of the Solent European sites, in the context of current planning policy and regulation. It outlined a strategy of projects including 'quick wins' and longer term behavioural change initiatives for reducing the overall adverse effect such that planned new developments can be accommodated. The Solent Recreation Mitigation Partnership (SRMP) was established in 2014 to implement the recommendations of the Phase 3 report. An Interim Strategy was produced in 2014, which has now been replaced by the final strategy published in December 2017[28]. The 2017 strategy proposes a series of management measures to prevent bird disturbance through recreational activities associated with new housing development planned around the Solent up to 2034. These measures include:

[28] Bird Aware Solent (December 2017): *Solent Recreation Mitigation Strategy*. Available online at: https://solent.birdaware.org/media/29372/Bird-Aware-Solent-Strategy/pdf/Solent_Recreation_Mitigation_Strategy.pdf

- a team of 5-7 coastal rangers to advise people on how to avoid bird disturbance, liaise with landowners, host school visits, etc;
- communications, marketing and education initiatives and an officer to implement them;
- initiatives to encourage responsible dog walking and an officer to implement them;
- preparation of codes of conduct for a variety of coastal activities;
- site-specific projects to better manage visitors and provide secure habitats for the birds;
- providing new/enhanced greenspaces as an alternative to visiting the coast; and
- a partnership manager to coordinate and manage all the above.

6.4.15 The strategy requires all new dwellings built within 5.6 kilometres of the boundaries of the SPAs (the 'zone of influence') to contribute towards this package of measures. In order to ensure there is a mechanism for funding these mitigation measures 'in perpetuity', beyond 2034, a proportion of the money received each year from developer contributions is transferred to an investment fund, which, by 2034 will be sufficiently large to fund the mitigation measures 'in perpetuity'. Policy NE3 of the Local Plan requires residential developments to contribute financially to the Solent Recreation Mitigation Strategy. Taking account of this mitigation strategy (but not at the screening stage), Chapter 7 undertakes an assessment of the disturbance effects of the Local Plan on the Solent and Southampton Water, Portsmouth Harbour and Chichester and Langstone Harbours SPAs/Ramsars in view of the sites' conservation objectives.

New Forest

6.4.16 Three separate surveys addressing recreational impacts to the New Forest National Park were jointly commissioned by six local planning authorities (Test Valley Borough Council, Eastleigh Borough Council, New Forest District Council, New Forest National Park Authority, Southampton City Council and Wiltshire Council), together with Natural England and Forestry England. The surveys were undertaken across the New Forest SAC/SPA/Ramsar in 2018 / 2019 and included:

- A telephone survey with residents living around the New Forest (25km radius);
- Face-face interviews and counts of people at a range of car parks and other access points across the New Forest SAC/SPA/Ramsar; and
- A series of simultaneous counts of vehicles using set parking locations across the New Forest SAC/SPA/Ramsar.

6.4.17 Based on counts made at 56 formal car park locations during the on-site survey, the authors estimate 2,007,144 visits across the year to the surveyed locations. These car parks represent 38% of formal car parks within the New Forest and on that basis the authors estimate that the overall number of person visits across the year to the SAC/SPA/Ramsar is therefore likely to be over 4 million and could be up to 5.3 million. These counts also only represent car entries to the park; there are also a number of foot entry points for which it was not possible within the scope of the study to scale up the visitor counts. An estimate of annual visitor numbers was also made using data from the vehicle counts carried out at 270 parking locations across the New Forest.

These vehicle counts suggest around 5.7 million person visits per year. Overall, the authors conclude that footfall within the New Forest SAC/SPA/Ramsar is likely to be between 5 and 6 million visitors per year, and this excludes people walking out from campsites, other holiday accommodation and the town and village centres.

6.4.18 New housing numbers considered in the Footprint Ecology study of housing change (Liley *et al.*, 2019) included all local authorities within a 25km radius of the New Forest, including Fareham Borough. This was equivalent to a level of new housing around 129,222 dwellings to 2036 an increase from existing housing levels of around 16.4%. The telephone and on-site survey data was used to model the effect of this increased housing on visitor numbers. The authors predict this would result in an increase of around 11.4% in the number of visits. However the number of visits was also shown to decline significantly with distance especially over the first few kilometres from the SAC/SPA/Ramsar. The study concluded that only 0.09% of all proposed new housing occurs within the first 3km of the surveyed access points, but these are predicted to contribute 15.06% of all the predicted extra visits from people living in the extra houses. By contrast 34.10% of all planned extra housing occurs 30-50km from the survey points, but this is predicted to contribute only 4.50% of the extra visits from the new housing.

6.4.19 The accompanying Footprint Ecology 'Impacts of recreation and potential mitigation approaches' study (Lake *et al.*, 2020) identified seven main pathways by which recreational activities may impact on the designated features of the New Forest SAC/SPA/Ramsar: disturbance, fire, contamination, trampling/wear, harvesting, grazing issues and visitor perception.

6.4.20 The New Forest Recreation Management Strategy (NFNPA, 2010) sets out a strategic direction for the management of outdoor recreation in the New Forest National Park from 2010 – 2030. The strategy extends beyond the scope of impacts of recreation on the SA/SPA/Ramsar but it is acknowledged that the strategy will help to mitigate impacts on the designated sites. Forestry England, Natural England, Hampshire County Council, New Forest District Council, Test Valley Borough Council, the Verderers and the New Forest National Park Authority have been working together on that update, which included a Future Forest consultation in 2017 and further public consultation in 2018. The Footprint Ecology study (Lake *et al.*, 2020) identifies a number of potential mitigation options which align with ongoing strategic work to update the New Forest Recreation Management Strategy, which includes a framework for implementation and delivery. The potential mitigation options include:

- Alternative recreational greenspace sites and routes outside of designated sites, including improvements to existing greenspaces and the creation of new greenspaces;
- Access management within the designated sites, including revisions to parking and improved management;
- Education and communications activities, including better information and interpretation and an increased number of rangers; and
- Other measures such as presumption against development within the designated site and the distribution of housing to minimise impact.

Fareham Local Plan

- Special Protection Area
- SPA Mitigation Buffer (5.6km)
- Spatial Planning Areas
- Borough

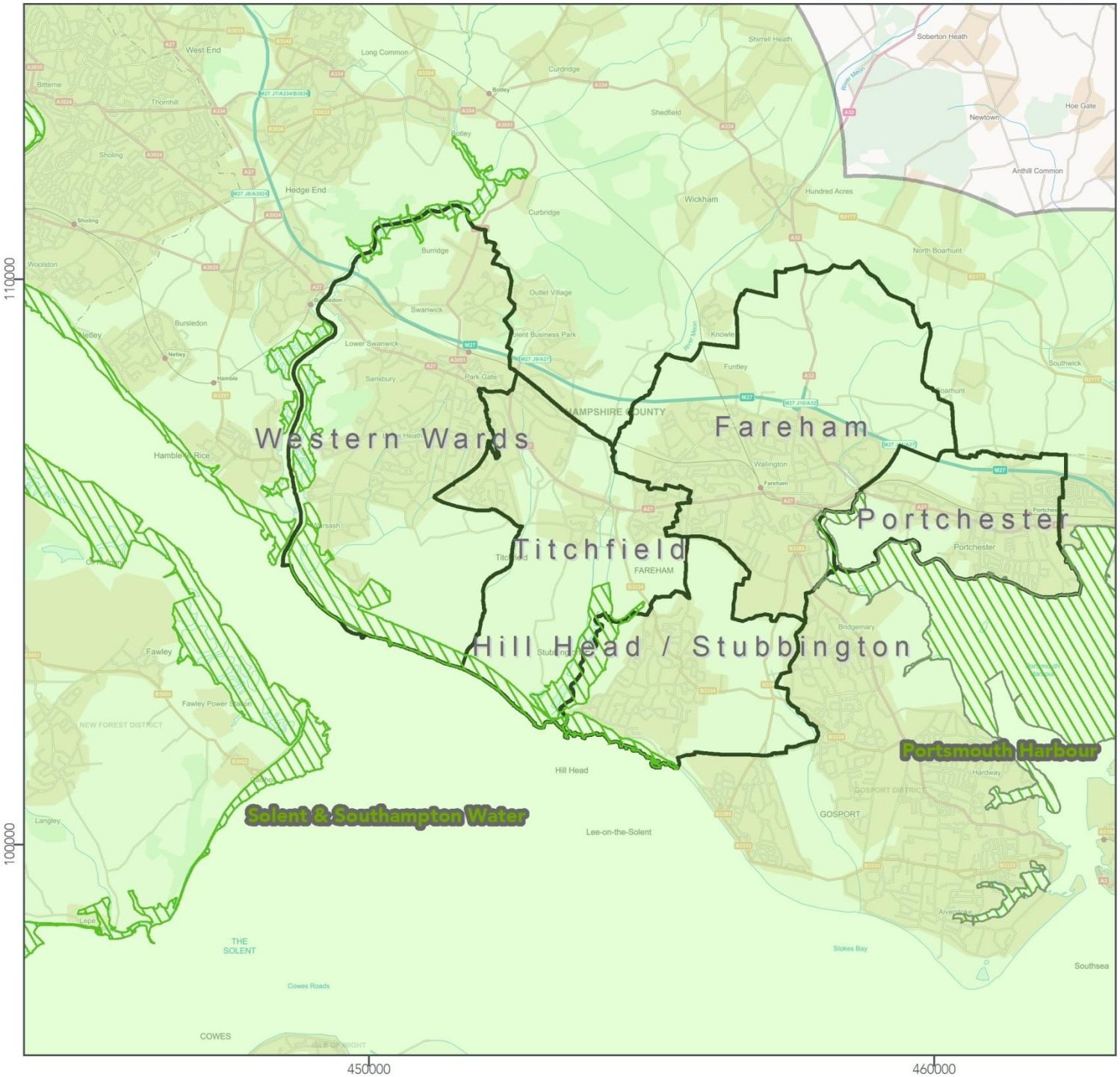

Figure 6.6: 5.6km Recreational Buffer around the Solent SPA/Ramsars

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Kilometers

N

Scale: 1:100,000 **Created by:** JC
Date: Mar 2020 **Reviewed by:** GC
Drawing number:
UE-0192_HRA_SPA_Buffers_200225

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Effects associated with the Fareham Local Plan

6.4.21 The whole of the Borough falls within the 5.6km zone of influence around the Solent SPAs as shown in Figure 6.6; therefore, it is considered that there is potential for likely significant effects as a result of strategic disturbance to the Solent designated sites, not taking mitigation measures into account. This pathway for the Solent sites is taken forward for Appropriate Assessment.

6.4.22 Whilst the Borough does fall within a 25km radius of the New Forest SAC/SPA/Ramsar (straight line distance), the most westerly sections of the Borough are located approximately 30km (travel distance) from the park boundary using the M27 motorway route. Therefore, as shown by the Footprint Ecology study, visits to the New Forest SAC/SPA/Ramsar associated with increased housing development in Fareham Borough contribute a significantly lower proportion of overall visits to the designated sites and it is not considered likely that significant effects associated with recreational disturbance from Fareham housing development would arise. This pathway for the New Forest sites is therefore screened out of Appropriate Assessment.

6.5 Water Abstraction and Supply

Impact mechanisms

6.5.1 New homes require the development of new infrastructure, including the provision of fresh water supply. Water quantity plays a critical role in the health and biodiversity of river catchments, including water levels (depth and volumetric flow) and velocity in the river, and water table levels in the floodplain. These properties in turn influence rates of siltation and erosion, dissolved oxygen, and pollutant and nutrient concentrations. Low flow rates affect food availability for riparian fauna, may limit migration and dispersal, and can alter the structure, composition and condition of vegetation communities.

6.5.2 Fareham Borough falls within the supply zones of both Portsmouth Water and Southern Water. Most Portsmouth Water abstractions are linked to river flows, either directly at the Itchen via Gaters Mill, or indirectly through groundwater abstractions affecting the Hamble, Meon, Wallington, Ems and Lavant. Portsmouth Water has a single Water Resource Zone (WRZ). Fareham Borough falls within the Southampton East Southern Water WRZ where supply is drawn from both surface (52%) and groundwater (48%) sources (Southern Water, 2019a). Surface water is drawn from abstractions at Testwood on the River Test, and Otterbourne on the Itchen. Groundwater is drawn from the Chalk aquifer. Southampton East WRZ falls within the wider Western Area.

Extent of current and future impacts

Southern Water

6.5.3 There have been concerns about the quantity of water flow in the River Itchen and resulting impacts to the SAC which supports an abundant and exceptionally species rich aquatic flora. Additional pressure for water abstraction could result in adverse effects on the ecological

integrity of the River Itchen SAC both via direct abstractions from the river and indirectly through groundwater abstractions.

6.5.4 Following publication of its Water Resources Management Plan (WRMP) 2014, Southern Water appealed against abstraction licence changes proposed by the Environment Agency. The changes were proposed in order to avoid ecological damage within the River Test and Itchen but Southern Water was concerned that the changes would limit its ability to undertake its statutory duties with respect to water supply particularly in periods of drought. A Public Inquiry took place in March 2018 and focused on a proposed operating agreement between Southern Water and the Environment Agency under Section 20 of the Water Resources Act 1991 ("the s20 agreement"). The s20 agreement was signed and presented to the Inquiry at its closure on 29 March 2018 (Southern Water, 2019b). The Southern Water 2019 WRMP, which covers the period 2020 to 2070, reflects the commitments of the s20 agreement, including the abstraction licence changes as proposed by the EA and a modified drought permit determination process and the inclusion of force majeure clauses in the proposed new River Test license.

6.5.5 At the start of the planning period, with the Environment Agency's licence changes implemented, Southern Water estimate that water available for use (WAFU) in the Western area in a 1 in 200 year drought would be 119.02Ml/d as shown in Figure 6.7 (Southern Water, 2019b).

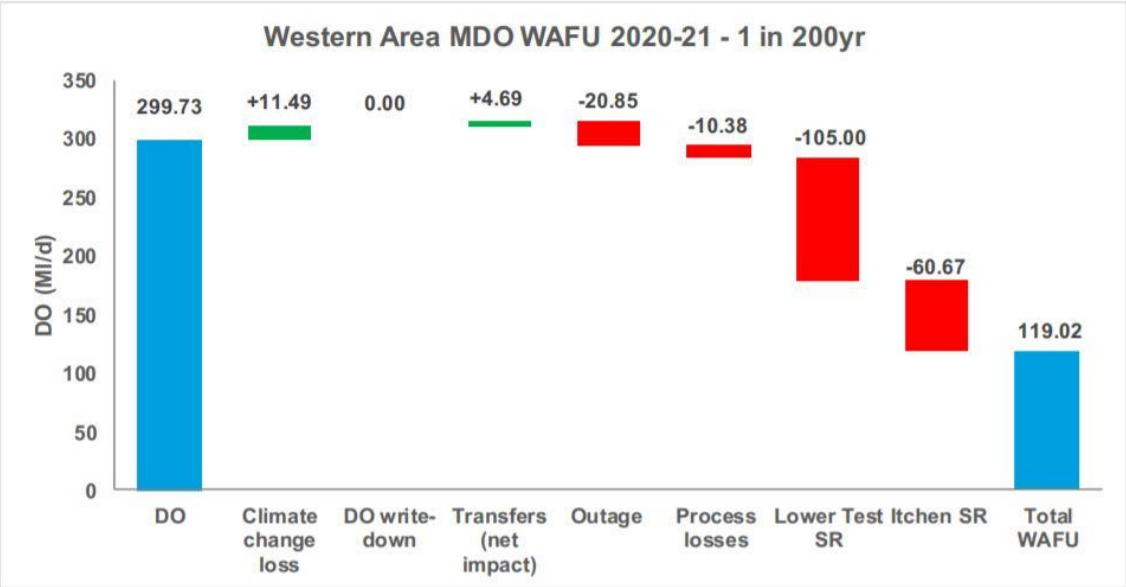

Figure 6.7: Western Area WAFU for 1 in 200 Year Drought (MDO) at Start of WRMP Planning Period (Southern Water, 2019b)

6.5.6 By the end of the planning period (2070) Southern Water estimate WAFU for the Western area as 78.12 Ml/d as shown in Figure 6.8. This accounts for anticipated further licence changes at other sources in the Western area by 2027 proposed by the Environment Agency to comply with the Water Framework Directive (Southern Water, 2019b).

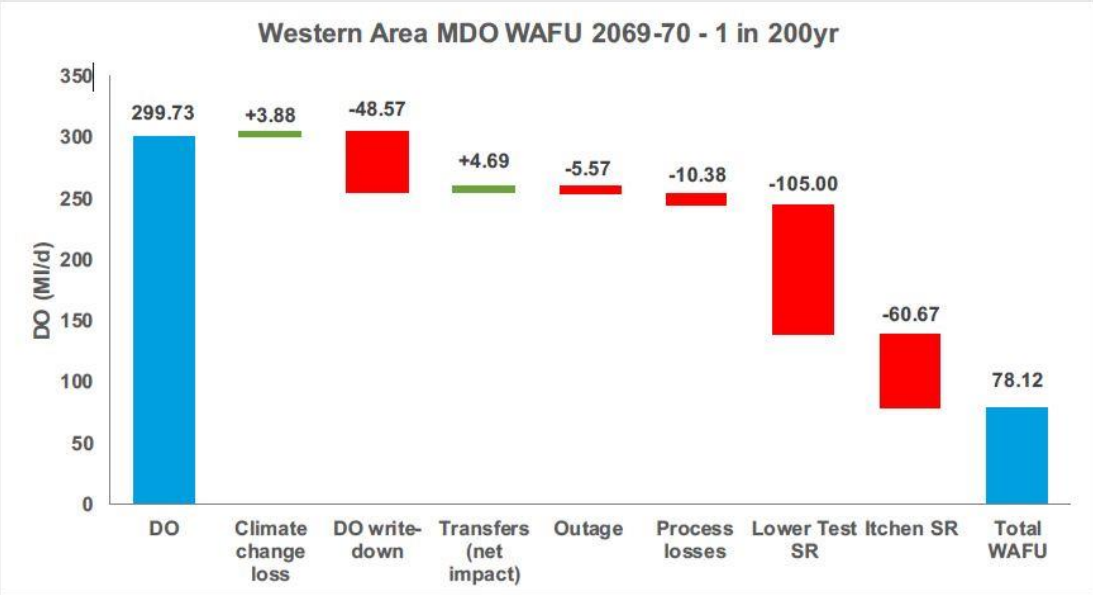

Figure 6.8: Western Area WAFU for 1 in 200 Year Drought (MDO) at End of Planning Period (Southern Water, 2019b)

6.5.7 In the Western Area, despite an expected reduction in the demand for water, there will be a significant supply demand deficit throughout the planning period during a 1 in 200 drought event as shown in Figure 6.9. The "0" line across the top of the graph represents a balance between supply and demand and where the coloured bands go below this line new demand management or resource development schemes need to be implemented to restore the supply demand balance.

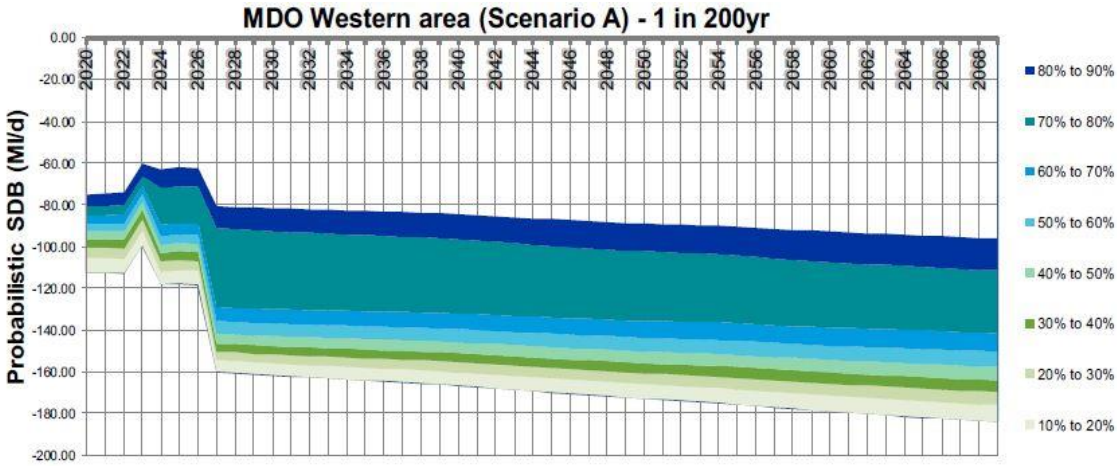

Figure 6.9: Baseline Supply-Demand Balance Distributions at the 'Severe Drought' Level (Southern Water, 2019b)

6.5.8 Southern Water has considered options to address this deficit and maintain resilient supplies for their customers, incorporating an HRA of the alternatives considered. As part of the s20 agreement an interim abstraction scheme was agreed in recognition of the potential need to rely more frequently on Drought Permits and Drought Orders until new water resources can be

developed. Southern Water committed to use "all best endeavours" to implement a long term water resources scheme, based on the preferred programme (Strategy A in the draft WRPMP) shown in Figure 6.10, to provide the necessary new water resources infrastructure to respond to the impact on supply as a result of the licence changes. The interim abstraction scheme can only be utilised for the term of the s20 agreement (until 2030), ideally with long term schemes to reduce and remove the need to use the interim abstraction scheme in place by 2027. In order to demonstrate confidence in delivering a long term scheme within this time frame, Southern Water is progressing alternative strategies (Southern Water, 2019b).

6.5.9 The Stage 1 Screening Assessment of the HRA identified four options in the preferred strategy for the Western Area with likely significant effects to one or more European sites and which required Appropriate Assessment, including Bournemouth Water Import, Additional import from Portsmouth Water (Havant Thicket reservoir development), Fawley Desalination (75Ml/d) and Southampton Link Main. In addition, likely significant effects were identified for a number of strategic alternatives which may be required if a strategic option in the preferred programme cannot be delivered following more detailed planning and further environmental assessment studies; these include Fawley desalination (modular to 100Ml/d), Test Estuary Industrial Reuse, and the two Itchen indirect water reuse schemes. These were also subject to Appropriate Assessment.

6.5.10 The Appropriate Assessment concluded that none of these options would, individually, lead to any adverse effects on the integrity of a European site taking account of the proposed mitigation measures (which are not available for publication). It was also concluded that no significant in-combination effects are likely due to the implementation of multiple options concurrently.

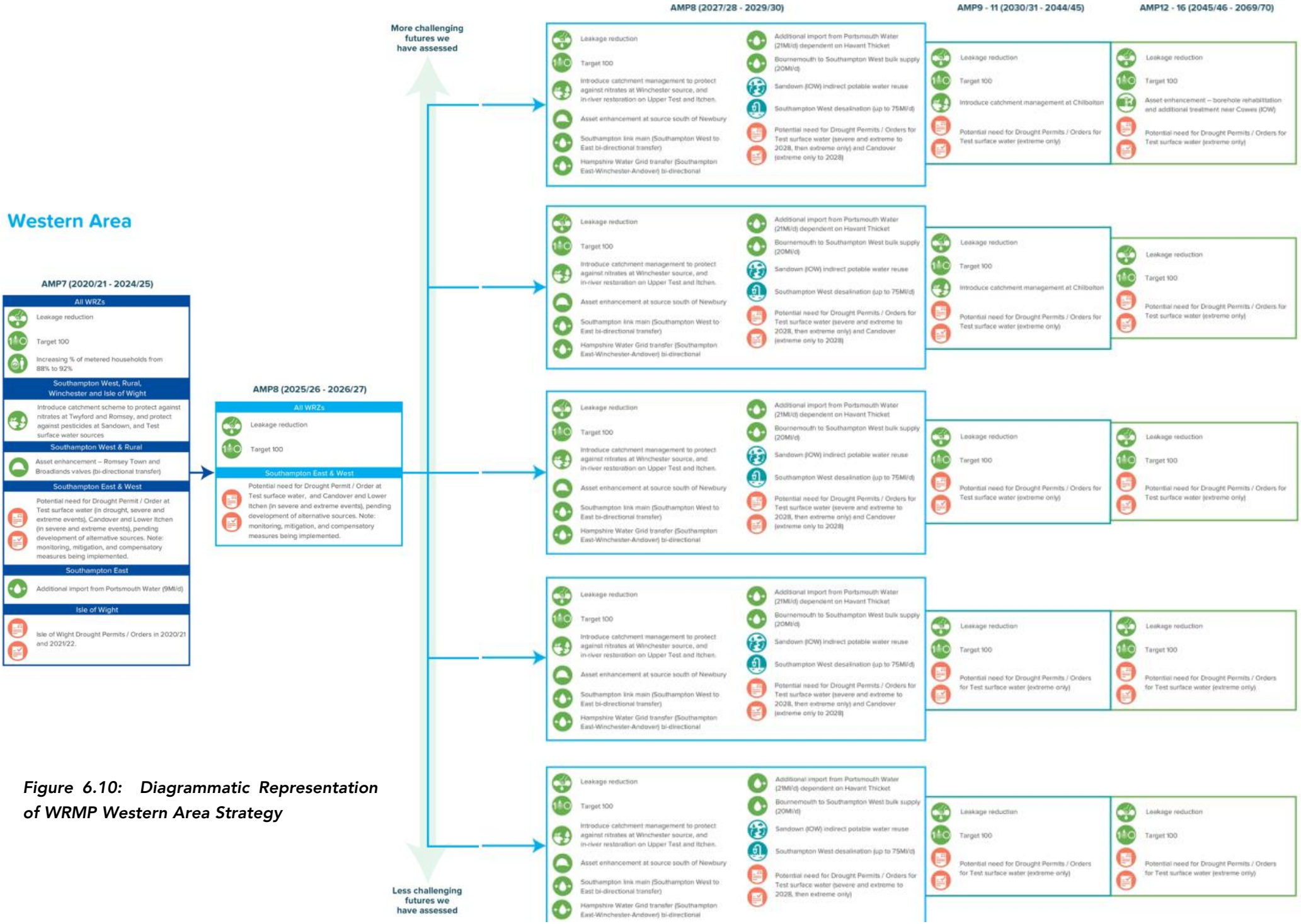

Figure 6.10: Diagrammatic Representation of WRMP Western Area Strategy

Portsmouth Water

6.5.11 Portsmouth Water published its latest WRMP in November 2019 covering the period 2020/21 to 2044/45 (Portsmouth Water, 2019). Figure 6.11 shows the supply demand deficit for the Portsmouth Water WRZ throughout the planning period during a 1 in 200 drought event under annual average conditions and Figure 6.12 shows the same under critical conditions. The red line represents demand plus target headroom and the blue line represents total WAFU. In both sets of conditions, the deficit increases with time with the impact of climate change and as the volume of bulk supplies increase. The deficit is calculated to be 33.3 Ml/d in 2019/20 increasing to 83.6 Ml/d by 2044/45 under the annual average scenario, and 34.8 Ml/d in 2019/20 increasing to 85.8 Ml/d by 2044/45 under the critical period scenario.

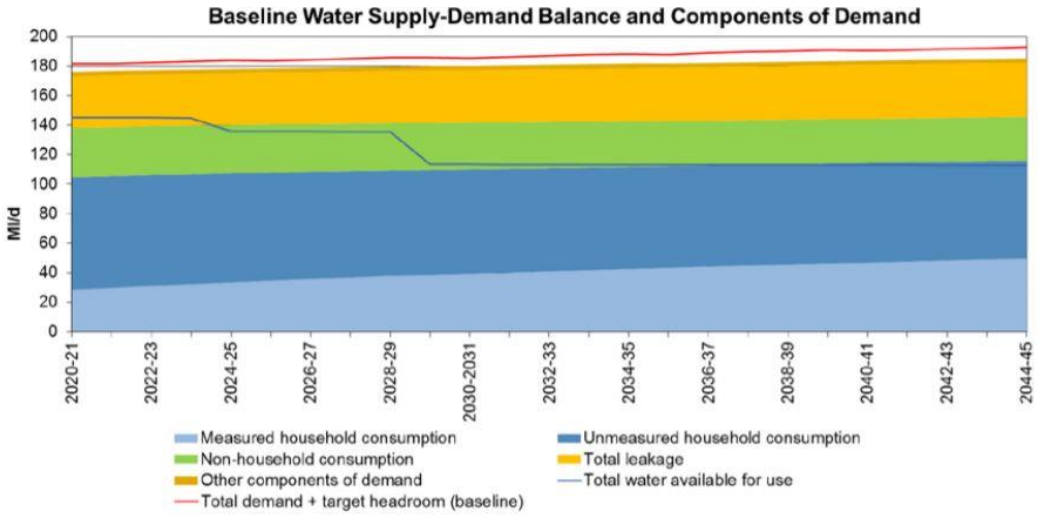

Figure 6.11: Baseline Supply Demand Graph - Design Drought Annual Average (1 in 200 Year Period) (Source: Portsmouth Water, 2019)

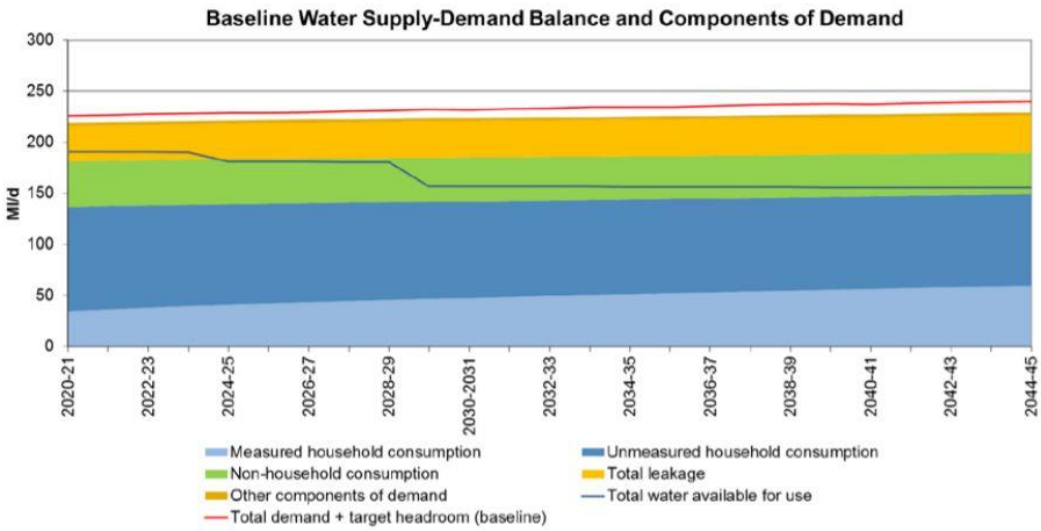

Figure 6.12: Baseline Supply Demand Graph - Design Drought Critical Period (Source: Portsmouth Water, 2019)

6.5.12 Portsmouth Water has developed options to balance supply and demand. The options within Portsmouth Water's preferred final plan and their planned start dates are set out in Table 6.9.

Table 6.9: Portsmouth Water Preferred Options to Address Supply-Demand Deficit (Source: Portsmouth Water, 2019)

Option code	Option name	AMP7 (2020/21-2024/25)	AMP8 (2025/26-2029/30)
CO46	Household water efficiency programme (partnering approach, home visit)	2020–21	
CO46b	Waterwise programme	2020–21	
CO26	Subsidy to customers that purchase water efficient appliances (washing machines and dishwashers, showers and WCs)	2020–21	
RO21a	Source O – Maximising DO	2020–21	
RO23a	Source H – Maximising DO	2020–21	
CO34	Water saving devices – Retrofitting existing toilets	2020–21	
CO06a	Metering on change of occupancy – existing meter pits	2020–21	
DO04a	Fixed network of permanent noise loggers connected to telemetry - Tranche 1	2020–21	
RO24a	Source C – Maximising DO	2020–21	
CO84	Voids metering	2020–21	
CO40	Water saving devices – spray taps	2020–21	
CO43	Water saving devices – trigger nozzles for hoses	2020–21	
CO05	Smart Meter MNFR Trial	2020–21	
CO78	Voluntary restraint and leakage action	2020–21	
CO79	Mandatory restraint	2020–21	
CO80	Imposition of Drought Direction Restrictions (mandatory commercial restraint)	2020–21	
RO68	Source S – Drought Permit	2020–21	
RO22a	Source J – Maximising DO	2024–25	
DO04b	Fixed network of permanent noise loggers connected to telemetry - Tranche 2		2025–26
CO06	Metering on Change of Occupancy - all properties		2025–26
RO13	Havant Thicket Winter Storage Reservoir		2029–30

6.5.13 Implementation of the preferred plan results in a small but increasing surplus in resource over the planning period under the annual average scenario (Figure 6.13) and a greater surplus under the critical period scenario (Figure 6.14) (Portsmouth Water, 2019).

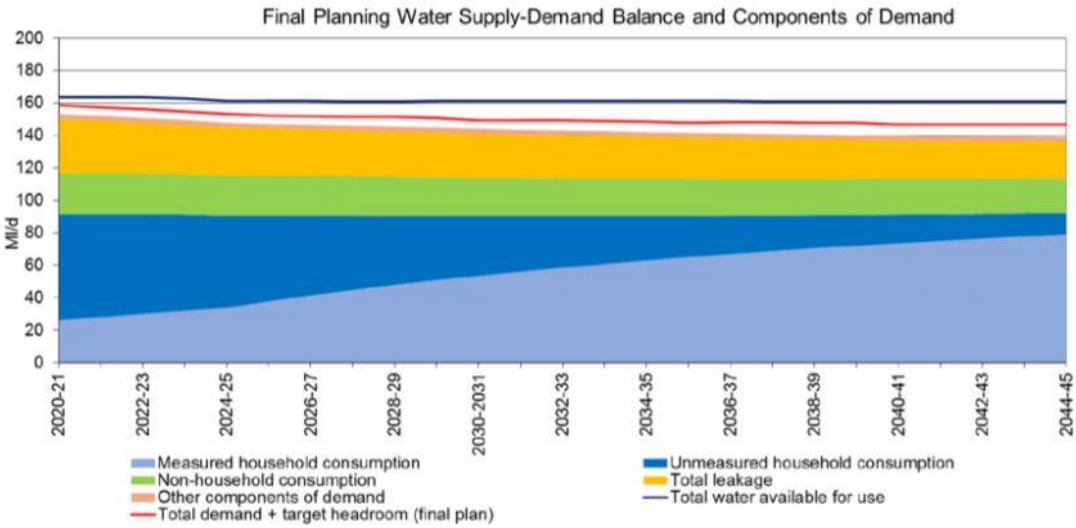

Figure 6.13: Final Planning Supply-Demand Balance Graph - Annual Average (Source: Portsmouth Water, 2019)

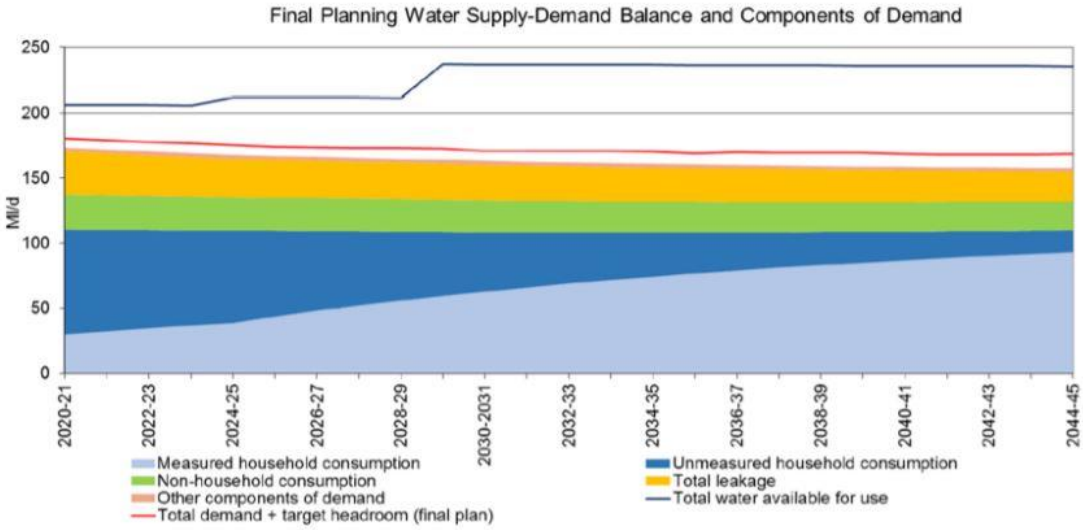

Figure 6.14: Final Planning Supply-Demand Balance Graph - Critical Period (Source: Portsmouth Water, 2019)

6.5.14 The HRA Screening of the WRMP concluded that demand reduction and leakage options will have no negative operational effects on European sites as they will reduce treated water use. Negative effects could only result through any construction works required which could not be meaningfully assessed at the strategic level since information on the location of leaks is not available without specific investigations. Therefore the options were screened in as an impact pathway is conceivable but as meaningful Appropriate Assessment was not possible for the WRMP HRA, the assessment is deferred to project level.

6.5.15 The HRA Screening identified likely significant effects to Solent Maritime SAC, Chichester and Langstone Harbours SPA / Ramsar, Portsmouth Harbour SPA / Ramsar and Solent and Southampton Water SPA / Ramsar as a result of Option R013: Havant Thicket reservoir

development, Option R021a: Funtington DO Recovery, R022a: Worlds End Group - Maximising DO and Option R023a: West Street DO Recovery. However, taking account of mitigation, the Appropriate Assessment concluded that there will be no significant changes to these sites associated with the options alone or in-combination. These mitigation measures include:

- Site and feature specific mitigation measures which must be employed at the project-level unless scheme-specific HRAs or environmental studies demonstrate that they are not required or that alternative or additional measures are more appropriate set out in Appendix G of the HRA (WRMP Appendix O). Such measures could include designing to avoid habitat features, seasonal / daily timing constraints on working, ecologically sensitive lighting, storage of materials away from commuting routes and foraging areas and excavations to be installed with ramps or battered ends to prevent species becoming trapped.
- Abstraction restrictions to the Bedhampton and Havant Springs feeding Langstone Harbour (p.31 of WRMP Appendix O); and
- Monitoring measures to avoid / give early warning of an emergency drawdown of the reservoir (p.33 of WRMP Appendix O).

Effects associated with the Fareham Local Plan

6.5.16 Southern Water and Portsmouth Water have forecast 'baseline' demand and supply across their supply networks for the periods 2020 to 2070 and 2020/21 to 2044/45 respectively in their 2019 WRMPs (Southern Water, 2019b; Portsmouth Water, 2019). These planning periods coincide with that covered by the Fareham Local Plan. This baseline demand includes 'Household demand' incorporating population growth and changes in household composition. Southern Water's forecasts are based on housing projections by Local Authorities, including Fareham Borough Council, taken from the Annual Monitoring Report 2015/16. Therefore on the basis that the increases in residential dwellings projected in the Local Plan have been accounted for in the two WRMPs it can be concluded that no likely significant effects to European designated sites are anticipated either alone or in-combination subject to the mitigation measures set out in both WRMPs being implemented. This does not remove the need for project-level HRA for the water supply projects, which will be required to address those aspects and uncertainties that can be fully assessed at plan-level, including in-combination effects with forthcoming plans and projects.

6.6 Water Pollution

Impact mechanisms

6.6.1 Fareham Borough is served by Southern Water's Peel Common Waste Water Treatment Works (WWTW). This section draws upon the PfSH Integrated Water Management Study (IWMS; Amec Foster Wheeler, 2018) in understanding WWTW capacity constraints, the ability of receiving waters to accept additional discharges without adverse effects and the nature of required changes to discharge permits or treatment infrastructure.

6.6.2 The IWMS collates data on projected growth in the number of households resulting from the Draft Fareham Local Plan and other Local Plans in the south Hampshire area, together with estimates of river flow, river quality, and WWTW effluent flow and quality. For river and effluent quality the main focus was on phosphate, ammonia, Biological Oxygen Demand (BOD, a proxy for Dissolved Oxygen in rivers) and nitrate. It should be noted that since publication of the IWMS the housing requirement in Fareham Borough has increased and work is ongoing to update the IWMS.

Phosphate

6.6.3 Phosphate can be organic (critical in DNA/RNA and energy production) and inorganic (in minerals). Phosphate contributes to the eutrophication of receiving waters, and it is acknowledged that phosphate is more generally the problem nutrient for freshwaters. Hence additional inputs of phosphate are a principal concern in relation to the River Itchen SAC where excess phosphate may result in overgrowth by epiphytic filamentous algae that compete directly with vascular plants for light and nutrients, possibly leading to loss of nutrient-sensitive species, and reduced species composition, extent and condition of riverine plant communities. However, as Peel Common WWTW outflows to the Solent, the River Itchen SAC is not at risk of significant effects from phosphate due to residential development in Fareham.

Nitrate

6.6.4 Ammonia is a form of nitrogen which aquatic plants can absorb into proteins, amino acids and other molecules. Nitrate is the stable end product of complete nitrification (which involves the conversion of ammonia into nitrite and ultimately nitrate). Both nitrate and phosphate can contribute to the eutrophication of receiving waters, but in saline coastal waters it is acknowledged that nitrate is more generally the problem nutrient, phosphate having a lesser role. Nutrient enrichment and in particular nitrogen (N) pollution arising from wastewater discharges has been implicated in the development of dense macroalgal mats occurring in the intertidal zone, which increases biological oxygen demand (BOD) and reduces dissolved oxygen content. This in turn reduces the diversity and abundance of intertidal invertebrates (wader prey) and the productivity of sea-grass beds (Brent goose forage). The major sources of nitrogen to the Solent European marine sites are from:

- Coastal background seawater from the English Channel;
- Direct rivers and streams discharging into the sites;
- Indirect rivers and streams discharging elsewhere in the Solent; and
- Effluent discharges permitted by the EA.

6.6.5 The 23 WWTWs serving south Hampshire discharge into 15 Water Framework Directive (WFD) waterbodies. Of these, the Environment Agency has assessed 13 waterbodies as having less than Good ecological status in its 2015 South East River Basin Management Plan (RBMP; Environment Agency, 2016). The main elements found to be at less than Good were phosphate, dissolved inorganic nitrogen, fish, macrophytes and phytobenthos. Figure 6.15 lists the WWTW serving Fareham Borough, together with the ecological status of receiving waters.

Figure 6.15: WFD classifications for river, transitional and coastal water bodies (2015 Cycle) (Source: Amex Foster Wheeler. 2018): Fareham Borough

WWTW	Receiving watercourse	WFD catchment	WFD waterbody	Waterbody status	Reason
Peel Common	The Solent	Solent	Solent	Moderate	Angiosperms; dissolved inorganic nitrogen; mitigation measures assessment

Other plans and projects acting in combination

6.6.6 The following plans/projects identified at the screening stage may also contribute to increasing waste water discharges to the Solent:

- Strategic development at Boorley Green, Eastleigh Borough
- Strategic development at West of Waterlooville, Havant Borough
- Strategic development at Tipner and Horsea Island, Portsmouth
- Strategic development at North of Whiteley, Winchester district
- Eastleigh Borough Adopted Local Plan Review 2001-2011 (adopted 2006)
- Eastleigh Borough Draft Local Plan 2011-2036
- Fareham Borough Welborne Plan (adopted 2015)
- Gosport Borough Local Plan 2011 to 2029 (adopted 2015)
- The Portsmouth Plan (adopted 2012)
- Portsmouth City Draft Local Plan 2014-2034
- Winchester District Local Plan Part 1 - Joint Core Strategy (adopted 2013)
- Winchester District Local Plan Part 2 – Development Management and Site Allocations (adopted 2013)

Evidence of current or future impacts

Saline habitats: Solent European Sites

6.6.7 The Solent was assessed as of Moderate ecological status in the RBMP. Natural England's supplementary advice[29] for Solent Maritime SAC makes specific mention of water quality in relation to the following features and attributes, which could have knock-on effects for wintering bird assemblages within the Solent and Southampton Water SPA/Ramsar:

- Supporting processes (water quality – contaminants): Intertidal and subtidal habitats: High levels of the priority hazardous substance tributyl tin and its compounds are present in the Southampton Water Water Framework Directive waterbody. There is no evidence

[29] Natural England: Designated Sites View: Solent Maritime SAC supplementary advice [accessed online 29/8/19]: https://designatedsites.naturalengland.org.uk/Marine/SupAdvice.aspx?SiteCode=UK0030059&SiteName=solent&SiteNameDisplay=Solent+Maritime+SAC&countyCode=&responsiblePerson=&SeaArea=&IFCAArea=

available for aqueous contaminant levels in the Western Yar, Lymington or Newtown River estuaries. The target is to reduce aqueous contaminants to levels equating to High / Good WFD Status, avoiding deterioration from existing levels.

- Supporting processes (water quality –nutrients): Intertidal and subtidal habitats: The site has been assessed as at risk of eutrophication, leading to opportunistic macroalgae and phytoplankton blooms which can smother the sediment, preventing aeration and causing anoxia (lack of oxygen). This can impact sensitive fish, epifauna and infauna communities. The target is to restore water quality to mean winter dissolved inorganic nitrogen levels.
- Supporting processes (water quality): Saltmarsh, dunes and vegetated shingle: Poor water quality and inadequate quantities of water can adversely affect the structure and function of these habitat types. Water quality should be restored to mean winter dissolved inorganic nitrogen levels at which biological indicators of eutrophication do not affect the integrity of the site and its features.
- Supporting processes (water quantity/quality): Desmoulin's whorl snail: can be vulnerable to the effects of poor water quality. Elevated levels of nitrates and phosphates could change the vegetation community on which the snail relies.

6.6.8 All WWTWs are permitted to discharge a set volume of treated effluent based on the population size they serve. This is generally referred to as the Dry Weather Flow (DWF), which is the base flow going to a WWTW of raw sewage with a small amount of groundwater infiltration and with no surface water drainage inputs. The DWF is used to help determine the quality of effluent required to protect the water environment and can also be used as an indicator of when a WWTW is reaching its volumetric design capacity and requires an upgrade. An initial assessment of the current volumes of treated effluent discharged by the main WWTW (Amec Foster Wheeler, 2018) indicated that five were already discharging volumes in excess of the permits and a further three had less than 10% spare capacity; these were mostly located on the Isle of Wight but also include Peel Common WWTW which serves Fareham Borough.

6.6.9 The IWMS used projected future housing numbers to calculate increases in effluent discharges based on assumed occupancy rates for the new housing, added to the current volume of treated effluent discharged from the relevant WWTW. The occupancy rates and flow estimates were based on a worst case scenario. The impact of this increase in treated sewage effluent on the receiving watercourses and coastal waters was then modelled and the results assessed against the current condition of the receiving waters. Where a potentially significant deterioration was identified, indicative permit standards were calculated to prevent the deterioration[30].

South Hampshire assessment

6.6.10 This assessment of impacts on water quality, WWTW and sewer capacity considered 20 WWTW and their associated sewer networks. The IWMS reported that some are likely to need upgrading by 2020 in order to ensure that future housing growth in the PfSH area will not have a

[30] N.B. An exceedance of a flow permit is not in itself an issue as the sewerage undertaker could apply to the Environment Agency for a new flow permit. This may be permitted where it is matched by an equivalent improvement in the quality of the water being discharged, thus protecting the receiving waters (i.e. overall there would be load standstill to the receiving waters).

detrimental impact on water quality. In addition, there are currently gaps in the evidence base that require further investigation, monitoring and potentially action, to ensure future growth is compliant with the Habitats and Water Framework Directives. This includes the potential for cumulative impacts within WFD catchments receiving discharges from more than one WWTW, such as Southampton Water and Portsmouth Harbour.

6.6.11 Four WWTW will require improvements to reduce ammonia, and eleven to reduce phosphate. Although no WWTW were identified as requiring improvements to reduce nitrate (N) loading from their discharges due to direct impacts from future house growth, it should be noted that at least four WWTW will require standstill for N once their existing permitted flow limit is reached. Permitted flow limits will also need to be reviewed for another six WWTW in 2022, to assess if standstill for N is required at these locations. In addition following the assessment of potential cumulative impacts including diffuse sources, the IWMS identifies where catchment measures to reduce diffuse pollution should be implemented in order to ensure the water body and designated area can achieve their objectives based on the current condition of the area irrespective of housing growth; these include Southampton Water and Portsmouth Harbour.

Fareham Borough assessment

6.6.12 The growth areas in Fareham will drain to the Peel Common WWTW. Although overall no significant impact or deterioration is predicted due to future housing growth, the Peel Common WWTW may require improvements by 2025 to increase capacity in the WWTW, which will be subject to review in 2022. Sewer capacity upgrades are also likely to be required at this WWTW. The catchment has nitrate problems and catchment level nitrate measures are required now (section 6.6.14).

6.6.13 Overall, increased housing resulting from the Plan is likely to increase pressure on Peel Common WWTW, which drains into the Solent. There is uncertainty as to whether new housing development in the PfSH region can be accommodated without having a detrimental effect on the water environment.

Figure 6.16: Summary of growth pressures on WWTW serving Fareham Borough (Source: Amec Foster Wheeler, 2018)

WWTW	Measured flow 2013-15 (m3/day)	Consented flow (m3/day)	DWF exceedance predicted	Mitigation for N	Sewer capacity required	Freshwater mitigation required
Peel Common	55,180	59,683	Reaches capacity in 2025 (currently <10%)	Review in 2022	Yes	n/a

Nutrient neutrality

6.6.14 Condition assessments undertaken by Natural England in 2018 and 2019 identified some interest features of the Solent designated sites to be in unfavourable condition. For the Solent Maritime SAC, qualifying features including estuaries, subtidal sandbanks, and intertidal mudflats and sandflats were found to be in unfavourable condition based on a number of attributes failing, including nutrient water quality. The site condition assessment did not include

saltmarsh, however preliminary analysis shows a reduction in extent of saltmarsh across the Solent between 2008 and 2016 and elevated nutrient can contribute towards the susceptibility of saltmarsh to erosion through effects on plant root growth and the cohesion of mud around the roots. Condition assessments for the Solent SPAs and Ramsar sites have yet to be undertaken, but a number of bird features are declining as highlighted by recent Wetland Bird Survey alerts (Chapter 4) (Natural England, 2020a).

6.6.15 In light of the ongoing uncertainty in relation to the ability of the PUSH region to accommodate future housing growth without having a further detrimental effect upon the water environment, Natural England's current advice is that all new development resulting in any net increase in dwellings or overnight accommodation uses should achieve nutrient neutrality. By ensuring that new development does not add to existing nutrient burdens this provides certainty that the project / plan is deliverable in line with the Habitats Regulations. This position takes into account recent case law including the CJEU judgements on People over Wind and the case known as the Dutch case[31].

Nitrogen budget

6.6.16 To address Natural England's latest advice, FBC has calculated a nitrogen budget for the Fareham Local Plan using the Natural England methodology published in June 2020. The nitrogen budget measures Total Nitrogen (TN) which includes both organic and inorganic forms of nitrogen, as this is what is available for plant growth. The results indicate that the total nitrogen budget for the Fareham Local Plan is 2,536.99 kg/TN/year. A positive figure indicates a surplus of nitrogen resulting from the development proposed in the plan and therefore mitigation will be required to achieve nutrient neutrality and avoid any impact to internationally designated sites in the Solent. Appendix III includes a breakdown of this budget by each housing allocation. Those allocations which make the most significant contributions to the overall nitrogen surplus include HA1 Land North and South of Greenaway Lane and HA3 Southampton Road given the large volume of development set to come forward on these sites (824 and 348 dwellings respectively). Windfall development also makes a significant contribution to the overall nitrogen surplus, almost 50%. Key assumptions made by the Council in the calculation of the nitrogen budget for windfall sites are also set out in Appendix III.

6.6.17 Overall, on account of the nitrogen surplus associated with development in the Fareham Publication Plan, it is considered that there is potential for likely significant effects to the Solent European designated sites and this pathway is taken forward for Appropriate Assessment.

6.7 Site-specific Impacts

6.7.1 Site-specific impacts are those which emanate from the development of a given site and operate at a local scale on nearby European sites, potentially resulting in the actual or functional loss of habitats which have a role in supporting the integrity of the European sites. Impacts can be further separated into impacts during the construction or operational phase, and are defined in the following sections:

[31] Joined Cases C-293/17 and C-294/17, CJEU (2018): *Coöperatie Mobilisation for the Environment UA and Others v College van gedeputeerde staten van Limburg and Others.*

Construction impacts

- Habitat loss due to the location/footprint of development;
- Construction noise;
- Construction activity; and
- Aquatic pollution during remediation, demolition or construction.

Operation impacts

- Disturbance due to increased activity (including the impacts of recreation which are not addressed by the SRMP); and
- Displacement due to shortened sight lines.

Habitat loss during construction

6.7.2 This pathway is defined as impacts from development which, due to its location and size (i.e. footprint), changes the extent or distribution of a qualifying habitat or the habitats of qualifying species within a European site, thereby reducing the population or restricting the distribution of qualifying species.

6.7.3 It also includes development which would result in the loss of habitats which support the ecological functions of a European site, such as those classified as being Core areas, Primary or Secondary support areas and Low Use sites for waders or dark-bellied Brent goose in the *Solent Waders and Brent Goose Strategy* (Whitfield, 2019). There are three Core areas with Fareham Borough, located along the Hamble estuary and Solent foreshore in the south-west of the Borough as well as five Primary support areas, 11 Secondary support areas and 85 Low Use sites; see Figure 6.17 and Figure 6.18.

Construction noise

6.7.4 This pathway is defined as impacts from development whose construction processes emit a level of noise which could change the distribution of qualifying species within a European site or important supporting area, displacing the species from otherwise suitable habitats, and thereby reducing individual survival rates and risking a population reduction. This could be due to the proximity of the development site to the European site / supporting area, or the absence of existing topographic features, structures or vegetation which may serve to sufficiently attenuate the noise, or a combination of both.

Fareham Local Plan

- Candidate
- Core Area
- Low Use
- Primary Support Area
- SPA site
- Secondary Support Area
- Spatial Planning Areas
- Borough

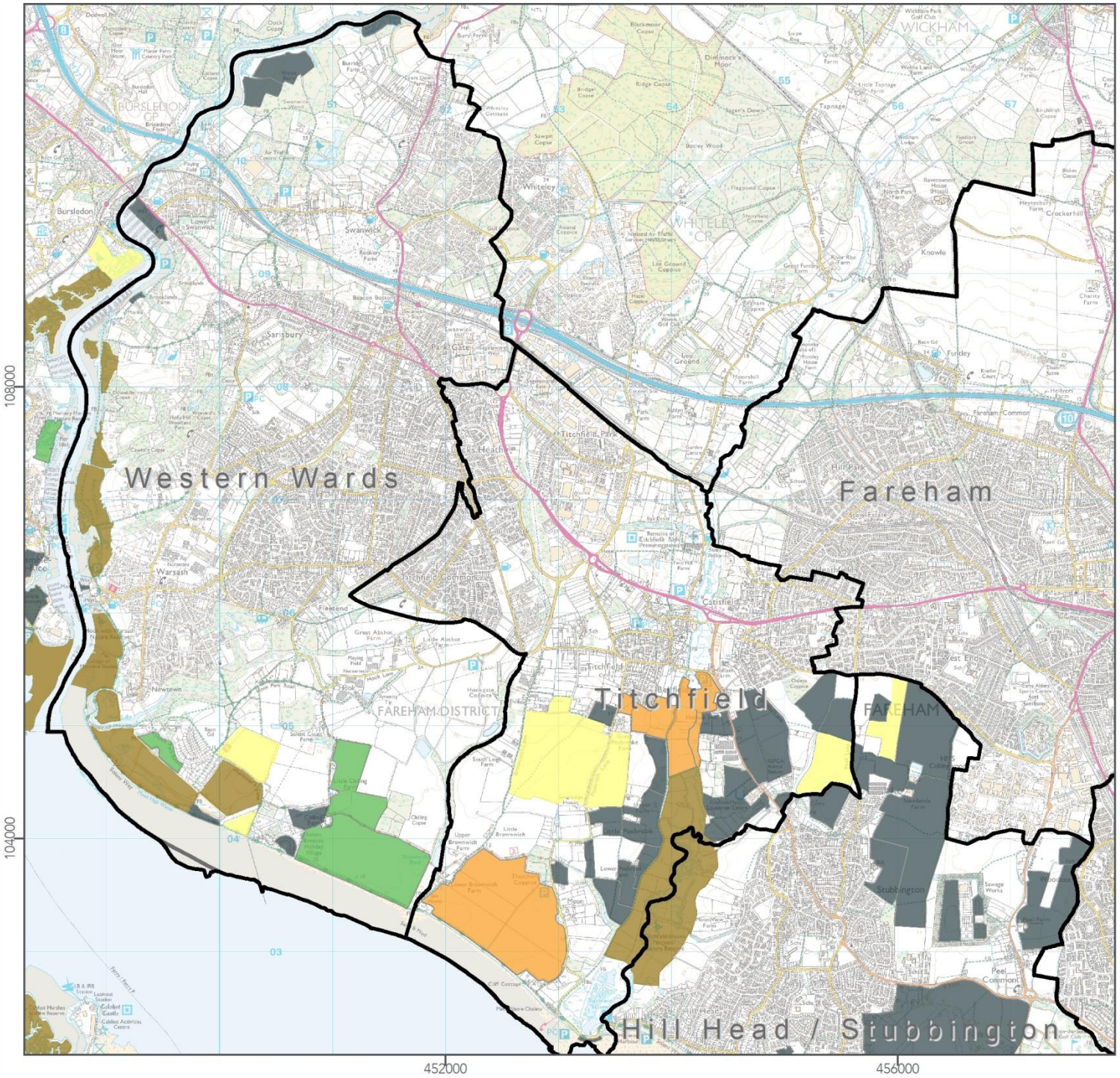

Figure 6.17: Brent goose and waders (west)

0 1 2
Kilometers

N

Scale: 1:50,000 **Created by:** JC
Date: Jul 2020 **Reviewed by:** GC
Drawing number:
UE-0192_Brent_Goose_&_Wader_200721_West

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Fareham Local Plan

- Candidate
- Core Area
- Low Use
- Primary Support Area
- SPA site
- Secondary Support Area
- Spatial Planning Areas
- Borough

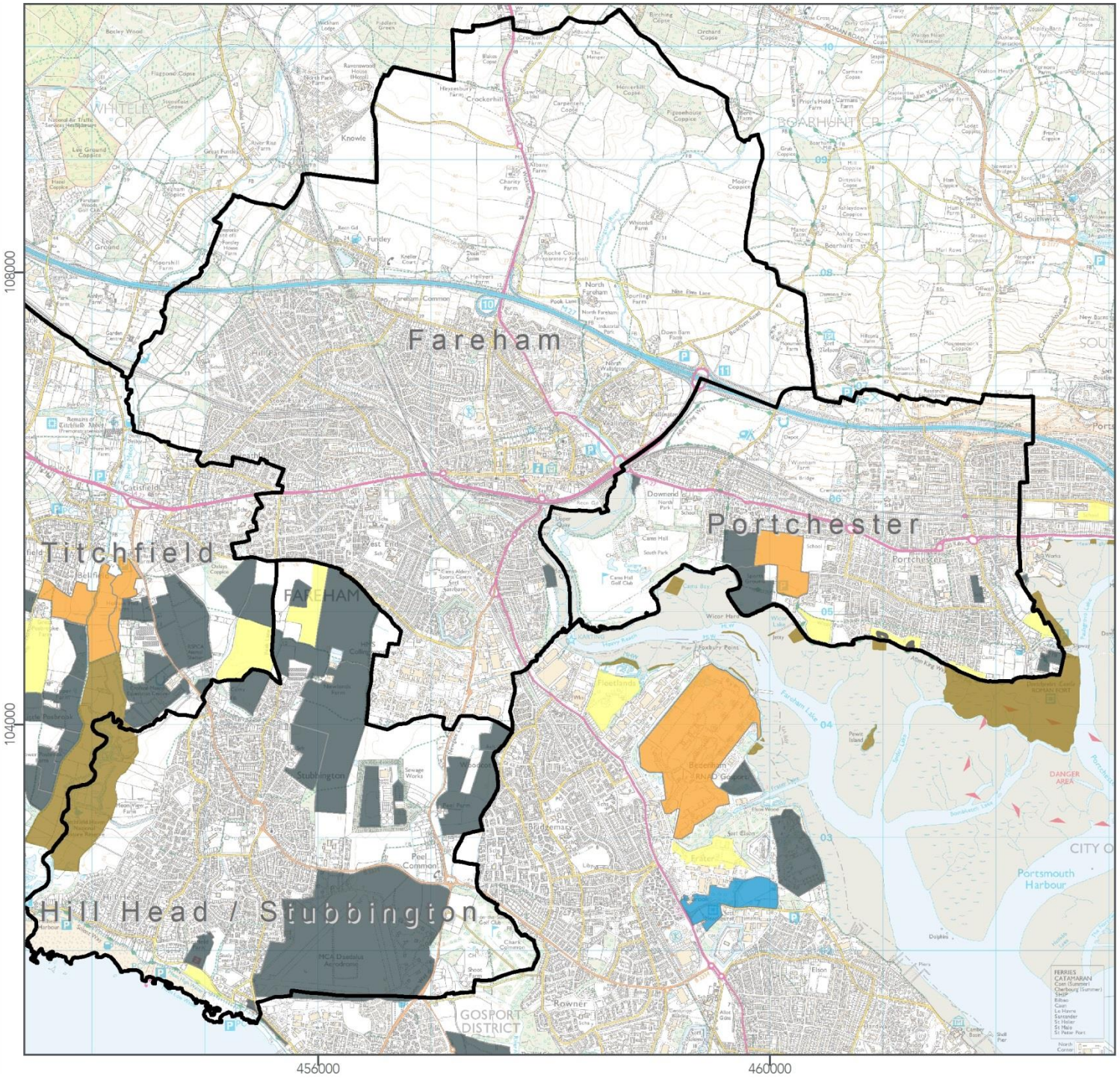

Figure 6.18: Brent goose and waders (east)

0 1 2
Kilometers

N

Scale: 1:50,000 **Created by:** JC
Date: Jul 2020 **Reviewed by:** GC
Drawing number:
UE-0192_Brent_Goose_&_Wader_200721_East

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Web: www.ueec.co.uk

6.7.5 Very loud (defined as greater than 70dB) and percussive noises have the potential to disturb birds, increasing time spent alert and in flight, and reducing the time available to feed. Peak levels of sound are most likely to occur from the impact of pneumatic drilling and concrete breaking during site preparation and piling during construction. These activities can have an impact on bird species at a distance of up to 300m. This figure has been used as a worst-case scenario and is based on published research and studies by the Environment Agency for the Humber Estuary Tidal Defences scheme, the Environmental Statement for which states that: "*Sudden noise in the region of 80dB appears to elicit a flight response in waders to 250m from the source, with levels below this to approximately 70dB causing flight or anxiety behaviour in some species.*'' (Environmental Statement for the Humber Estuary Tidal Defences: Urgent works, Paull to Kilnsea and Whitton to Pyewipe, cited in Biodiversity by Design, 2008, p.79).

Construction activity

6.7.6 This pathway is defined as impacts from development whose construction processes involve a heightened level of activity which could change the distribution of qualifying species within a European site or important supporting area, displacing the species from otherwise suitable habitats, and thereby reducing individual survival rates and risking a population reduction. This could be due to the proximity of the allocation site to the European site / supporting area, or the absence of existing topographic features, structures or vegetation which may serve to sufficiently screen the activity, or a combination of both.

6.7.7 Stillman *et al* (2012; Table 6.1, p.61) identify median distances for Brent goose and some waders within which the birds commonly respond to human activity, thereby causing changes in behaviour or displacement from otherwise suitable habitats. This response distance, which is around 80-100m for most species analysed in the Solent area, provides some context for sites which are particularly close to a European site or Core, Primary or Secondary Support areas for Brent goose.

Aquatic pollution during construction

6.7.8 This pathway is defined as impacts from development of a site which is thought to contain contaminants whose mobilisation during remediation, demolition or construction could result in pollution of a qualifying habitat or habitat of a qualifying species, thereby limiting the function of the habitat or altering the supporting processes on which it relies.

6.7.9 This could occur by causing the pollutants to be released into an aquatic environment that is hydrologically connected with the habitat. Pollution impacts could also occur as a result of a pollution incident during construction on a site which is hydrologically connected with a qualifying habitat or habitat of a qualifying species (regardless of whether the allocation site is thought to be contaminated).

Disturbance due to increased operational activity

6.7.10 This pathway is defined as impacts from development (of any type) which results in heightened activity or increased operational noise within the development site, thereby causing changes in the distribution of qualifying species within a European site or important supporting area,

displacing the species from otherwise suitable habitats, and thereby reducing individual survival rates and risking a population reduction. This could be due to the proximity of the allocation site to the European site / supporting area and/or the absence of existing topographic features, structures or vegetation which may serve to sufficiently screen the activity or attenuate the noise. The response distance of around 80-100m referred to above provides some context for sites which are particularly close to a European site or Core, Primary or Secondary Support areas for Brent goose.

Displacement during operation due to shortened sight-lines

6.7.11 This pathway is defined as impacts from development (of any type) which changes the distribution of a qualifying species within a European site or important supporting area by reducing sight lines available to birds using the habitats within the site.

6.7.12 Several bird species can be displaced as a result of their specific line-of-sight requirements while foraging or roosting, whereby obstruction to sight lines (necessary for early warning of perceived predation risk) will render areas of habitat unsuitable for use by birds. For example, terns and gulls prefer open nest sites and unrestricted views while roosting and feeding. Waders, including ringed plover, black-tailed and bar-tailed godwits, redshank, curlew, turnstone, dunlin and sanderling, require views of greater than 200m when roosting or feeding. Brent goose requires views of at least 500m (English Nature, 2001; Natural England, 2015[32]) in order to feel sufficiently free of predation risk to feed. Additionally, King (2010) highlights a number of factors which significantly correlate with the suitability of sites for waders and Brent geese, and buildings within 500m have a negative effect on the suitability of sites for both waders and Brent geese.

Other plans and projects acting in combination

6.7.13 The following plans/projects identified at the screening stage may also contribute to site-specific impacts:

- Strategic development at Tipner and Horsea Island, Portsmouth
- Eastleigh Borough Adopted Local Plan Review 2001-2011 (adopted 2006)
- Eastleigh Borough Local Plan 2016-2036
- Gosport Borough Local Plan 2011 to 2029 (adopted 2015)
- The Portsmouth Plan (adopted 2012)
- Portsmouth City Draft Local Plan 2019-2036

Distance-based Screening Criteria

6.7.14 Drawing on the previous sections it is possible to devise a series of distance-based screening criteria which are sufficiently precautionary, proportionate and evidence based to determine the

[32] Natural England (2015): *Portsmouth Harbour SPA: Supplementary advice on conserving and restoring site features*. Accessed online [26/9/16] at: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/485360/portsmouth-harbour-spa-supplementary-advice.pdf

likelihood of significant effects from site-specific impacts. These are set out in Table 6.10 and have been applied to the sites proposed for development in the Publication Plan.

Table 6.10: Distance-based screening criteria

Impact	Distance	EU or Core / Primary / Secondary BG / wader site
Habitat loss	0m (within or overlapping site)	Both
Construction pollution	50m or hydrological pathway	EU site
Construction activity	100m	Both
Construction noise	300m	Both
Operational activity	100m	Both
Shortened sight-lines	Waders: 200m Brent goose: 500m	Both

6.7.15 Table 6.11 sets out those site allocations for which European sites or Core / Primary / Secondary support areas / Low Use sites for brent goose and waders fall within the screening distances set out in Table 6.10. In addition, areas of land safeguarded for improvements to the strategic road network (Policy TIN3) are also assessed against these screening criteria. Whilst some European sites or brent goose and wader sites may fall within these screening distances from one or more allocations, this does not necessarily mean that they will experience significant effects; for example, there may be intervening structures or vegetation which sever the potential impact pathway between the allocation and the European site / brent goose and wader site. Sections 6.8 to 6.11.3 go on to identify those site allocations / safeguarded areas of land where European sites and / or Brent goose and wader sites fall within the screening distances <u>and</u> are at risk of significant effects (i.e. there are no intervening features which prevent the effect, based on analysis of aerial imagery and GIS data). These are taken forward for Appropriate Assessment.

Table 6.11: Site Allocations falling within Screening Distances of European Sites and Brent Goose / Wader Sites

Site ID (Allocation)	**Habitat Loss**	**Construction pollution**	**Construction Activity**	**Construction Noise**	**Operational Activity**	**Shortened Sight Lines – Waders**	**Shortened Sight Lines – BG**
-	***0m***	***Hydrological pathway or 50m***	***100m***	***300m***	***100m***	***200m***	***500m***
93 (HA31)	No	BGW	BGW	BGW	BGW	BGW	BGW
124 (E4)	No	No	No	No	No	No	No
203 (HA28)	No	No	No	BGW	No	No	BGW
211 (FTC3)	No	No	No	No	No	No	No
212 (FTC4)	No	No	No	No	No	No	No
1002 (HA43)	No	No	No	No	No	No	BGW
1007 (HA9)	No	No	No	No	No	No	No
1058 (HA22)	No	No	No	No	No	No	No
1070 (HA29)	No	No	No	No	No	No	EU site
1072 (HA19)	No	No	No	No	No	No	No
1075 (HA30)	No	No	No	No	No	No	No
1076 (HA24)	No	No	No	EU site	No	EU Site	EU site
1078 (HA23)	No	BGW	BGW	BGW / EU Site	BGW	BGW	BGW / EU Site
1168 (HA27)	No	No	No	No	No	No	No
1325 (FTC5)	No	No	No	No	No	No	No
1360 (HA15)	No	No	No	No	No	No	No
1425 (FTC2)	No	No	No	EU Site	No	EU Site	EU site
2843 (HA42)	No	No	No	No	No	No	No
2890 (HA32)	No	No	No	EU Site	No	EU Site	BGW / EU Site

Site ID (Allocation)	Habitat Loss	Construction pollution	Construction Activity	Construction Noise	Operational Activity	Shortened Sight Lines – Waders	Shortened Sight Lines – BG
3018 (HA33)	No	No	No	No	No	No	BGW / EU site
3023 (HA17)	No	No	No	No	No	No	No
3030 (HA4)	No	No	No	No	No	No	BGW
3032 (HA12)	No	BGW	BGW	BGW / EU Site	BGW	BGW / EU Site	BGW / EU site
3036 (HA34)	No	No	No	No	No	No	No
3040 (HA40)	No	No	No	No	No	No	No
3049 (HA26)	No	No	No	No	No	No	No
3051 (HA13)	No	No	No	No	No	No	No
3070 (FTC6)	No	No	No	No	No	No	No
3088 (HA7)	No	EU Site (within 50m)	EU Site	EU Site	EU Site	EU Site	BGW / EU Site
3113 (E2)	BGW	BGW	BGW	BGW	BGW	BGW	BGW
3114 (E3)	BGW	BGW	BGW	BGW	BGW	BGW	BGW / EU Site
3121 (HA10)	No	No	No	No	No	No	No
3126 (HA1)	No	EU Site	No	No	No	No	BGW / EU Site
3128 (HA3)	No	EU Site	No	No	No	No	No
3138 (HA45)	No	No	No	EU Site	No	No	BGW / EU Site
3149 (HA35)	No	No	No	No	No	No	No
3206 (HA41)	No	No	No	No	No	No	BGW
3227 (HA36)	No	No	No	No	No	No	No
3228 (HA38)	No	No	No	No	No	No	No
3231 (HA39)	No	No	No	No	No	No	No
3233 (FTC1)	No	No	No	No	No	No	No

Site ID (Allocation)	Habitat Loss	Construction pollution	Construction Activity	Construction Noise	Operational Activity	Shortened Sight Lines – Waders	Shortened Sight Lines – BG
3235 (HA37)	No	No	No	No	No	No	No
3244 (HA44)	No	No	BGW	BGW	BGW	BGW	BGW / EU Site
Land safeguarded for strategic infrastructure							
Delme Roundabout	EU Site	EU Site / BGW	EU Site / BGW	EU Site / BGW	EU Site / BGW	EU Site / BGW	EU Site / BGW
A27 Porchester	No	EU Site / BGW	EU Site / BGW	EU Site / BGW	EU Site / BGW	EU Site / BGW	EU Site / BGW
A27/ Avenue /Redlands / Gudge Heath	No	No	No	No	No	No	No
A27 The Avenue/ Bishopsfield	No	No	No	No	No	No	No
Quay St roundabout	No	No	No	No	No	No	No
Fareham Bus Station	No	No	No	No	No	No	No
Warsash Rd / Abshot Rd	No	No	No	No	No	No	No

6.8 Habitat Loss

6.8.1 Two site allocations will result in habitat loss from a Core / Primary / Secondary support / Low Use Area for Brent goose / wader and could result in likely significant effects during construction:

- Faraday Business Park, Daedalus East (ID: 3113) could potentially displace Brent geese and waders from site F13 which is classified as a Low Use Area; and
- Swordfish Business Park, Daedalus West (ID: 3114) could potentially displace Brent geese and waders from site F13 which is classified as a Low Use Area.

6.8.2 Land safeguarded for improvements to the strategic road network for the Bus Rapid Transit (BRT) Scheme at Delme Roundabout may result in habitat loss from the Solent and Dorset Coast SPA, depending on its design and layout. However, although the land is safeguarded for BRT, this scheme is not promoted by the Local Plan. The impact is therefore screened out of the HRA.

6.9 Aquatic Pollution during Construction

6.9.1 Three of the proposed site allocations are within 50m of, or have known hydrological pathways to, an SAC/SPA/Ramsar, and could result in likely significant effects as a result of aquatic pollution during construction:

- Warsash Maritime Academy (ID:3088) likely to significantly affect Solent Maritime SAC, Solent & Southampton Water SPA/Ramsar, Solent and Dorset Coast SPA.
- North and South of Greenaway Lane, Warsash (ID:3126) likely to significantly affect Solent Maritime SAC, Solent & Southampton Water SPA/Ramsar, Solent and Dorset Coast SPA.
- Southampton Road, Titchfield Common (ID:3128) likely to significantly affect Solent & Southampton Water SPA/Ramsar, Solent and Dorset Coast SPA.

6.9.2 Land safeguarded for improvements to the strategic road network for the Rapid Transit Scheme at Delme Roundabout and the A27 Porchester is within 50m of, and could also result in likely significant effects to:

- Portsmouth Harbour SPA/Ramsar;
- Solent and Dorset Coast SPA; and
- Brent goose and wader site F96 classified as a Low Use Area.

6.9.3 However, although the land is safeguarded for BRT, this scheme is not promoted by the Local Plan. The impacts are therefore screened out of the HRA.

6.10 Construction Noise

6.10.1 Eight of the proposed site allocations are within 300m of an SPA/Ramsar or a Core / Primary / Secondary support / Low Use area for Brent goose / wader and could result in likely significant effects as a result of construction noise:

- Hammond Industrial Park, Stubbington Lane (ID: 93) could potentially displace Brent geese and waders from site F13 which is classified as a Low Use Area.
- Stubbington Lane, Hill Head (ID:1078) could potentially displace Brent geese and waders from site F13 which is classified as a Low Use Area;
- Egmont Nursery, Warsash, Warsash (ID: 2890) likely to significantly affect Solent & Southampton Water SPA/Ramsar;
- Moraunt Drive, Portchester (ID:3032) likely to significantly affect Solent and Dorset Coast SPA and Portsmouth Harbour SPA/Ramsar and could potentially displace Brent geese and waders using site F46A which is classified as a Secondary Support;
- Warsash Maritime Academy (ID:3088) likely to significantly affect Solent and Southampton Water SPA/Ramsar, Solent and Dorset Coast SPA and could potentially displace Brent geese and waders using sites F60, F61 and F62 which are part of the SPA;
- Faraday Business Park, Daedalus East (ID: 3113) could potentially displace Brent geese and waders from remaining sections of site F13 which is classified as a Low Use Area;
- Swordfish Business Park, Daedalus West (ID: 3114) could potentially displace Brent geese and waders from remaining sections of site F13 which is classified as a Low Use Area; and
- Assheton Court, Porchester (ID: 3088) could potentially displace Brent geese and waders from site F45 which is classified as a Low Use Area.

6.10.2 Land safeguarded for improvements to the strategic road network for the Rapid Transit Scheme at Delme Roundabout and the A27 Porchester is within 300m of, and could also result in likely significant effects to:

- Portsmouth Harbour SPA/Ramsar;
- Solent and Dorset Coast SPA; and
- Brent goose and wader site F96 classified as a Low Use Area.

6.10.3 However, although the land is safeguarded for BRT, this scheme is not promoted by the Local Plan. The impacts are therefore screened out of the HRA.

6.11 Construction and Operational Activity

6.11.1 Seven of the proposed site allocations are within 100m of an SPA/Ramsar or a Core / Primary / Secondary support / Low Use area for Brent goose / wader and could result in likely significant effects as a result of construction and operational activity:

- Hammond Industrial Park, Stubbington Lane (ID: 93) could potentially displace Brent geese and waders from site F13 which is classified as a Low Use Area.

- Stubbington Lane, Hill Head (ID:1078) could potentially displace Brent geese and waders from site F13 which is classified as a Low Use Area;
- Moraunt Drive, Portchester (ID:3032) could potentially displace Brent geese and waders using site F46A which is classified as a Secondary Support Area; and
- Warsash Maritime Academy (ID:3088) likely to significantly affect Solent and Southampton Water SPA/Ramsar, and could potentially displace Brent geese and waders using sites F61 and F60 which form part of the SPA.
- Faraday Business Park, Daedalus East (ID: 3113) could potentially displace Brent geese and waders from remaining sections of site F13 which is classified as a Low Use Area;
- Swordfish Business Park, Daedalus West (ID: 3114) could potentially displace Brent geese and waders from remaining sections of site F13 which is classified as a Low Use Area; and
- Assheton Court, Porchester (ID: 3088) could potentially displace Brent geese and waders from site F45 which is classified as a Low Use Area.

6.11.2 Land safeguarded for improvements to the strategic road network for the Rapid Transit Scheme at Delme Roundabout and the A27 Porchester is within 100m of, and could also result in likely significant effects to:

- Portsmouth Harbour SPA/Ramsar;
- Solent and Dorset Coast SPA; and
- Brent goose and wader site F96 classified as a Low Use Area

6.11.3 However, although the land is safeguarded for BRT, this scheme is not promoted by the Local Plan. The impacts are therefore screened out of the HRA.

6.12 Shortened Sight-lines

6.12.1 Three of the proposed site allocations are within 200m or 500m of an SPA/Ramsar or an Important Brent goose / wader site and could result in likely significant effects as a result of shortened sight-lines:

- Warsash Maritime Academy (ID:3088): likely to significantly affect Solent and Southampton Water SPA/Ramsar, and could potentially displace Brent geese and waders using sites F60, F61, F62, F63, F64, F69 and E08;
- Faraday Business Park, Daedalus East (ID: 3113): could potentially displace Brent geese and waders from remaining sections of site F13 which is classified as a Low Use Area; and
- Swordfish Business Park, Daedalus West (ID: 3114) could potentially displace Brent geese and waders from remaining sections of site F13 which is classified as a Low Use Area.

6.13 Screening Conclusions

6.13.1 In conclusion, in the absence of mitigation the Fareham Borough Local Plan is likely to result in a range of significant effects on the European sites of interest, both for strategic and site-specific impacts. The plan will be taken forward to the Appropriate Assessment stage to examine the nature of these effects in further detail. Those impact pathways taken forward for Appropriate Assessment are summarised in Table 6.1.

7 Appropriate Assessment

7.1 Introduction

7.1.1 The following assessment uses the conservation objectives and ecological data for each European site defined in Chapters 3 and 4, and considers these against the range of impact pathways described in Chapter 6. The assessment takes account of incorporated mitigation measures (section 5.3).

7.2 River Itchen SAC

Atmospheric pollution

7.2.1 The source of atmospheric pollution impacts derives from the following policies (Appendix II):

- Housing Allocations HA1 to HA45, and FTC1 to FTC6
- E2 Faraday Business Park
- E3 Swordfish Business Park
- E4 Solent 2

Nutrient nitrogen deposition

7.2.2 Southern damselfly is the only feature listed on APIS with a critical load for nutrient nitrogen deposition. The ecology of the southern damselfly is summarised at section 4.2.2. Its specific habitat requirements are similar in both its heathland and chalk river valley landscapes. These are described by Rushbrook (2017, 2018) as comprising the following:

- Shallow, well oxygenated, base-rich water;
- A constant (perennial) slow to moderate flow of water;
- Channel substrate consisting primarily of silt and detritus;
- Presence of a broad fringe of herbaceous emergent dicotyledon plants along margins;
- Presence of some areas of open water; and
- Largely (but not necessarily completely) unshaded by bankside shrubs and trees.

7.2.3 In order to assess the effects of air pollution on these range of habitat features it is necessary to relate them to the broad habitat types for which there are predictions of the effect of changes in air quality on the APIS website. The closest match broad habitat type is the Fens, Marshes and Swamps habitat. The APIS website provides two Critical Loads for nitrogen deposition within this broad habitat type: This draws the important distinction between Valley mires, poor

fens and transition mires (EUNIS[33] code D2) and Rich fens (EUNIS Code D4.1). The fen habitats within the Itchen Valley used by the southern damselfly do not fall with the D2 EUNIS habitat classification, but are best considered as components of D4.1 Rich fens, for which a Critical Load for nitrogen deposition has been defined at 15-30 kg N/ha/yr. The EUNIS description of D4.1 Rich fens is reproduced in Box 1.

Box 1: EUNIS habitat code and names D4.1 Rich fens, including eutrophic tall-herb fens and calcareous flushes and soaks

Wetlands and spring-mires, seasonally or permanently waterlogged, with a soligenous or topogenous base-rich, often calcareous water supply. Peat formation, when it occurs, depends on a permanently high water table. Rich fens may be dominated by small or larger graminoids (*Carex* spp., *Eleocharis* spp., *Juncus* spp., *Molinia caerulea*, *Phragmites australis*, *Schoenus* spp., *Sesleria* spp.) or tall herbs (e.g. *Eupatorium cannabinum*). Where the water is base-rich but nutrient-poor, small sedges usually dominate the mire vegetation, together with a "brown moss" carpet. Hard-water spring mires (D4.1N) often contain tufa cones and other tufa deposits. Excluded is the water body of hard-water springs (C2.1); calcareous flushes of the alpine zone are a separate category (D4.2). Rich fens are exceptionally endowed with spectacular, specialised, strictly restricted species. They are among the habitats that have undergone the most serious decline. They are essentially extinct in several regions and gravely endangered in much of central and western Europe.

7.2.4 The specific micro-habitat used by the southern damselfly for egg laying is described as a fringe of herbaceous emergent dicotyledon plants. This is likely to be the most vulnerable element of this habitat to nitrogen deposition and nutrient enrichment. Such vegetation is classified by the National Vegetation Classification (NVC; Rodwell (ed.), 1995; Volume 4) as S23 Other Water Margin Vegetation. The NVC describes this vegetation as being characteristically heterogenous, but the most frequent species are Fool's water-cress *Apium nodiflorum*, Water-cress *Rorippa nasturtium-aquaticum* and Brooklime *Veronica beccabunga*. The NVC states; "*The vegetation is most typical of unshaded margins of mesotrophic to eutrophic waters where there is some accumulation of medium to fine textured mineral sediments.*" In other words, this is a vegetation type that is associated with habitats with some degree of nutrient enrichment, typically from agricultural runoff. This community of emergent swamp vegetation is therefore considered a component of the Rich Fen broad habitat type. However, it must be appreciated that this broad habitat type spans a wide spectrum of fen vegetation types ranging from the very nutrient poor sedge dominated fens to the eutrophic fens associated with water margins and nutrient enriched flood plains. In this instance, whereas the habitat used by the southern damselfly falls within the Rich Fen broad habitat type, it is located at the nutrient enriched end of the spectrum of fen vegetation within this habitat.

7.2.5 APIS indicates that the current background nitrogen deposition levels at River Itchen SAC range from 16.01 to 19.85 kgN/ha-year, indicating that the minimum CL for the southern damselfly (15 kgN/ha-year) is exceeded throughout the site. Ricardo (2020)[34] shows the areas where the contribution from the Fareham Borough Local Plan (FBLP), in isolation and in combination, exceeds 1% of the CL for nitrogen deposition. The FBLP in isolation exceedances comprise two

[33] EUNIS denotes European Union Nature Information System Habitat Classification (https://www.eea.europa.eu/data-and-maps/data/eunis-habitat-classification)

[34] Ricardo (2020): *Air Quality Habitat Regulations Assessment for the Fareham Borough Local Plan 2036*. July 2020

very small areas in the centre of the M27, where it crosses the River Itchen. The FBLP in combination exceedances comprise four main areas of exceedance: two larger areas around Bishopstoke and where the M27 crosses the river, and two smaller areas adjacent to Chicken Hall Lane (behind Barton Park Industrial Estate) and where Woodmill Lane crosses the river at Woodmill Outdoor Activities Centre. The maximum contribution of the FBLP in isolation in the three northerly exceedance areas is <0.00375 kgN/ha/yr (or <0.025% of the lowest CL); these exceedances are considered to be so small as to be unlikely to result in any distinguishable effect on the southern damselfly habitat in these locations.

7.2.6 The maximum contribution along the M27 in the south is 0.243 kgN/ha/yr (or 1.62% of the lowest CL). In other words the amount of exceedance over the screening threshold is not substantial, even under the worst-case in combination scenario.

7.2.7 Water courses in the vicinity of the M27 within the Itchen Valley Country Park were visited to the north and south of the motorway during the HRA[35] for the Eastleigh Borough Local Plan. The water course to the north of the motorway was found to be in relatively poor condition for southern damselfly with marginal vegetation dominated by tall reed and sedge species including reed sweet-grass (*Glyceria maxima*), lesser pond-sedge (*Carex acutiformis*), common reed (*Phragmites australis*) and clumps of water-dock (*Rumex hydrolapathum*). These had all developed on wide silt berms that had accumulated along the margins of the water course. This appeared likely to be due to the effect of the motorway bridge on flow rate upstream of the bridge leading to increased silt deposition. Downstream of the bridge, the water course was also in relatively poor condition, again with the marginal berms dominated by tall fen species dominated by lesser pond-sedge.

7.2.8 In both locations adjacent to the motorway bridge, the soft fleshy aquatic plants preferred for egg laying by the southern damselfly were rare or absent with the habitat being dominated by tall fen vegetation. It was apparent that silt deposition, water quality and fluvial processes were the predominant influences on the habitat. There was no evidence of elevated nutrient enrichment affecting the marginal swamp vegetation on these two transects in the vicinity of the motorway.

7.2.9 A small ditch on the west side of the flood plain was investigated on the south side of the motorway bridge. This is reported by the Country Park staff to take some surface water drainage from the motorway. It was found to have imperceptible levels of flow at the time of survey, but had a heavily silted bed and supported a dense growth of branched bur-reed (*Sparganium erectum*). This is a swamp community of eutrophic conditions that is tolerant of pollution by sewage and some industrial effluents (Haslam, 1978[36]). If air pollution was having a significant effect on the margins of the other two water courses, it might be expected that these would also show an increased growth of branched bur-reed. The absence of this species suggests they are not subject to the elevated nutrient levels seen in the ditch that takes drainage from the motorway.

[35] Urban Edge Environmental Consulting (2019): *Habitats Regulations Assessment for the Eastleigh Borough Local Plan 2016 – 2036: HRA Report for the Submission Plan*. June 2019.

[36] Haslam, S.M. (1978) *River Plants*. Cambridge University Press.

7.2.10 An area of better quality habitat further north from the motorway was noted to have much better developed marginal swamp vegetation for southern damselfly with a greater abundance of both fools watercress (*Apium nodiflorum)* and watercress (*Rorippa nasturtium-aquaticum*). This more suitable habitat is likely to be related to better flow conditions on this section of the watercourse, and possibly more recent marginal vegetation management.

7.2.11 The marginal swamp vegetation upon which the southern damselfly depends for egg laying is an aquatic vegetation type that grows from within the watercourse and hence largely derives its nutrients from the water in which it grows. Nitrate is in excess in these environments with phosphate being the limiting plant nutrient. Nitrate concentrations in the River Itchen are in the range of 4.5-5.5 mg/l[37] whilst phosphate levels are <0.1 mg/l. Small increases (<0.025 kgN/ha/yr to 0.243 kgN/ha/yr) in nitrogen deposition from air pollution in restricted locations close to the road corridors are therefore unlikely to have a significant adverse effect on the growth of this vegetation.

7.2.12 The APIS website provides guidance on nitrate critical loads for standing waters. It states; "*Deposition of ammonia, nitrate and other forms of nitrogen from the atmosphere is unlikely to be the largest source of this nutrient to eutrophic standing waters (Gibson et al. 1992, Gibson et al. 1995, Jordan 1997*[38]*) and, therefore, in general, N deposition is unlikely to be very harmful to eutrophic standing waters, even when close to sources.*" Although the water in which the southern damselfly habitat grows is flowing it can be concluded that, in the small slow flowing water courses in which this habitat is found, nitrogen deposition is unlikely to be harmful.

7.2.13 The APIS website does not provide guidance on nitrate critical loads for flowing waters, but states; "*In most lowland rivers and burns, nitrogen inputs from catchment land-use, not deposition from the atmosphere, are likely to be much more significant (Strong et al. 1997, Smith & Stewart 1989, Foy et al. 1982*[39]*).*"

7.2.14 There is no apparent transition or gradient in marginal swamp vegetation composition or structure related to the distance from the highway at any of the three sites visited. The vegetation is far more affected by fluvial process in the water course, in particular sediment deposition, bank shading and vegetation management intervention, including grazing by livestock and ditch clearance. Against these factors, the relatively small changes in nitrogen deposition predicted to result from changes in road traffic are considered to be insignificant.

[37] River Itchen Sustainability Study (2004), Water Quality Technical Appendix, Halcrow Ltd
[38] Gibson, C.E.; Smith, R.V.; Stewart, D.A. 1992 nitrogen cycle in Lough Neagh, N. Ireland, 1975 to 1987 Int. Revue ges. Hydrobiol 77 73-83
Gibson, C.E.; Wu, Y.; Smith, S.J.; Wolfe-Murphy, S.A. 1995 Synoptic limnology of a diverse geological region: catchment and water chemistry Hydrobiologia 306 213-227
Jordan, C. 1997 Mapping of rainfall chemistry in Ireland 1972-94 Biology and Environment: Proceedings of the Royal Irish Academy 97B 53-73
[39] Foy, R.; Smith, R.V.; Stevens, R.J. 1982 Identification of factors affecting nitrogen and phosphorus loadings to Lough Neagh Journal of Environmental Management 15 109-129
Smith, R.V.; Stewart, D.A. 1989 A regression model for nitrate leaching in Northern Ireland. Soil Use and Management 5 71-76
Strong, K.M.; Lennox, S.D.; Smith, R.V. 1997 Predicting nitrate concentrations in Northern Ireland rivers using time series analysis Journal of Environmental Quality 26 1599-1604

Airborne NOx

7.2.15 The FBLP contribution in isolation was not predicted to exceed the screening threshold for airborne NOx, only in combination (Ricardo, 2020). The concentration of atmospheric NOx can have an impact on terrestrial vegetation; however, it is not clear how this would affect aquatic and semi-aquatic vegetation. With the exception of the Southern damselfly, all of the other sensitive features listed on APIS are aquatic species with the "rivers and streams" broad habitat; it is not anticipated that air pollution impacts from road traffic would accumulate to a significant degree in this broad habitat (Ricardo, 2020). It is likely that deposition of nitrogen will have a greater impact on these habitats than atmospheric NOx concentrations, indeed, nitrogen deposition rates are linked to atmospheric NOx concentration. This assessment has therefore only considered nitrogen deposition as this is considered the best indicator of ecological impact of the changes in air quality predicted by Ricardo (2020).

Airborne ammonia

7.2.16 Ricardo (2020) states that the modelled FBLP in combination contribution of airborne NH_3 was added to background levels of ammonia across the site (obtained from APIS). The maximum total concentration of NH_3 for the FBLP in combination is 2.29 µg/m^3, which is 76.2% of the CL of 3 µg/m^3. Ricardo (2020) concludes that, on the basis of available evidence, including background ammonia concentrations, there are no adverse effects on this SAC site arising from increased ammonia associated with the FBLP in combination.

Table 7.1: Appropriate Assessment in view of conservation objectives: River Itchen SAC

Assessment of impacts on the River Itchen SAC conservation objectives
The extent and distribution of qualifying natural habitats and habitats of qualifying species The extent and distribution of southern damselfly habitat is unlikely to be affected by the indistinguishable to small increase in nitrogen deposition in very restricted locations predicted to result from the Local Plan.
The structure and function (including typical species) of qualifying natural habitats [N/A: The Annex 1 habitat was screened out as not vulnerable to nitrogen deposition]
The structure and function of the habitats of qualifying species The structure and function of southern damselfly habitat within the small area of maximum (1.62%) exceedance zone is overwhelmingly influenced by other external factors including river water quality, fluvial characteristics and river and land management practices. Changes in atmospheric nitrogen deposition are not likely to have an adverse effect on southern damselfly habitat structure and function.
The supporting processes on which qualifying natural habitats and the habitats of qualifying species rely River and land management processes and natural succession are considered to have the determining influence on southern damselfly habitat quality. Nitrogen deposition levels are already exceeding Critical Load and likely to be in excess in aquatic environment, where phosphate is the limiting nutrient. Increased nitrogen deposition will not therefore have an adverse effect on processes supporting the southern damselfly habitat.
The populations of qualifying species Nitrogen deposition resulting from the Local Plan is unlikely to have any direct or indirect effect on

Assessment of impacts on the River Itchen SAC conservation objectives
individual southern damselflies or their habitats, and hence their abundance will be unaffected by predicted changes in nitrogen deposition.
The distribution of qualifying species within the site   Nitrogen deposition resulting from the Local Plan is unlikely to have any direct or indirect effect on individual southern damselflies or their habitats, and hence their distribution within the site will be unaffected by predicted changes in nitrogen deposition.

Conclusions of assessment against the River Itchen SAC conservation objectives

7.2.17 It is concluded that there will be no adverse effect on the integrity of the SAC for this species as a consequence of predicted changes in air quality arising from implementation of the Fareham Borough Local Plan, either alone or in combination with other plans and projects.

7.3 Solent Maritime SAC

Atmospheric pollution

7.3.1 The source of atmospheric pollution impacts derives from the following policies (Appendix II):

- Housing Allocations HA1 to HA45, and FTC1 to FTC6
- E2 Faraday Business Park
- E3 Swordfish Business Park
- E4 Solent 2

7.3.2 The Annex 1 habitat Perennial vegetation of stony banks is the most sensitive qualifying feature to nutrient nitrogen deposition (CL=8kgN/ha/yr) and is the only feature within Solent Maritime SAC with a vulnerability to acid deposition (CL=0.626 MinCLMaxN, kEq/ha/yr) according to APIS. Most of the features have a CL of 3 µg/m^3 for ammonia and all features have a CL of 30 µg/m^3 for NOx.

Airborne ammonia

7.3.3 None of the vulnerable qualifying features are present in the locations where the total Predicted Environmental Concentration (i.e. FBLP in combination plus background levels) exceeds the Critical Level (Ricardo, 2020).

Airborne NOx

7.3.4 None of the vulnerable qualifying features are present in the locations where the total Predicted Environmental Concentration (i.e. FBLP in combination plus background levels) exceeds the Critical Level (Ricardo, 2020).

Nutrient nitrogen deposition

7.3.5 The maximum contribution of the FBLP in combination in Area 1 (Farlington Marshes) is <0.002 kgN/ha/yr, and in Area 3 (River Test) is <0.002 kgN/ha/yr, both amounts being <0.025% of the lowest CL; these exceedances are considered to be so small as to be unlikely to result in any distinguishable effect on the qualifying features present in these locations (Ricardo, 2020).

7.3.6 In Area 2 (River Hamble, M27 crossing and at Curbridge Creek) the maximum contribution of the FBLP in combination exceeds the 1% CL for Perennial vegetation of stony banks and Shifting dunes along the shoreline with *Ammophila arenaria*. However, neither habitat is present these locations.

Acid deposition

7.3.7 The maximum contribution of the FBLP in combination in Area 1 (Farlington Marshes) is < 0.0001565 kEq/ha/yr, and in Area 3 (River Test) is <0.0001565 kEq/ha/yr, both amounts being <0.025% of the lowest CL; these exceedances are considered to be so small as to be unlikely to result in any distinguishable effect on the qualifying features present in these locations. (Ricardo, 2020).

7.3.8 In Area 2 (River Hamble, M27 crossing and at Curbridge Creek) the maximum contribution of the FBLP in combination exceeds the 1% CL for Perennial vegetation of stony banks and Shifting dunes along the shoreline with *Ammophila arenaria*. However, neither habitat is present these locations.

Water pollution

7.3.9 The source of water pollution impacts derives from the following policies (Appendix II):

- Housing Allocations HA1 to HA45, and FTC1 to FTC6

Site specific impacts

7.3.10 The following site allocations were considered likely to significantly affect the Solent Maritime SAC as a result of construction pollution in the absence of mitigation:

- Warsash Maritime Academy (ID:3088); and
- North and South of Greenaway Lane, Warsash (ID:3126).

Table 7.2: Appropriate Assessment in view of conservation objectives: Solent Maritime SAC

Assessment of impacts on the Solent Maritime SAC conservation objectives
<u>The extent and distribution of qualifying natural habitats and habitats of qualifying species</u>
None of the qualifying habitats or habitats or qualifying species will be significantly or adversely affected by predicted airborne pollutants or deposition resulting from traffic associated with the Local Plan. Their extent and distribution will therefore be unaffected by the Local Plan.
Growth projections are not expected to result in impacts on the SAC via nutrient nitrogen pollution in the short term, however, Peel Common WWTW (serving Eastleigh, Fareham, Gosport, Test Valley and Winchester) is predicted to reach capacity by 2025 at which point a review of N permit will be required.

Assessment of impacts on the Solent Maritime SAC conservation objectives
Recently implemented (2014/2015) measures for improvements at Pennington WWTW, Peel Common WWTW, Eastney/Budds Farm WWTW and several in Southampton Water, will all reduce N inputs into the Solent. No adverse effects to the extent and distribution of qualifying natural habitats or habitats of qualifying species are likely in the short term, however, the capacity constraint at Peel Common means it is not possible to rule out the potential for adverse effects later in the plan period. The nitrogen budget for the Fareham Local Plan suggests that developments allocated in the plan will lead to a surplus of 2,536.99 kg/TN/yr over the plan period, exacerbating the macroalgal blooms which smother the intertidal mudflats (reducing the availability of epifaunal prey) and increase their vulnerability to erosion. However, policy NE4's requirement for all development which results in an increase in overnight accommodation to be nutrient neutral will adequately avoid the risk of adverse effects occurring; further information on how the nutrient budget was calculated and the schemes which are coming forward to enable nutrient neutral development to be delivered is presented in Appendix III. A major pollution event during construction of two sites at Warsash could theoretically be so severe as to reduce the extent and distribution of the Annex 1 habitat within the SAC, though such events are unusual and there is limited evidence for construction-related impacts in recent site condition assessments. Taking account of incorporated mitigation measures (i.e. the requirement for Construction Environmental Management Plans), adverse effects on the Annex 1 habitats are unlikely to occur. Desmoulin's whorl snail is unlikely to be affected due to its restricted distribution (Fishbourne Channel in Chichester Harbour) and possible local extinction (see section 4.2).
The structure and function (including typical species) of qualifying natural habitats The structure and function of Annex 1 habitats will not be significantly or adversely affected by predicted airborne pollutants or deposition resulting from traffic associated with the Local Plan. No adverse effects on the structure and function of qualifying natural habitats resulting from excess nitrogen pollution in the marine environment are likely in the short term, however, in the absence of mitigation the capacity constraint at Peel Common means it is not possible to rule out the potential for adverse effects later in the plan period. Incorporated mitigation measures are considered adequate to avoid the risk of adverse effects occurring. The structure and function of Annex 1 habitats could be indirectly affected by a major pollution event during construction at two sites at Warsash. However, taking account of incorporated mitigation measures, adverse effects are unlikely to occur.
The structure and function of the habitats of qualifying species Desmoulin's whorl snail is unlikely to be affected due to its restricted distribution (Fishbourne Channel in Chichester Harbour) and possible local extinction (see section 4.2).
The supporting processes on which qualifying natural habitats and the habitats of qualifying species rely The processes supporting the Annex 1 habitats will not be significantly or adversely affected by predicted airborne pollutants or deposition resulting from traffic associated with the Local Plan. The supporting processes on which qualifying habitats/species rely is unlikely to be adversely affected by excess nitrogen pollution in the marine environment in the short term, however, the capacity constraint at Peel Common means it is not possible to rule out the potential for adverse effects later in the plan period. Incorporated mitigation measures are considered adequate to avoid the risk of adverse effects occurring. A major pollution event during construction at two sites at Warsash could alter water chemistry, though there is limited evidence for construction-related impacts in recent site condition assessments, and

Assessment of impacts on the Solent Maritime SAC conservation objectives
such an effect is likely to be temporary. Taking account of incorporated mitigation measures (i.e. the requirement for Construction Environmental Management Plans), adverse effects on the Annex 1 habitats are unlikely to occur.
The populations of qualifying species ***The distribution of qualifying species within the site*** Desmoulin's whorl snail is unlikely to be affected due to its restricted distribution (Fishbourne Channel in Chichester Harbour) and possible local extinction (see section 4.2).

Conclusions of assessment against the Solent Maritime SAC conservation objectives

7.3.11 It is concluded that there will be no adverse effect on the integrity of the SAC as a consequence of predicted changes in air quality, water pollution or site specific impacts arising from implementation of the Fareham Borough Local Plan, either alone or in combination with other plans and projects.

7.4 The New Forest SAC/Ramsar

Atmospheric pollution

7.4.1 The source of atmospheric pollution impacts derives from the following policies (Appendix II):

- Housing Allocations HA1 to HA45, and FTC1 to FTC6
- E2 Faraday Business Park
- E3 Swordfish Business Park
- E4 Solent 2

7.4.2 The Annex 1 habitat Oligotrophic to mesotrophic standing waters with vegetation of the *Littorelletea uniflorae* and/or of the *Isoeto-Nanojuncetea* is the most sensitive qualifying feature within New Forest SAC to nutrient nitrogen deposition (CL=3kgN/ha/yr). The Annex 1 habitats Bog woodland, Transition mires and quaking bogs and Depressions on peat substrates of the *Rhynchosporion* are the most sensitive qualifying features to acid deposition (CL=0.547 MinCLMaxN, kEq/ha/yr) according to APIS. Most of the features have a CL of 1 µg/m^3 for ammonia and all features have a CL of 30 µg/m^3 for NOx.

Airborne ammonia

7.4.3 The maximum contribution of the FBLP in combination is <0.0000662 µg/m^3 which is <0.025% of the lowest CL; these exceedances are considered to be so small as to be unlikely to result in any distinguishable effect on the qualifying features present in these locations (Ricardo, 2020).

Airborne NOx

7.4.4 The maximum contribution of the FBLP in combination is <0.00673µg/m^3 which is <0.025% of the lowest CL; these exceedances are considered to be so small as to be unlikely to result in any distinguishable effect on the qualifying features present in these locations (Ricardo, 2020).

Nutrient nitrogen deposition

7.4.5 The maximum contribution of the FBLP in combination is <0.000673kgN/ha/yr which is <0.025% of the lowest CL; these exceedances are considered to be so small as to be unlikely to result in any distinguishable effect on the qualifying features present in these locations (Ricardo, 2020).

Acid deposition

7.4.6 The maximum contribution of the FBLP in combination is <0.0000479kEq/ha/yr which is <0.025% of the lowest CL; these exceedances are considered to be so small as to be unlikely to result in any distinguishable effect on the qualifying features present in these locations. (Ricardo, 2020).

Table 7.3: Appropriate Assessment in view of conservation objectives: New Forest SAC/Ramsar

Assessment of impacts on the New Forest SAC/Ramsar conservation objectives
The extent and distribution of qualifying natural habitats and habitats of qualifying species None of the qualifying habitats or habitats or qualifying species will be significantly or adversely affected by predicted airborne pollutants or deposition resulting from traffic associated with the Local Plan. Their extent and distribution will therefore be unaffected by the Local Plan.
The structure and function (including typical species) of qualifying natural habitats ***The structure and function of the habitats of qualifying species*** The structure and function of Annex 1 habitats, and of the habitats of Annex 2 species, will not be significantly or adversely affected by predicted airborne pollutants or deposition resulting from traffic associated with the Local Plan.
The supporting processes on which qualifying natural habitats and the habitats of qualifying species rely The processes supporting the Annex 1 habitats and the habitats of Annex 2 species will not be significantly or adversely affected by predicted airborne pollutants or deposition resulting from traffic associated with the Local Plan.
The populations of qualifying species The abundance of Annex 2 species will not be affected by traffic associated with the Local Plan.
The distribution of qualifying species within the site The distribution of Annex 2 species within the site will not be affected by traffic associated with the Local Plan.

Conclusions of assessment against the New Forest SAC/Ramsar conservation objectives

7.4.7 It is concluded that there will be no adverse effect on the integrity of the SAC/Ramsar as a consequence of predicted changes in air quality arising from implementation of the Fareham Borough Local Plan, either alone or in combination with other plans and projects.

7.5 The New Forest SPA

Atmospheric pollution

7.5.1 The source of atmospheric pollution impacts derives from the following policies (Appendix II):

- Housing Allocations HA1 to HA45, and FTC1 to FTC6
- E2 Faraday Business Park
- E3 Swordfish Business Park
- E4 Solent 2

7.5.2 Breeding nightjar and woodlark are the most sensitive qualifying features within New Forest SPA to nutrient nitrogen deposition (CL=5kgN/ha/yr). The same species along with hen harrier, hobby and Dartford warbler are the most sensitive qualifying features to acid deposition (CL=0.862 MinCLMaxN, kEq/ha/yr) according to APIS. All of the features have a CL of 3 µg/m^3 for ammonia and all features have a CL of 30 µg/m^3 for NOx.

Airborne ammonia

7.5.3 The maximum contribution of the FBLP in combination is <0.0000662 µg/m^3 which is <0.025% of the lowest CL; these exceedances are considered to be so small as to be unlikely to result in any distinguishable effect on the qualifying features present in these locations (Ricardo, 2020).

Airborne NOx

7.5.4 The maximum contribution of the FBLP in combination is <0. 00661 µg/m^3 which is <0.025% of the lowest CL; these exceedances are considered to be so small as to be unlikely to result in any distinguishable effect on the qualifying features present in these locations (Ricardo, 2020).

Nutrient nitrogen deposition

7.5.5 The maximum contribution of the FBLP in combination is <0.000673kgN/ha/yr which is <0.025% of the lowest CL; these exceedances are considered to be so small as to be unlikely to result in any distinguishable effect on the qualifying features present in these locations (Ricardo, 2020).

Acid deposition

7.5.6 The maximum contribution of the FBLP in combination is <0.0000479kEq/ha/yr which is <0.025% of the lowest CL; these exceedances are considered to be so small as to be unlikely to result in any distinguishable effect on the qualifying features present in these locations. (Ricardo, 2020).

Table 7.4: Appropriate Assessment in view of conservation objectives: New Forest SPA

Assessment of impacts on the New Forest SPA conservation objectives
<u>The extent and distribution of the habitats of the qualifying features</u>
None of the habitats of qualifying features will be significantly or adversely affected by predicted airborne pollutants or deposition resulting from traffic associated with the Local Plan. Their extent and

Assessment of impacts on the New Forest SPA conservation objectives
distribution will therefore be unaffected by the Local Plan.
The structure and function of the habitats of the qualifying features The structure and function of the habitats of qualifying features will not be significantly or adversely affected by predicted airborne pollutants or deposition resulting from traffic associated with the Local Plan.
The supporting processes on which the habitats of the qualifying features rely The processes supporting the habitats of qualifying features will not be significantly or adversely affected by predicted airborne pollutants or deposition resulting from traffic associated with the Local Plan.
The population of each of the qualifying features The abundance of qualifying features will not be affected by traffic associated with the Local Plan.
The distribution of the qualifying features within the site The distribution of qualifying features within the site will not be affected by traffic associated with the Local Plan.

Conclusions of assessment against the New Forest SPA conservation objectives

7.5.7 It is concluded that there will be no adverse effect on the integrity of the SPA as a consequence of predicted changes in air quality arising from implementation of the Fareham Borough Local Plan, either alone or in combination with other plans and projects.

7.6 Chichester & Langstone Harbours SPA/Ramsar

Strategic disturbance

7.6.1 The source of strategic disturbance impacts derives from the following policies (Appendix II):

- Housing Allocations HA1 to HA45, and FTC1 to FTC6

Table 7.5: Appropriate Assessment in view of conservation objectives: Chichester & Langstone Harbours SPA/Ramsar

Assessment of impacts on the Chichester & Langstone Harbours SPA/Ramsar conservation objectives
The extent and distribution of the habitats of the qualifying features The Local Plan is unlikely to alter the extent and distribution of the habitats of the Chichester & Langstone Harbours SPA/Ramsar overwintering wildfowl and wading bird populations as a result of increased disturbance.
The structure and function of the habitats of the qualifying features The plan has the potential to alter the structure and function of the habitats of the Chichester & Langstone Harbours SPA/Ramsar overwintering wildfowl and wading bird populations. The impact could be indirect and permanent or reversible as a result of increased footfall within the site, leading to trampling of vegetation, soil compaction and erosion; or be direct, intermittent and reversible due to increased human/dog activity leading to displacement of the birds from otherwise suitable feeding or roosting habitats. The impact is very likely act in combination with other plans and projects. The magnitude of the potential impact is uncertain but potentially large (a minimum of 8,389 dwellings

Assessment of impacts on the Chichester & Langstone Harbours SPA/Ramsar conservation objectives
within 5.6km of the SPA/Ramsar), especially in combination, and is likely to continue year-round. The risk of adverse effects on integrity is high. However, counteracting measures were devised in cooperation with Natural England and other local planning authority members of the Solent Recreation Mitigation Partnership, and have been incorporated into the plan via proposed policy NE3, and are considered likely to effectively avoid and mitigate the impact.
The supporting processes on which the habitats of the qualifying features rely The plan is unlikely to significantly undermine the processes which support the habitats of the Chichester & Langstone Harbours SPA/Ramsar overwintering wildfowl and wading bird populations, although minor indirect impacts are possible through trampling, soil compaction and erosion.
The population of each of the qualifying features The Chichester & Langstone Harbours SPA/Ramsar overwintering wildfowl and wading bird populations could potentially be reduced via increased energetic expenditure and starvation risk, leading to a fall in winter survival rates as a result of increased disturbance. The magnitude of the potential impact is uncertain but likely to be significant. The impact is very likely act in combination with other plans and projects. However, counteracting measures have been incorporated into the plan and are considered likely to effectively avoid and mitigate the impact.
The distribution of the qualifying features within the site Without mitigation, the distribution of the Chichester & Langstone Harbours SPA/Ramsar overwintering wildfowl and wading bird populations within the site is likely to be altered as birds are displaced from otherwise suitable habitats in response to increased disturbance, and the impact is very likely act in combination with other plans and projects. However, counteracting measures have been incorporated into the plan and are considered likely to effectively avoid and mitigate the impact.

Conclusions of assessment against the Chichester & Langstone Harbours SPA/Ramsar conservation objectives

7.6.2 It is concluded that there will be no adverse effect on the integrity of the SPA/Ramsar as a consequence of strategic disturbance arising from implementation of the Fareham Borough Local Plan, either alone or in combination with other plans and projects.

7.7 Portsmouth Harbour SPA/Ramsar

Atmospheric pollution

7.7.1 The source of atmospheric pollution impacts derives from the following policies (Appendix II):

- Housing Allocations HA1 to HA45, and FTC1 to FTC6
- E2 Faraday Business Park
- E3 Swordfish Business Park
- E4 Solent 2

7.7.2 The overwintering populations of dark-bellied brent goose, red-breasted merganser, dunlin and black-tailed godwit all rely on habitats which are sensitive to nutrient nitrogen deposition (CL=20kgN/ha/yr) but none of them are sensitive to acid deposition according to APIS. All of the features have a CL of 3 µg/m^3 for ammonia and all features have a CL of 30 µg/m^3 for NOx.

Airborne ammonia

7.7.3 Ricardo (2020) states that the modelled FBLP in combination contribution of airborne NH_3 was added to background levels of ammonia across the site (obtained from APIS). The maximum total concentration of NH_3 for the FBLP in combination is 2.30 µg/m^3, which is 76.7% of the CL of 3 µg/ m^3. Ricardo (2020) concludes that, on the basis of available evidence, including background ammonia concentrations, there are no adverse effects on this SAC site arising from increased ammonia associated with the FBLP in combination.

Nitrogen deposition

7.7.4 None of the vulnerable qualifying features are present in the locations where the total Predicted Environmental Concentration (i.e. FBLP in combination plus background levels) exceeds the Critical Level (Ricardo, 2020).

Airborne NOx

7.7.5 The modelled contribution from the FBLP, in isolation and in combination, is predicted to exceed 0.3 µg/ m^3 (1% of 30 µg/ m^3) in five main areas:

- the area in the west comprises three small zones of exceedance (Fareham Creek): most of this area coincides with intertidal mudflats which would be regularly inundated with tidal water, preventing accumulation of any deposited pollutants. However a small section in the north-western part of the creek is not intertidal. In this location the total Predicted Environmental Concentration (i.e. FBLP in combination plus background levels) does not exceed the Critical Level (Ricardo, 2020);
- one area in the north (Port Solent): this coincides with intertidal mudflats which would be regularly inundated with tidal water, preventing accumulation of any deposited pollutants;
- one small area in the south (Gosport): this coincides with intertidal mudflats which would be regularly inundated with tidal water, preventing accumulation of any deposited pollutants; and
- two larger areas in the east of the site (north and south of Tipner Lake): most of this area coincides with intertidal mudflats which would be regularly inundated with tidal water, preventing accumulation of any deposited pollutants. However a small area west of the M275 is not intertidal. In this location the total Predicted Environmental Concentration (i.e. FBLP in combination plus background levels) does not exceed the Critical Level (Ricardo, 2020). Another area east of the M275 is not intertidal. In this location the total Predicted Environmental Concentration (i.e. FBLP in combination plus background levels) does exceed the Critical Level (Ricardo, 2020) over approx. 0.003 ha of coastal saltmarsh. However Natural England has confirmed that due to the size of the area affected, the habitats present, and the abundance of coastal saltmarsh elsewhere in the site, no adverse

effects should be expected arising from increased airborne NOx as a result of the FBLP in isolation or in combination.

Strategic disturbance

7.7.6 The source of strategic disturbance impacts derives from the following policies (Appendix II):

- Housing Allocations HA1 to HA45, and FTC1 to FTC6

Site specific impacts

7.7.7 The following site allocations were considered likely to significantly affect the Portsmouth Harbour SPA/Ramsar as a result of construction noise / displacement in the absence of mitigation:

- Moraunt Drive, Portchester (ID:3032): construction noise;
- Faraday Business Park, Daedalus East (ID: 3113): displacement from F13;
- Swordfish Business Park, Daedalus West (ID: 3114): displacement from F13; and
- Assheton Court, Porchester (ID: 3244): construction noise, displacement from F45.

Table 7.6: Appropriate Assessment in view of conservation objectives: Portsmouth Harbour SPA/Ramsar

Assessment of impacts on the Portsmouth Harbour SPA/Ramsar conservation objectives
The extent and distribution of the habitats of the qualifying features None of the habitats of qualifying features will be adversely affected by predicted airborne pollutants or deposition resulting from traffic associated with the Local Plan. Their extent and distribution will therefore be unaffected by the Local Plan. The Local Plan is unlikely to alter the extent and distribution of the habitats of the Portsmouth Harbour SPA/Ramsar overwintering Brent goose, dunlin, black-tailed godwit or red-breasted merganser populations as a result of increased disturbance. Construction noise is unlikely to physically affect the extent or distribution of Brent goose, dunlin, black-tailed godwit or red-breasted merganser habitats within the SPA/Ramsar. However, the permanent or temporary loss of or displacement from functionally-linked Brent goose / wader sites as a result of development would, in combination with other plans and projects, prevent the site's conservation objectives from being achieved. Taking account of incorporated mitigation measures (i.e. the requirement for Construction Environmental Management Plans, protection of functionally-linked land through NE5, and sensitively designed development in relation to scale, form and massing), adverse effects are unlikely to occur.
The structure and function of the habitats of the qualifying features The structure and function of the habitats of qualifying features will not be adversely affected by predicted airborne pollutants or deposition resulting from traffic associated with the Local Plan. The plan has the potential to alter the structure and function of the habitats of the Portsmouth Harbour SPA/Ramsar overwintering Brent goose, dunlin, black-tailed godwit or red-breasted merganser populations. The impact could be indirect and permanent or reversible as a result of increased footfall within the site, leading to trampling of vegetation, soil compaction and erosion; or be direct, intermittent and reversible due to increased human/dog activity leading to displacement of the birds from otherwise suitable feeding or roosting habitats. The impact is very likely act in combination with

Assessment of impacts on the Portsmouth Harbour SPA/Ramsar conservation objectives
other plans and projects. The magnitude of the potential impact is uncertain but potentially large (a minimum of 8,389 dwellings within 5.6km of the SPA/Ramsar), especially in combination, and is likely to continue year-round. The risk of adverse effects on integrity is high. However, counteracting measures were devised in cooperation with Natural England and other local planning authority members of the Solent Recreation Mitigation Partnership, and have been incorporated into the plan via proposed policy NE3, and are considered likely to effectively avoid and mitigate the impact. The extent of impacts from construction noise and its effects on overwintering wildfowl and waders and breeding gulls and terns, are likely to be highly site specific and dependent on detailed design information which is not currently available. However, there is a risk of functional loss whereby otherwise suitable habitat is rendered unusable by qualifying species as they avoid increases in perceived predation risk.
The supporting processes on which the habitats of the qualifying features rely The processes supporting the habitats of qualifying features will not be adversely affected by predicted airborne pollutants or deposition resulting from traffic associated with the Local Plan. The plan is unlikely to significantly undermine the processes which support the habitats of the Portsmouth Harbour SPA/Ramsar overwintering Brent goose, dunlin, black-tailed godwit or red-breasted merganser populations, although minor indirect impacts are possible through trampling, soil compaction and erosion. Construction noise and displacement are unlikely to affect the processes supporting the birds' habitats within the SPA/Ramsar.
The population of each of the qualifying features The abundance of qualifying features will not be affected by traffic associated with the Local Plan. The Portsmouth Harbour SPA/Ramsar overwintering Brent goose, dunlin, black-tailed godwit or red-breasted merganser populations could potentially be reduced via increased energetic expenditure and starvation risk, leading to a fall in winter survival rates as a result of increased disturbance. The magnitude of the potential impact is uncertain but likely to be significant. The impact is very likely act in combination with other plans and projects. However, counteracting measures have been incorporated into the plan and are considered likely to effectively avoid and mitigate the impact. Construction noise and displacement are, in combination, likely to limit the ability of Brent goose, dunlin, black-tailed godwit or red-breasted merganser to feed or rest sufficiently, and risk reducing the overall population of each species with the site. But, taking account of incorporated mitigation measures, adverse effects are unlikely to occur.
The distribution of the qualifying features within the site The distribution of qualifying features within the site will not be affected by traffic associated with the Local Plan. Without mitigation, the distribution of the Portsmouth Harbour SPA/Ramsar overwintering Brent goose, dunlin, black-tailed godwit or red-breasted merganser populations within the site is likely to be altered as birds are displaced from otherwise suitable habitats in response to increased disturbance, and the impact is very likely act in combination with other plans and projects. However, counteracting measures have been incorporated into the plan and are considered likely to effectively avoid and mitigate the impact. Construction noise and displacement are, in combination, likely to have the potential to alter the distribution of each species with the site, especially in combination, but incorporated mitigation measures are considered to prevent adverse effects from occurring.

Conclusions of assessment against the Portsmouth Harbour SPA/Ramsar conservation objectives

7.7.8 It is concluded that there will be no adverse effect on the integrity of the SPA/Ramsar as a consequence of predicted changes in air quality, strategic disturbance or site specific impacts arising from implementation of the Fareham Borough Local Plan, either alone or in combination with other plans and projects.

7.8 Solent & Dorset Coast SPA

Atmospheric pollution

7.8.1 The source of atmospheric pollution impacts derives from the following policies (Appendix II):

- Housing Allocations HA1 to HA45, and FTC1 to FTC6
- E2 Faraday Business Park
- E3 Swordfish Business Park
- E4 Solent 2

7.8.2 The breeding tern populations all rely on habitats which are sensitive to nutrient nitrogen deposition (CL=8kgN/ha/yr), acid deposition (CL=0.626kEq/ha/yr), ammonia (CL=3µg/m^3) and NOx (CL=30µg/m^3).

All pollutants

7.8.3 The modelled contributions from the FBLP in combination are predicted to exceed 1% of the CL for nitrogen and acid deposition, and airborne NOx and ammonia (Ricardo, 2020). Five main areas of exceedance were identified, although not every pollutant shows an exceedance at each area. The appropriate assessment analysis has been undertaken using the nitrogen deposition screening results, as nitrogen deposition was modelled to have the largest area of impact. All other pollutants' exceedance areas fell within the nitrogen deposition areas of exceedance.

7.8.4 In all five locations the areas predicted to exceed the 1% screening threshold for nitrogen deposition are entirely comprised of road surfaces, open water and intertidal mudflats. All habitats identified also fall under the Mean High Water mark so would be regularly inundated with tidal water, preventing accumulation of any deposited pollutants.

Site specific impacts

7.8.5 The following site allocations were considered likely to significantly affect the Solent & Dorset Coast SPA as a result of construction noise/pollution in the absence of mitigation:

- Moraunt Drive, Portchester (ID:3032): construction noise;
- Warsash Maritime Academy (ID:3088): construction noise/pollution;
- North and South of Greenaway Lane, Warsash (ID:3126) construction pollution; and

- Southampton Road, Titchfield Common (ID:3128) construction pollution.

Table 7.7: Appropriate Assessment in view of conservation objectives: Solent & Dorset Coast SPA

Assessment of impacts on the Solent & Dorset Coast SPA conservation objectives
The extent and distribution of the habitats of the qualifying features None of the habitats of qualifying features will be adversely affected by predicted airborne pollutants or deposition resulting from traffic associated with the Local Plan. Their extent and distribution will therefore be unaffected by the Local Plan. Construction pollution and noise are unlikely to affect the extent and distribution of the foraging habitats of tern populations for which the site was designated.
The structure and function of the habitats of the qualifying features The structure and function of the habitats of qualifying features will not be adversely affected by predicted airborne pollutants or deposition resulting from traffic associated with the Local Plan. Construction pollution and noise are unlikely to affect the structure or function of tern foraging habitats.
The supporting processes on which the habitats of the qualifying features rely The processes supporting the habitats of qualifying features will not be adversely affected by predicted airborne pollutants or deposition resulting from traffic associated with the Local Plan. Construction pollution and noise are unlikely to affect the processes supporting tern foraging habitats.
The population of each of the qualifying features The abundance of qualifying features will not be affected by traffic associated with the Local Plan. A major pollution event during construction at two sites at Warsash and one at Titchfield Common could theoretically be so severe as to significantly reduce prey availability, though such extreme events are unusual and the geographic extent of impact would likely be limited. Taking account of incorporated mitigation measures (i.e. the requirement for Construction Environmental Management Plans), adverse effects on prey availability are unlikely to occur. Construction noise at these three sites, even if they were taking place simultaneously, is unlikely to resulting in a population scale impact on terns within the SPA.
The distribution of the qualifying features within the site The distribution of qualifying features within the site will not be affected by traffic associated with the Local Plan. Both construction noise and pollution could locally displace terns from hunting within otherwise suitable habitats in the SPA, although the impact is likely to be temporary and (at least in relation to noise) easily recoverable. Taking account of incorporated mitigation measures (i.e. the requirement for Construction Environmental Management Plans), the distribution of terns within the site is unlikely to be affected.

Conclusions of assessment against the Solent & Dorset Coast SPA conservation objectives

7.8.6 It is concluded that there will be no adverse effect on the integrity of the SPA as a consequence of predicted changes in air quality or site specific impacts arising from implementation of the Fareham Borough Local Plan, either alone or in combination with other plans and projects.

7.9 Solent & Southampton Water SPA/Ramsar

Atmospheric pollution

7.9.1 The source of atmospheric pollution impacts derives from the following policies (Appendix II):

- Housing Allocations HA1 to HA45, and FTC1 to FTC6
- E2 Faraday Business Park
- E3 Swordfish Business Park
- E4 Solent 2

7.9.2 The overwintering and on-passage populations of dark-bellied brent goose, teal, black-tailed godwit and ringed plover, and breeding gulls and terns, all rely on habitats which are sensitive to nutrient nitrogen deposition (minimum CL=8kgN/ha/yr) but only the terns are sensitive to acid deposition (CL=0.626kEq/ha/yr) according to APIS. All of the features have a CL of 3 µg/m^3 for ammonia and all features have a CL of 30 µg/m^3 for NOx.

Airborne ammonia

7.9.3 Ricardo (2020) states that the modelled FBLP in combination contribution of airborne NH_3 was added to background levels of ammonia across the site (obtained from APIS). The maximum total concentration of NH_3 for the FBLP in combination is 1.68 µg/m^3, which is 55.7% of the CL of 3 µg/m^3. Ricardo (2020) concludes that, on the basis of available evidence, including background ammonia concentrations, there are no adverse effects on this SPA/Ramsar site arising from increased ammonia associated with the FBLP in combination.

Airborne NOx

7.9.4 None of the vulnerable qualifying features are present in the locations where the total Predicted Environmental Concentration (i.e. FBLP in combination plus background levels) exceeds the Critical Level (Ricardo, 2020).

Nutrient nitrogen deposition

7.9.5 The maximum contribution of the FBLP in combination in areas near the River Test, River Itchen and Lee-on-the-Solent is <0.002 kgN/ha/yr, which is <0.025% of the lowest CL; these exceedances are considered to be so small as to be unlikely to result in any distinguishable effect on the qualifying features present in these locations (Ricardo, 2020).

7.9.6 Near the River Hamble M27 crossing and at Stubbington the maximum contribution of the FBLP in combination exceeds the 1% CL for breeding terns, however, breeding terns are unlikely to be found in either of these locations.

Acid deposition

7.9.7 The maximum contribution of the FBLP in areas near the River Test and River Itchen where the in combination contribution exceeds 1% of the CL is < 0.0001565 kEq/ha/yr, which is <0.025% of

the lowest CL; these exceedances are considered to be so small as to be unlikely to result in any distinguishable effect on the qualifying features present in these locations (Ricardo, 2020).

7.9.8 Near the River Hamble M27 crossing and at Curbridge Creek the maximum contribution of the FBLP in combination exceeds the 1% CL for breeding terns, however, breeding terns are unlikely to be found in either of these locations.

Strategic disturbance

7.9.9 The source of strategic disturbance impacts derives from the following policies (Appendix II):

- Housing Allocations HA1 to HA45, and FTC1 to FTC6

Water pollution

7.9.10 The source of water pollution impacts derives from the following policies (Appendix II):

- Housing Allocations HA1 to HA45, and FTC1 to FTC6

Site specific impacts

7.9.11 The following site allocations / SGA were considered likely to significantly affect the Solent and Southampton Water SPA/Ramsar as a result of habitat loss (within a functionally-linked Brent goose / wader site), displacement, construction noise/pollution/activity and shortened sight lines in the absence of mitigation:

- Hammond Industrial Park, Stubbington Lane (ID: 93): construction noise/activity within F13;
- Stubbington Lane, Hill Head (ID:1078): construction noise/activity within F13;
- Egmont Nursery, Warsash, Warsash (ID: 2890): construction noise;
- Warsash Maritime Academy (ID:3088): construction noise/pollution/activity and shortened sight lines;
- Faraday Business Park, Daedalus East (ID: 3113): displacement from F13;
- Swordfish Business Park, Daedalus West (ID: 3114): displacement from F13;
- North and South of Greenaway Lane, Warsash (ID:3126) construction pollution; and
- Southampton Road, Titchfield Common (ID:3128) construction pollution.

Table 7.8: Appropriate Assessment in view of conservation objectives: Solent & Southampton Water SPA/Ramsar

Assessment of impacts on the Solent & Southampton Water SPA/Ramsar conservation objectives
<u>The extent and distribution of the habitats of the qualifying features</u>
None of the habitats of qualifying features will be adversely affected by predicted airborne pollutants or deposition resulting from traffic associated with the Local Plan. Their extent and distribution will therefore be unaffected by the Local Plan.
The Local Plan is unlikely to alter the extent and distribution of the habitats of the Solent & Southampton Water SPA/Ramsar overwintering (dark-bellied Brent goose, black-tailed godwit, ringed plover and teal) bird populations as a result of increased disturbance.

Assessment of impacts on the Solent & Southampton Water SPA/Ramsar conservation objectives

Growth projections are not expected to result in impacts on the SAC via nutrient nitrogen pollution in the short term, however, Peel Common WWTW (serving Eastleigh, Fareham, Gosport, Test Valley and Winchester) is predicted to reach capacity by 2025 at which point a review of N permit will be required. Recently implemented (2014/2015) measures for improvements at Pennington WWTW, Peel Common WWTW, Eastney/Budds Farm WWTW and several in Southampton Water, will all reduce N inputs into the Solent. No adverse effects to the extent and distribution of qualifying natural habitats or habitats of qualifying species are likely in the short term, however, the capacity constraint at Peel Common means it is not possible to rule out the potential for adverse effects later in the plan period. The nitrogen budget for the Fareham Local Plan suggests that developments allocated in the plan will lead to a surplus of 2,536.99 kg/TN/yr over the plan period, exacerbating the macroalgal blooms which smother the intertidal mudflats (reducing the availability of epifaunal prey) and increase their vulnerability to erosion. However, policy NE4's requirement for all development which results in an increase in overnight accommodation to be nutrient neutral will adequately avoid the risk of adverse effects occurring; further information on how the nutrient budget was calculated and the schemes which are coming forward to enable nutrient neutral development to be delivered is presented in Appendix III.

Construction noise/activity, displacement and shortened sight lines are unlikely to physically affect the extent or distribution of the habitats within the SPA/Ramsar which used by overwintering wildfowl and waders and breeding gulls and terns.

A major pollution event during construction at two sites at Warsash and one at Titchfield Common could theoretically be so severe as to reduce the extent and distribution of the habitats of the qualifying features within the site, though such events are unusual and there is limited evidence for construction-related impacts in recent site condition assessments. Taking account of incorporated mitigation measures (i.e. the requirement for Construction Environmental Management Plans), adverse effects on the qualifying features are unlikely to occur.

The structure and function of the habitats of the qualifying features

The structure and function of the habitats of qualifying features will not be adversely affected by predicted airborne pollutants or deposition resulting from traffic associated with the Local Plan.

The plan has the potential to alter the structure and function of the habitats of the Solent & Southampton Water SPA/Ramsar overwintering bird populations. The impact could be indirect and permanent or reversible as a result of increased footfall within the site, leading to trampling of vegetation, soil compaction and erosion; or be direct, intermittent and reversible due to increased human/dog activity leading to displacement of the birds from otherwise suitable feeding or roosting habitats. The impact is very likely act in combination with other plans and projects. The magnitude of the potential impact is uncertain but potentially large (a minimum of 8,389 dwellings within 5.6km of the SPA/Ramsar), especially in combination, and is likely to continue year-round. The risk of adverse effects on integrity is high. However, counteracting measures were devised in cooperation with Natural England and other local planning authority members of the Solent Recreation Mitigation Partnership, and have been incorporated into the plan via proposed policy NE3, and are considered likely to effectively avoid and mitigate the impact.

No adverse effects on the structure and function of qualifying natural habitats resulting from excess nitrogen pollution in the marine environment are likely in the short term, however, in the absence of mitigation the capacity constraint at Peel Common means it is not possible to rule out the potential for adverse effects later in the plan period. Incorporated mitigation measures are considered adequate to avoid the risk of adverse effects occurring.

The extent of impacts from construction noise/activity, displacement and shortened sight lines, and their effects on overwintering wildfowl and waders and breeding gulls and terns, are likely to be highly

Assessment of impacts on the Solent & Southampton Water SPA/Ramsar conservation objectives
site specific and dependent on detailed design information which is not currently available. However, there is a risk of functional loss whereby otherwise suitable habitat is rendered unusable by qualifying species as they avoid increases in perceived predation risk, resulting in reduced breeding success and winter survival rates. Incorporated mitigation measures, including Construction Environmental Management Plans and sensitively designed development in relation to scale, form and massing, are likely to adequately avoid these risks. The structure and function of the habitats of the qualifying features could be indirectly affected by a major pollution event during construction at two sites at Warsash and one at Titchfield Common. However, taking account of incorporated mitigation measures, adverse effects are unlikely to occur.
The supporting processes on which the habitats of the qualifying features rely The processes supporting the habitats of qualifying features will not be adversely affected by predicted airborne pollutants or deposition resulting from traffic associated with the Local Plan. The plan is unlikely to significantly undermine the supporting processes on which the habitats of the Solent & Southampton Water SPA/Ramsar overwintering bird populations rely, although minor indirect impacts are possible through trampling, soil compaction and erosion. The supporting processes on which qualifying habitats/species rely is unlikely to be adversely affected by excess nitrogen pollution in the marine environment in the short term, however, the capacity constraint at Peel Common means it is not possible to rule out the potential for adverse effects later in the plan period. Incorporated mitigation measures are considered adequate to avoid the risk of adverse effects occurring. Construction noise/activity, displacement and shortened sight lines are unlikely to alter the processes supporting the habitats of qualifying species. A major pollution event during construction at two sites at Warsash and one at Titchfield Common could alter water chemistry, though there is limited evidence for construction-related impacts in recent site condition assessments, and such an effect is likely to be localised and temporary. Taking account of incorporated mitigation measures (i.e. the requirement for Construction Environmental Management Plans), adverse effects on the habitats of the qualifying features are unlikely to occur.
The population of each of the qualifying features ***The distribution of the qualifying features within the site*** The abundance of qualifying features and their distribution within the site will not be affected by traffic associated with the Local Plan. The Solent & Southampton Water SPA/Ramsar overwintering dark-bellied Brent goose, black-tailed godwit, ringed plover and teal populations could potentially be reduced via increased energetic expenditure and starvation risk, leading to a fall in winter survival rates as a result of increased disturbance. The birds' distribution within the site is also likely to be altered as birds are displaced from otherwise suitable habitats in response to increased disturbance. The magnitude of the potential impact is uncertain but likely to be significant. The impact is very likely act in combination with other plans and projects. However, counteracting measures have been incorporated into the plan and are considered likely to effectively avoid and mitigate the impact. The populations and distribution of qualifying species are unlikely to be significantly affected by excess nitrogen pollution in the marine environment in the short term, however, the capacity constraint at Peel Common means it is not possible to rule out the potential for indirect adverse effects later in the plan period. Incorporated mitigation measures are considered adequate to avoid the risk of adverse effects occurring. Construction noise/activity, displacement and shortened sight lines are, in combination, likely to alter

Assessment of impacts on the Solent & Southampton Water SPA/Ramsar conservation objectives
the distribution of overwintering wildfowl and waders and breeding gulls and terns with the site and limit their ability to feed or rest sufficiently, and risk reducing the overall population of each species with the site. But, taking account of incorporated mitigation measures, adverse effects are unlikely to occur. The abundance of qualifying features is unlikely to be significantly affected by a major pollution event at two sites at Warsash and one at Titchfield Common, given the likely localised nature of such an event and the extent of habitat available overall, however their distribution within the site could be constrained at least in short term. Taking account of incorporated mitigation measures, adverse effects are unlikely to occur.

Conclusions of assessment against the Solent & Southampton Water SPA/Ramsar conservation objectives

7.9.12 It is concluded that there will be no adverse effect on the integrity of the SPA/Ramsar as a consequence of predicted changes in air quality, strategic disturbance, water pollution or site specific impacts arising from implementation of the Fareham Borough Local Plan, either alone or in combination with other plans and projects.

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8 Determining Adverse Effects on Integrity

8.1 Introduction

8.1.1 Using the information presented in Chapters 6 and 7, the following sections consider whether, in light of the mitigation strategy outlined in Chapter 8, adverse effects on the integrity of European sites can be ruled out.

8.1.2 English Nature (2004; now Natural England) has produced guidance on determining site integrity which includes a 'simple, pragmatic checklist' for assessing likely effects on integrity. This requires the assessor to pose a series of five questions to consider whether the Appropriate Assessment has shown:

- That the area of Annex 1 habitats (or composite features) will not be reduced?
- That there will be no direct effect on the population of the species for which the site was designated or classified?
- That there will be no indirect effects on the populations of species for which the site was designated due to loss or degradation of their habitat (quantity/quality)?
- That there will be no changes to the composition of the habitats for which the site was designated (e.g. reduction in species structure, abundance or diversity that comprises the habitat over time)?
- 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 designated or classified?

8.1.3 The guidance suggests that if the answer to all of these questions is 'Yes' then it is reasonable to conclude that there is not an adverse effect on integrity. If the answer is 'No' to one or more of the questions then further site-specific factors need to be considered in order to reach a decision. Such factors include:

- 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.

8.1.4 This two-step process is applied to determine whether there will be adverse effects on the European sites as a result of the Fareham Borough Local Plan.

8.2 River Itchen SAC

Step-one tests

Has the Appropriate Assessment shown:	Y/N
That the area of annex I habitats (or habitats of qualifying features) will not be reduced? The appropriate assessment has shown that there will be no reduction in the area of annex I habitats or habitats of annex II species as a result of atmospheric pollution.	**Y**
That there will be no direct effect on the population of the species for which the site was designated or classified? The appropriate assessment has shown that there will be no direct effect on the population annex II species as a result of atmospheric pollution.	**Y**
That there will be no indirect effects on the populations of species for which the site was designated or classified due to loss or degradation of their habitat (quantity/quality)? The appropriate assessment has shown that there will be no indirect effect on the population annex II species due to loss or degradation of their habitat as a result of atmospheric pollution.	**Y**
That there will be no changes to the composition of the habitats for which the site was designated (eg reduction in species structure, abundance or diversity that comprises the habitat over time)? The appropriate assessment has shown that there will be no changes to the composition of annex I habitats as a result of atmospheric pollution.	**Y**
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 designated or classified? The appropriate assessment has shown that there will be no degradation of the physical, chemical or biological processes supporting annex I habitats or annex II species as a result of atmospheric pollution.	**Y**

8.2.1 It can be concluded that there will be no adverse effects on the integrity of the River Itchen SAC, either alone or in combination with other plans and projects. The Fareham Borough Local Plan can be considered compliant with the Habitats Regulations in relation to this site.

8.3 Solent Maritime SAC

Step-one tests

Has the Appropriate Assessment shown:	Y/N
That the area of annex I habitats (or habitats of qualifying features) will not be reduced? The appropriate assessment has shown that there will be no reduction in the area of annex I habitats or habitats of annex II species as a result of atmospheric pollution, water pollution or site-specific impacts.	**Y**
That there will be no direct effect on the population of the species for which the site was designated or classified? The appropriate assessment has shown that there will be no direct effect on the population annex II species as a result of atmospheric pollution, water pollution or site-specific impacts.	**Y**
That there will be no indirect effects on the populations of species for which the site was	**Y**

Has the Appropriate Assessment shown:	Y/N
designated or classified due to loss or degradation of their habitat (quantity/quality)? The appropriate assessment has shown that there will be no indirect effect on the population annex II species due to loss or degradation of their habitat as a result of atmospheric pollution, water pollution or site-specific impacts.	
That there will be no changes to the composition of the habitats for which the site was designated (eg reduction in species structure, abundance or diversity that comprises the habitat over time)? The appropriate assessment has shown that there will be no changes to the composition of annex I habitats as a result of atmospheric pollution, water pollution or site-specific impacts.	**Y**
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 designated or classified? The appropriate assessment has shown that there will be no degradation of the physical, chemical or biological processes supporting annex I habitats or annex II species as a result of atmospheric pollution, water pollution or site-specific impacts.	**Y**

8.3.1 It can be concluded that there will be no adverse effects on the integrity of the Solent Maritime SAC, either alone or in combination with other plans and projects. The Fareham Borough Local Plan can be considered compliant with the Habitats Regulations in relation to this site.

8.4 The New Forest SAC/Ramsar

Step-one tests

Has the Appropriate Assessment shown:	Y/N
That the area of annex I habitats (or habitats of qualifying features) will not be reduced? The appropriate assessment has shown that there will be no reduction in the area of annex I habitats or habitats of annex II species as a result of atmospheric pollution.	**Y**
That there will be no direct effect on the population of the species for which the site was designated or classified? The appropriate assessment has shown that there will be no direct effect on the population annex II species as a result of atmospheric pollution.	**Y**
That there will be no indirect effects on the populations of species for which the site was designated or classified due to loss or degradation of their habitat (quantity/quality)? The appropriate assessment has shown that there will be no indirect effect on the population annex II species due to loss or degradation of their habitat as a result of atmospheric pollution.	**Y**
That there will be no changes to the composition of the habitats for which the site was designated (eg reduction in species structure, abundance or diversity that comprises the habitat over time)? The appropriate assessment has shown that there will be no changes to the composition of annex I habitats as a result of atmospheric pollution.	**Y**
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 designated or classified? The appropriate assessment has shown that there will be no degradation of the physical,	**Y**

Has the Appropriate Assessment shown:	Y/N
chemical or biological processes supporting annex I habitats or annex II species as a result of atmospheric pollution.	

8.4.1 It can be concluded that there will be no adverse effects on the integrity of the New Forest SAC/Ramsar, either alone or in combination with other plans and projects. The Fareham Borough Local Plan can be considered compliant with the Habitats Regulations in relation to these sites.

8.5 The New Forest SPA

Step-one tests

Has the Appropriate Assessment shown:	Y/N
That the area of annex I habitats (or habitats of qualifying features) will not be reduced? The appropriate assessment has shown that there will be no reduction in the area of habitats of qualifying features as a result of atmospheric pollution.	**Y**
That there will be no direct effect on the population of the species for which the site was designated or classified? The appropriate assessment has shown that there will be no direct effect on the populations of qualifying features as a result of atmospheric pollution.	**Y**
That there will be no indirect effects on the populations of species for which the site was designated or classified due to loss or degradation of their habitat (quantity/quality)? The appropriate assessment has shown that there will be no indirect effect on the population qualifying features as a result of atmospheric pollution.	**Y**
That there will be no changes to the composition of the habitats for which the site was designated (eg reduction in species structure, abundance or diversity that comprises the habitat over time)? The New Forest SPA does not contain designated habitats, its qualifying features instead comprise its breeding and non-breeding bird populations.	**Y**
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 designated or classified? The appropriate assessment has shown that there will be no degradation of the physical, chemical or biological processes supporting the qualifying features as a result of atmospheric pollution.	**Y**

8.5.1 It can be concluded that there will be no adverse effects on the integrity of the New Forest SPA, either alone or in combination with other plans and projects. The Fareham Borough Local Plan can be considered compliant with the Habitats Regulations in relation to this site.

8.6 Chichester & Langstone Harbours SPA/Ramsar

Step-one tests

Has the Appropriate Assessment shown:	Y/N
That the area of annex I habitats (or habitats of qualifying features) will not be reduced? The appropriate assessment has shown that there will be no reduction in the area of habitats of qualifying features as a result of disturbance.	**Y**
That there will be no direct effect on the population of the species for which the site was designated or classified? The appropriate assessment has shown that there will be no direct effect on the populations of qualifying features as a result of disturbance.	**Y**
That there will be no indirect effects on the populations of species for which the site was designated or classified due to loss or degradation of their habitat (quantity/quality)? The appropriate assessment has shown that there will be no indirect effect on the population qualifying features as a result of disturbance.	**Y**
That there will be no changes to the composition of the habitats for which the site was designated (eg reduction in species structure, abundance or diversity that comprises the habitat over time)? The New Forest SPA does not contain designated habitats, its qualifying features instead comprise its breeding and non-breeding bird populations.	**Y**
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 designated or classified? The appropriate assessment has shown that there will be no degradation of the physical, chemical or biological processes supporting the qualifying features as a result of disturbance.	**Y**

8.6.1 It can be concluded that there will be no adverse effects on the integrity of the Chichester and Langstone Harbours SPA/Ramsar, either alone or in combination with other plans and projects. The Fareham Borough Local Plan can be considered compliant with the Habitats Regulations in relation to these sites.

8.7 Portsmouth Harbour SPA/Ramsar

Step-one tests

Has the Appropriate Assessment shown:	Y/N
That the area of annex I habitats (or habitats of qualifying features) will not be reduced? The appropriate assessment has shown that there will be no reduction in the area of habitats of qualifying features as a result of atmospheric pollution, strategic disturbance or site-specific impacts.	**Y**
That there will be no direct effect on the population of the species for which the site was designated or classified? The appropriate assessment has shown that there will be no direct effect on the populations of qualifying features as a result of atmospheric pollution, strategic disturbance or site-specific impacts.	**Y**
That there will be no indirect effects on the populations of species for which the site was	**Y**

Has the Appropriate Assessment shown:	Y/N
designated or classified due to loss or degradation of their habitat (quantity/quality)? The appropriate assessment has shown that there will be no indirect effect on the population qualifying features as a result of atmospheric pollution, strategic disturbance or site-specific impacts.	
That there will be no changes to the composition of the habitats for which the site was designated (eg reduction in species structure, abundance or diversity that comprises the habitat over time)? The New Forest SPA does not contain designated habitats, its qualifying features instead comprise its breeding and non-breeding bird populations.	**Y**
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 designated or classified? The appropriate assessment has shown that there will be no degradation of the physical, chemical or biological processes supporting the qualifying features as a result of atmospheric pollution, strategic disturbance or site-specific impacts.	**Y**

8.7.1 It can be concluded that there will be no adverse effects on the integrity of the Portsmouth Harbour SPA/Ramsar, either alone or in combination with other plans and projects. The Fareham Borough Local Plan can be considered compliant with the Habitats Regulations in relation to these sites.

8.8 Solent & Dorset Coast SPA

Step-one tests

Has the Appropriate Assessment shown:	Y/N
That the area of annex I habitats (or habitats of qualifying features) will not be reduced? The appropriate assessment has shown that there will be no reduction in the area of habitats of qualifying features as a result of atmospheric pollution or site-specific impacts.	**Y**
That there will be no direct effect on the population of the species for which the site was designated or classified? The appropriate assessment has shown that there will be no direct effect on the populations of qualifying features as a result of atmospheric pollution or site-specific impacts.	**Y**
That there will be no indirect effects on the populations of species for which the site was designated or classified due to loss or degradation of their habitat (quantity/quality)? The appropriate assessment has shown that there will be no indirect effect on the population qualifying features as a result of atmospheric pollution or site-specific impacts.	**Y**
That there will be no changes to the composition of the habitats for which the site was designated (eg reduction in species structure, abundance or diversity that comprises the habitat over time)? The New Forest SPA does not contain designated habitats, its qualifying features instead comprise its breeding and non-breeding bird populations.	**Y**
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 designated or classified? The appropriate assessment has shown that there will be no degradation of the physical,	**Y**

Has the Appropriate Assessment shown:	Y/N
chemical or biological processes supporting the qualifying features as a result of atmospheric pollution or site-specific impacts.	

8.8.1 It can be concluded that there will be no adverse effects on the integrity of the Solent and Dorset Coast SPA, either alone or in combination with other plans and projects. The Fareham Borough Local Plan can be considered compliant with the Habitats Regulations in relation to this site.

8.9 Solent & Southampton Water SPA/Ramsar

Step-one tests

Has the Appropriate Assessment shown:	Y/N
That the area of annex I habitats (or habitats of qualifying features) will not be reduced? The appropriate assessment has shown that there will be no reduction in the area of habitats of qualifying features as a result of atmospheric pollution, strategic disturbance, water pollution or site-specific impacts.	**Y**
That there will be no direct effect on the population of the species for which the site was designated or classified? The appropriate assessment has shown that there will be no direct effect on the populations of qualifying features as a result of atmospheric pollution, strategic disturbance, water pollution or site-specific impacts.	**Y**
That there will be no indirect effects on the populations of species for which the site was designated or classified due to loss or degradation of their habitat (quantity/quality)? The appropriate assessment has shown that there will be no indirect effect on the population qualifying features as a result of atmospheric pollution, strategic disturbance, water pollution or site-specific impacts.	**Y**
That there will be no changes to the composition of the habitats for which the site was designated (eg reduction in species structure, abundance or diversity that comprises the habitat over time)? The New Forest SPA does not contain designated habitats, its qualifying features instead comprise its breeding and non-breeding bird populations.	**Y**
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 designated or classified? The appropriate assessment has shown that there will be no degradation of the physical, chemical or biological processes supporting the qualifying features as a result of atmospheric pollution, strategic disturbance, water pollution or site-specific impacts.	**Y**

8.9.1 It can be concluded that there will be no adverse effects on the integrity of the Solent and Southampton Water SPA/Ramsar, either alone or in combination with other plans and projects. The Fareham Borough Local Plan can be considered compliant with the Habitats Regulations in relation to these sites.

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9 Summary and Consultation Arrangements

9.1 Summary

9.1.1 This document sets out a Habitats Regulations Assessment for the Fareham Borough Local Plan 2037. The report accompanies the Publication Plan and forms part of the evidence base upon which it is based.

9.2 Scope of the Assessment

9.2.1 Acknowledging that the Local Plan is not directly connected with or necessary to management of the sites for nature conservation, the HRA considers the following European sites for likely significant or adverse effects on integrity:

- Butser Hill SAC
- Solent & Isle of Wight Lagoons SAC
- The New Forest SAC
- Portsmouth Harbour SPA
- Solent & Southampton Water SPA
- Chichester & Langstone Harbours Ramsar
- Solent & Southampton Water Ramsar
- River Itchen SAC
- Solent Maritime SAC
- Chichester & Langstone Harbours SPA
- Solent & Dorset Coast SPA
- The New Forest SPA
- Portsmouth Harbour Ramsar
- The New Forest Ramsar

9.3 Summary of Findings

9.3.1 In summary, the assessment of the Fareham Local Plan finds that:

- No likely significant effects were identified in relation to Butser Hill SAC, Emer Bog SAC, Solent and Isle of Wight Lagoons SAC, either alone or in combination with other plans and projects.
- No likely significant effects through atmospheric pollution were identified for Chichester and Langstone Harbours SPA/Ramsar, either alone or in combination with other plans and projects. There will be no adverse effect on the integrity of River Itchen SAC, Solent Maritime SAC, the New Forest SAC/SPA/Ramsar, Portsmouth Harbour SPA/Ramsar, Solent and Dorset Coast SPA or Solent and Southampton Water SPA/Ramsar as a result of atmospheric pollution, either alone or in combination with other plans and projects.
- No likely significant effects through coastal squeeze were identified for Solent Maritime SAC, Portsmouth Harbour SPA/Ramsar, Solent and Dorset Coast SPA or Solent and Southampton Water SPA/Ramsar, either alone or in combination with other plans and projects.

- No likely significant effects through strategic disturbance were identified for River Itchen SAC, Solent Maritime SAC, the New Forest SAC/SPA/Ramsar or Solent and Dorset Coast SPA, either alone or in combination with other plans and projects. There will be no adverse effect on the integrity of Chichester and Langstone Harbours SPA/Ramsar, Portsmouth Harbour SPA/Ramsar or Solent and Southampton Water SPA/Ramsar as a result of strategic disturbance, either alone or in combination with other plans and projects.
- No likely significant effects through water abstraction were identified for River Itchen SAC, Solent Maritime SAC, Chichester and Langstone Harbours SPA/Ramsar, Portsmouth Harbour SPA/Ramsar and Solent and Southampton Water SPA/Ramsar, either alone or in combination with other plans and projects.
- No likely significant effects through water pollution were identified for River Itchen SAC, Chichester and Langstone Harbours SPA/Ramsar, Portsmouth Harbour SPA/Ramsar or Solent and Dorset Coast SPA, either alone or in combination with other plans and projects. There will be no adverse effect on the integrity of Solent Maritime SAC or Solent and Southampton Water SPA/Ramsar as a result of water pollution, either alone or in combination with other plans and projects.
- No likely significant effects through site specific impacts were identified for River Itchen SAC, the New Forest SAC/SPA/Ramsar or Chichester and Langstone Harbours SPA/Ramsar, either alone or in combination with other plans and projects. There will be no adverse effect on the integrity of Solent Maritime SAC, Portsmouth Harbour SPA/Ramsar, Solent and Dorset Coast SPA or Solent and Southampton Water SPA/Ramsar as a result of site specific impacts, either alone or in combination with other plans and projects.

9.4 Conclusions

9.4.1 The Fareham Borough Local Plan can be considered compliant with the Habitats Regulations with regards to: Butser Hill SAC, Emer Bog SAC, Solent and Isle of Wight Lagoons SAC, New Forest SAC/SPA/Ramsar; River Itchen SAC; Solent Maritime SAC; Chichester and Langstone Harbours SPA/Ramsar; Portsmouth Harbour SPA/Ramsar; Solent & Dorset Coast SPA; and Solent & Southampton Water SPA/Ramsar.

9.5 Consultation Arrangements

9.5.1 The HRA Report is being made available for public comment as part of a period of representations on the Publication Plan in autumn 2020 and can be viewed at:

http://www.fareham.gov.uk/planning/farehamlocalplanreview.aspx
Planning Strategy **Fareham Borough Council** **Civic Offices, Civic Way, Fareham, Hampshire PO16 7AZ**

9.5.2 Representations should be sent to:

Planning Strategy
Fareham Borough Council
Civic Offices, Civic Way, Fareham, Hampshire PO16 7AZ
planningpolicy@fareham.gov.uk

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Appendix I: SPA Qualifying Species Counts

Please see insert.

1 Special Protection Area Qualifying Species Counts

1.1.1 This appendix sets out the qualifying species counts for each of the Special Protection Areas (SPAs) considered within the HRA to supplement Table 3.2 and Chapter 4 of the main HRA report. The information included in this appendix is taken from the Citation document for each SPA, available on the Natural England European sites website[1]. The Citation document represents the legal basis for the designation of a site. Where the information in the Citation document is incomplete or unavailable, figures are sourced from the relevant JNCC Nature 2000 data form as indicated by the information source provided within Table 1.

Table 1: SPA Qualifying Features at Citation

SPA Name	Qualifying Features and Counts
Chichester & Langstone Harbours	Wild Birds Directive Article 4.1 Qualification: Annex I Species - Common tern *Sterna hirundo*, 33 pairs representing 0.3% of the GB breeding population (5 year mean 1992-1996); - Little Tern *Sterna albifrons*, 100 pairs representing 4.2% of the GB breeding population (5 year mean 1992-1996); and - Sandwich Tern *Sterna sandvicensis*, 31 pairs representing 0.2% of the GB breeding population (5 year mean 1993-1997). Wild Birds Directive Article 4.2 Qualification: Migratory Species not listed in Annex I - Bar-tailed godwit *Limosa lapponica*, 1,692 individuals representing 3.2% of the GB population (5 year peak mean 1991/92-1995/96); - Dark-bellied brent goose *Branta bernicla bernicla*, 17,119 individuals representing 5.7% of the Western Siberia/Western Europe population (5 year peak mean 1991/92-1995/96); - Dunlin *Calidris alpina alpina*, 44,294 individuals representing 3.2% of the Northern Siberia/Europe/Western Africa population (5 year peak mean 1991/92-1995/96) ; - Eurasian curlew *Numenius arquata*, 1,861 individuals representing 1.6% of the population in Great Britain (5 year peak mean 1991/92-1995/96);

[1] http://publications.naturalengland.org.uk/category/6528471664689152

SPA Name	Qualifying Features and Counts
	- Grey plover *Pluvialis squatarola*, 3,825 individuals representing 2.3% of the Eastern Atlantic wintering population (5 year peak mean 1991/92-1995/96); - Pintail *Anas acuta*, 330 individuals representing 1.2% of the population in Great Britain (5 year peak mean 1991/92-1995/96); - Red-breasted merganser *(Mergus serrator)*, 297 individuals representing 3% of the population in Great Britain (5 year peak mean 1991/92-1995/96) - Redshank *Tringa totanus*, 1,788 individuals representing 1% of the Eastern Atlantic - wintering population (5 year peak mean 1991/92-1995/96); - Ringed plover *Charadrius hiaticula*, 846 individuals representing 3% of the population in Great Britain (5 year peak mean 1991/92-1995/96); - Sanderling *Calidris alba*, 236 individuals representing 0.2% of the Eastern Atlantic/Western & Southern Africa - wintering population (5 year peak mean 1991/92-1995/96); - Shelduck *Tadorna tadorna*, 2,410 individuals representing 3.3% of the population in Great Britain (5 year peak mean 1991/92-1995/96); - Shoveler *Anas clypeata*, 100 individuals representing 1% of the population in Great Britain (5 year peak mean 1991/92-1995/96); - Teal *Anas crecca*, 1,824 individuals representing 0.5% of the North-western Europe population (5 year peak mean 1991/92-1995/96); - Turnstone *Arenaria interpres*, 430 individuals representing 0.7% of the population in Great Britain (5 year peak mean 1991/92-1995/96); and - Wigeon *Anas penelope*, 2,055 individuals representing 0.7% of the population in Great Britain (5 year peak mean 1991/92-1995-96). Waterbird Assemblage An internationally important assemblage of birds, over winter the area regularly supports 93,230 waterfowl (5 year peak mean 1991/92-1995/96). Info Source: JNCC Natura 2000 Standard Data Form Chichester & Langstone Harbours SPA (https://jncc.gov.uk/jncc-assets/SPA-N2K/UK9011011.pdf) (Accessed 11/03/20)
Portsmouth Harbour	Wild Birds Directive Article 4.2 Qualification: Migratory Species not listed in Annex I - Dark-bellied brent goose *Branta bernicla bernicla*, 2,290 individuals representing 2.5% of the British wintering population (5 year

SPA Name	Qualifying Features and Counts
	peak mean 1986/87 to 1990/91); - Red-breasted merganser *Mergus serrator*, 100 individuals representing 1% of the British wintering population (5 year peak mean 1986/87 to 1990/91); - Black-tailed godwit *Limosa limosa islandica*, 70 individuals representing over 1% of the British wintering population (5 year peak mean 1986/87 to 1990/91); and - Dunlin *Calidris alpina*, 8,010 individuals representing over 1% of the British wintering population (5 year peak mean 1986/87 to 1990/91). Info Source: Natural England Citation Portsmouth Harbour SPA (Uploaded 20/09/2014) (http://publications.naturalengland.org.uk/publication/4857883850178560?category=6528471664689152)
Solent & Dorset Coast	Wild Birds Directive Article 4.1 Qualification: Annex II Species - Sandwich Tern *Sterna sandvicensis* (breeding); - Common Tern *Sterna hirundo* (breeding); and - Little Tern *Sterna albifrons* (breeding). Species counts not yet published for this newly designated SPA.
Solent & Southampton Water	Wild Birds Directive Article 4.1 Qualification: Annex I Species: - Mediterranean gull *Larus melanocephalus*, 2 pairs representing at 8.2-13.9% of the breeding population in Great Britain (5 year peak mean 1994-1998); - Sandwich tern *Sterna sandvicensis*, 231 pairs representing at least 1.7% of the breeding population in Great Britain (5 year peak mean 1993-1997) ; - Common tern *Sterna hirundo*, 267 pairs representing at least 2.2% of the breeding population in Great Britain (5 year peak mean 1993-1997); - Little tern *Sterna albifrons*, 49 pairs representing at least 2.0% of the breeding population in Great Britain (5 year peak mean 1993-1997); and - Roseate tern *Sterna dougallii*, 2 pairs representing at least 3.1% of the breeding population in Great Britain (5 year peak mean

SPA Name	Qualifying Features and Counts
	1993-1997). Wild Birds Directive Article 4.2 Qualification: Migratory Species not listed in Annex I: - Dark-bellied brent goose *Branta bernicla bernicla*, 7,506 individuals representing at least 2.5% of the wintering Western Siberia/Western Europe population (5 year peak mean 1992/3-1996/7); - Eurasian teal *Anas crecca*, 4,400 individuals representing at least 1.1% of the wintering Northwestern Europe population (5 year peak mean 1992/3-1996/7); - Ringed plover *Charadrius hiaticula*, 552 individuals representing at least 1.1% of the wintering Europe/Northern Africa - wintering population (5 year peak mean 1992/3-1996/7); and - Black-tailed godwit *Limosa limosa islandica*, 1,125 individuals representing at least 1.6% of the wintering Iceland - breeding population (5 year peak mean 1992/3-1996/7). Internationally Important Assemblage - Over winter, the area regularly supports 51,361 individual waterfowl (5 year peak mean 1992/93-1996/97). Info Source: Natural England Citation Solent & Southampton Water SPA (Uploaded 20/09/2014) (http://publications.naturalengland.org.uk/publication/6567218288525312?category=6528471664689152)
The New Forest	Wild Birds Directive Article 4.1 Qualification: Annex I Species - Nightjar *Caprimulgus europaeus*, 300 pairs representing at least 15% of the GB breeding population (no count period specified); - Woodlark *Lullula arborea*, 51-54 pairs representing about 24% of the GB breeding population (no count period specified); - Dartford Warbler *Sylvia undata*, 454 pairs representing 75% of the GB breeding population (no count period specified); - Honey Buzzard *Pernis apivorus*, 2 pairs representing 7% of the breeding population in Great Britain (no count period specified); and - Hen Harrier *Circus cyaneus*, 15 individuals representing at least 2% of the wintering population in Great Britain (no count period specified). - Notable

SPA Name	Qualifying Features and Counts
	Wild Birds Directive Article 4.2 Qualification: Migratory Species not listed in Annex I - Hobby *Falco Subbuteo*, in summer up to 25 pairs representing 3% of the GB breeding population at the time of SPA classification; and - Wood Warbler *Phylloscopus sibilatrix*, in excess of 350 pairs representing at least 3% of the GB breeding population at the time of SPA classification. - Notable Assemblage In addition to its importance for the individual species listed above, the site is of exceptional scientific interest for its assemblage of lowland heathland breeding birds. These include nightjar, woodlark, Dartford warbler and stonechat. Info Source: Natural England Citation The New Forest SPA (Uploaded 17/09/2014) (http://publications.naturalengland.org.uk/publication/5816333400801280?category=6528471664689152)

Appendix II: Screening Assessment

Please see insert.

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Fareham Borough Local Plan Publication Plan Site Allocations and Policies			Butser Hill	Emer Bog	River Itchen	Solent & Isle of Wight Lagoons	Solent Maritime	The New Forest	Chichester & Langstone Harbours	Portsmouth Harbour	Solent & Dorset Coast	Solent & Southampton Water	The New Forest	Chichester & Langstone Harbours	Portsmouth Harbour	Solent & Southampton Water	The New Forest
			SAC						SPA					Ramsar			
ID	Site Name	Likely Significant Effects															
93	Hammond Industrial Estate	Atmospheric pollution; Disturbance; Water pollution; Construction Noise; Construction and Operational Activity	E	E	J	E	J	J	J	J	J	J	J	J	J	J	J
124	Solent 2, Solent Business Park, Rookery Avenue, Whiteley	Atmospheric pollution	E	E	J	E	J	J	E	J	J	J	J	E	J	J	J
203	3-33 West Street, Porchester	Atmospheric pollution; Disturbance; Water pollution	E	E	J	E	J	J	J	J	J	J	J	J	J	J	J
211	Fareham Station East	Atmospheric pollution; Disturbance; Water pollution	E	E	J	E	J	J	J	J	J	J	J	J	J	J	J
212	Fareham Station West	Atmospheric pollution; Disturbance; Water pollution	E	E	J	E	J	J	J	J	J	J	J	J	J	J	J
1002	Corner of Station Rd, Porchester	Atmospheric pollution; Disturbance; Water pollution	E	E	J	E	J	J	J	J	J	J	J	J	J	J	J
1007	Heath Road, Locks Heath	Atmospheric pollution; Disturbance; Water pollution	E	E	J	E	J	J	J	J	J	J	J	J	J	J	J
1058	Wynton Way, Fareham	Atmospheric pollution; Disturbance; Water pollution	E	E	J	E	J	J	J	J	J	J	J	J	J	J	J
1070	Land East of Church Road	Atmospheric pollution; Disturbance; Water pollution	E	E	J	E	J	J	J	J	J	J	J	J	J	J	J
1072	399-409 Hunts Pond Road	Atmospheric pollution; Disturbance; Water pollution	E	E	J	E	J	J	J	J	J	J	J	J	J	J	J
1075	33 Lodge Rd	Atmospheric pollution; Disturbance; Water pollution	E	E	J	E	J	J	J	J	J	J	J	J	J	J	J
1076	335-357 Gosport Road, Fareham	Atmospheric pollution; Disturbance; Water pollution	E	E	J	E	J	J	J	J	J	J	J	J	J	J	J
1078	Stubbington Lane, Hill Head	Atmospheric pollution; Disturbance; Water pollution; Construction Noise; Construction and Operational Activity	E	E	J	E	J	J	J	J	J	J	J	J	J	J	J
1168	Rookery Avenue	Atmospheric pollution; Disturbance; Water pollution	E	E	J	E	J	J	J	J	J	J	J	J	J	J	J
1325	Crofton Conservatories, West Street, Fareham	Atmospheric pollution; Disturbance; Water pollution	E	E	J	E	J	J	J	J	J	J	J	J	J	J	J
1360	Beacon Bottom West, Park Gate	Atmospheric pollution; Disturbance; Water pollution	E	E	J	E	J	J	J	J	J	J	J	J	J	J	J
1425	Market Quay, Fareham	Atmospheric pollution; Disturbance; Water pollution	E	E	J	E	J	J	J	J	J	J	J	J	J	J	J

Fareham Borough Local Plan Publication Plan Site Allocations and Policies			Butser Hill	Emer Bog	River Itchen	Solent & Isle of Wight Lagoons	Solent Maritime	The New Forest	Chichester & Langstone Harbours	Portsmouth Harbour	Solent & Dorset Coast	Solent & Southampton Water	The New Forest	Chichester & Langstone Harbours	Portsmouth Harbour	Solent & Southampton Water	The New Forest
			SAC						SPA					Ramsar			
2843	Land South of Cams Alders	Atmospheric pollution; Disturbance; Water pollution	E	E	J	E	J	J	J	J	J	J	J	J	J	J	J
2890	Egmont Nurseries	Atmospheric pollution; Disturbance; Water pollution; Construction Noise	E	E	J	E	J	J	J	J	J	J	J	J	J	J	J
3018	Land East of Bye Road	Atmospheric pollution; Disturbance; Water pollution	E	E	J	E	J	J	J	J	J	J	J	J	J	J	J
3023	69 Botley Road, Park Gate	Atmospheric pollution; Disturbance; Water pollution	E	E	J	E	J	J	J	J	J	J	J	J	J	J	J
3030	Downend Road East	Atmospheric pollution; Disturbance; Water pollution	E	E	J	E	J	J	J	J	J	J	J	J	J	J	J
3032	Moraunt Drive, Portchester	Atmospheric pollution; Disturbance; Water pollution; Construction Noise; Construction and Operational Activity; shortened sight Lines	E	E	J	E	J	J	J	J	J	J	J	J	J	J	J
3036	Land west of Sovereign Crescent, Locks Heath	Atmospheric pollution; Disturbance; Water pollution	E	E	J	E	J	J	J	J	J	J	J	J	J	J	J
3040	Land West of Northfield Park	Atmospheric pollution; Disturbance; Water pollution	E	E	J	E	J	J	J	J	J	J	J	J	J	J	J
3049	Beacon Bottom East, Park Gate	Atmospheric pollution; Disturbance; Water pollution	E	E	J	E	J	J	J	J	J	J	J	J	J	J	J
3051	Hunts Pond Road, Titchfield Common	Atmospheric pollution; Disturbance; Water pollution	E	E	J	E	J	J	J	J	J	J	J	J	J	J	J
3070	Magistrates Court, Trinity Street, Fareham	Atmospheric pollution; Disturbance; Water pollution	E	E	J	E	J	J	J	J	J	J	J	J	J	J	J
3088	Warsash Maritime Academy	Atmospheric pollution; Disturbance; Water pollution; Aquatic/Atmospheric Pollution during Construction; Construction Noise; Construction and Operational Activity; shortened sight Lines	E	E	J	E	J	J	J	J	J	J	J	J	J	J	J
3113	Faraday Business Park, Daedalus East	Atmospheric pollution;Habitat Loss; Construction Noise; Construction and Operational Activity; shortened sight Lines	E	E	J	E	J	J	J	J	J	J	J	J	J	J	J
3114	Swordfish Business Park, Daedalus West	Atmospheric pollution; Habitat Loss; Construction Noise; Construction and Operational Activity; shortened sight Lines	E	E	J	E	J	J	J	J	J	J	J	J	J	J	J
3121	Funtley Road South, Fareham	Atmospheric pollution; Disturbance; Water pollution	E	E	J	E	J	J	J	J	J	J	J	J	J	J	J
3126	North & South of Greenaway Lane, Warsash	Atmospheric pollution; Disturbance; Water pollution; Construction pollution	E	E	J	E	J	J	J	J	J	J	J	J	J	J	J

Fareham Borough Local Plan Publication Plan Site Allocations and Policies			Butser Hill	Emer Bog	River Itchen	Solent & Isle of Wight Lagoons	Solent Maritime	The New Forest	Chichester & Langstone Harbours	Portsmouth Harbour	Solent & Dorset Coast	Solent & Southampton Water	The New Forest	Chichester & Langstone Harbours	Portsmouth Harbour	Solent & Southampton Water	The New Forest
			SAC						SPA					Ramsar			
3128	Southampton Road, Segensworth	Atmospheric pollution; Disturbance; Water pollution; Construction pollution	E	E	J	E	J	J	J	J	J	J	J	J	J	J	J
3138	The Winning Post, 77 Burridge Road	Atmospheric pollution; Disturbance; Water pollution	E	E	J	E	J	J	J	J	J	J	J	J	J	J	J
3149	Former Scout Hut, Coldeast Way, Sarisbury Green	Atmospheric pollution; Disturbance; Water pollution	E	E	J	E	J	J	J	J	J	J	J	J	J	J	J
3206	22-27a Stubbington Green	Atmospheric pollution; Disturbance; Water pollution	E	E	J	E	J	J	J	J	J	J	J	J	J	J	J
3227	Land at Locks Heath District Centre	Atmospheric pollution; Disturbance; Water pollution	E	E	J	E	J	J	J	J	J	J	J	J	J	J	J
3228	68 Titchfield Park Road	Atmospheric pollution; Disturbance; Water pollution	E	E	J	E	J	J	J	J	J	J	J	J	J	J	J
3231	Land at 51 Greenaway Lane	Atmospheric pollution; Disturbance; Water pollution	E	E	J	E	J	J	J	J	J	J	J	J	J	J	J
3233	Palmerston Car Park	Atmospheric pollution; Disturbance; Water pollution	E	E	J	E	J	J	J	J	J	J	J	J	J	J	J
3235	Former Filling Station, Locks Heath Rd	Atmospheric pollution; Disturbance; Water pollution	E	E	J	E	J	J	J	J	J	J	J	J	J	J	J
3244	Assheton Court, Porchester	Atmospheric pollution; Disturbance; Water pollution; Construction Noise; Construction and Operational Activity	E	E	J	E	J	J	J	J	J	J	J	J	J	J	J
ID	Strategic Policies	Likely Significant Effects															
DS1	Development in the Countryside		E	E	E	E	E	E	E	E	E	E	E	E	E	E	E
DS2	Development in Strategic Gaps		E	E	E	E	E	E	E	E	E	E	E	E	E	E	E
DS3	Landscape		D	D	D	D	D	D	D	D	D	D	D	D	D	D	D
ID	Housing Need and Supply																
H1	Housing Provision		A	A	A	A	A	A	A	A	A	A	A	A	A	A	A
HAx	Housing Allocations (HA1 to HA45, FTC1-6)	Atmospheric pollution; Disturbance; Water pollution; Construction Noise; Construction and Operational Activity; Shortened Sight Lines	E	E	J	E	J	J	J	J	J	J	J	J	J	J	J
ID	Housing Policies	Likely Significant Effects															
HP1	New Residential Development in the Countryside		E	E	E	E	E	E	E	E	E	E	E	E	E	E	E

Fareham Borough Local Plan Publication Plan Site Allocations and Policies			Butser Hill	Emer Bog	River Itchen	Solent & Isle of Wight Lagoons	Solent Maritime	The New Forest	Chichester & Langstone Harbours	Portsmouth Harbour	Solent & Dorset Coast	Solent & Southampton Water	The New Forest	Chichester & Langstone Harbours	Portsmouth Harbour	Solent & Southampton Water	The New Forest
			SAC						SPA					Ramsar			
HP2	New Small-Scale Development Outside Defined UrbanAreas		E	E	E	E	E	E	E	E	E	E	E	E	E	E	E
HP3	Change of Use to Garden Land		E	E	E	E	E	E	E	E	E	E	E	E	E	E	E
HP4	Five-Year Housing Land Supply		E	E	E	E	E	E	E	E	E	E	E	E	E	E	E
HP5	Provision of Affordable Housing		B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
HP6	Exceptions Sites		B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
HP7	Adaptable and Accessible Dwellings		B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
HP8	Older Persons' and Specialist Housing Provision		B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
HP9	Self and Custom Build Homes		B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
HP10	Ancillary Accomodation		B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
HP11	Gypsies, Travellers and Travelling Show People		E	E	E	E	E	E	E	E	E	E	E	E	E	E	E
HP12	Development Proposals within Solent Breezes Holiday Park		B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
ID	Employment	Likely Significant Effects															
E1	Employment Land Provision		A	A	A	A	A	A	A	A	A	A	A	A	A	A	A
E2	Faraday Business Park	Atmospheric pollution;Habitat Loss; Construction Noise; Construction and Operational Activity; shortened sight Lines	E	E	J	E	J	J	J	J	J	J	J	J	J	J	J
E3	Swordfish Business Park	Atmospheric pollution; Habitat Loss; Construction Noise; Construction and Operational Activity; shortened sight Lines	E	E	J	E	J	J	J	J	J	J	J	J	J	J	J
E4	Solent 2	Atmospheric pollution	E	E	J	E	J	J	E	J	J	J	J	E	J	J	J
E5	Existing Employment Areas		E	E	E	E	E	E	E	E	E	E	E	E	E	E	E
E6	Boatyards		B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
ID	Retail and Community Facilities	Likely Significant Effects															

Fareham Borough Local Plan Publication Plan Site Allocations and Policies				Butser Hill	Emer Bog	River Itchen	Solent & Isle of Wight Lagoons	Solent Maritime	The New Forest	Chichester & Langstone Harbours	Portsmouth Harbour	Solent & Dorset Coast	Solent & Southampton Water	The New Forest	Chichester & Langstone Harbours	Portsmouth Harbour	Solent & Southampton Water	The New Forest
				SAC						SPA					Ramsar			
	R1	Retail Hierarchy and Protecting the Vitality and Viability of Centres		A	A	A	A	A	A	A	A	A	A	A	A	A	A	A
	R2	Out-of-Town Proposals for Town Centre Uses		B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
	R3	Local Shops		B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
	R4	Community and Leisure Facilities		B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
	ID	Climate Change	Likely Significant Effects															
	CC1	Climate Change		D	D	D	D	D	D	D	D	D	D	D	D	D	D	D
	CC2	Managing Flood Risk and Sustainable Drainage Systems		D	D	D	D	D	D	D	D	D	D	D	D	D	D	D
	CC3	Coastal Change Management Areas		D	D	D	D	D	D	D	D	D	D	D	D	D	D	D
	CC4	Renewable and Low Carbon Energy		D	D	D	D	D	D	D	D	D	D	D	D	D	D	D
	ID	Natural Environment	Likely Significant Effects															
	NE1	Protection of Nature Conservation, Biodiversity and the Local Ecological Network		D	D	D	D	D	D	D	D	D	D	D	D	D	D	D
	NE2	Biodiversity Net Gain		D	D	D	D	D	D	D	D	D	D	D	D	D	D	D
	NE3	Recreational Disturbance on the Solent Special Protection Areas (SPAs)		M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
	NE4	Water Quality Effects on the Special Protection Areas (SPAs), Special Areas of Conservation (SACs) and Ramsar Sites of the Solent		M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
	NE5	Solent Wader and Brent Goose Sites		D	D	D	D	D	D	D	D	D	D	D	D	D	D	D
	NE6	Trees, Woodland and Hedgerows		D	D	D	D	D	D	D	D	D	D	D	D	D	D	D
	NE7	New Moorings		B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
	NE8	Air Quality		B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
	NE9	Green Infrastructure		B	B	B	B	B	B	B	B	B	B	B	B	B	B	B

Fareham Borough Local Plan Publication Plan Site Allocations and Policies				Butser Hill	Emer Bog	River Itchen	Solent & Isle of Wight Lagoons	Solent Maritime	The New Forest	Chichester & Langstone Harbours	Portsmouth Harbour	Solent & Dorset Coast	Solent & Southampton Water	The New Forest	Chichester & Langstone Harbours	Portsmouth Harbour	Solent & Southampton Water	The New Forest
				SAC						SPA					Ramsar			
	NE10	Provision and Protection of Open Space		B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
	NE11	Local Green Space		D	D	D	D	D	D	D	D	D	D	D	D	D	D	D
	ID	Transport and Infrastructure	Likely Significant Effects															
	TIN1	Sustainable Transport		B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
	TIN2	Highway Safety		B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
	TIN3	Road Network Improvements		C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
	TIN4	Infrastructure Delivery		B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
	ID	Design	Likely Significant Effects															
	D1	High Quality Design and Placemaking		B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
	D2	Ensuring Good Environmental Conditions		B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
	D3	Coordination of Development and Piecemeal Proposals		B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
	D4	Water Quality and Resources		B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
	D5	Internal Space Standards		B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
		Historic Environment	Likely Significant Effects															
	HE1	Historic Environment and Heritage Assets		D	D	D	D	D	D	D	D	D	D	D	D	D	D	D
	HE2	Conservation Areas		B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
	HE3	Designated Heritage Assets and/or their Settings		B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
	HE4	Archaeology		B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
	HE5	Locally Listed Buildings and Non-designated Heritage Assets		B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
	HE6	Heritage at Risk		B	B	B	B	B	B	B	B	B	B	B	B	B	B	B

Fareham Borough Local Plan Publication Plan Site Allocations and Policies	Butser Hill	Emer Bog	River Itchen	Solent & Isle of Wight Lagoons	Solent Maritime	The New Forest	Chichester & Langstone Harbours	Portsmouth Harbour	Solent & Dorset Coast	Solent & Southampton Water	The New Forest	Chichester & Langstone Harbours	Portsmouth Harbour	Solent & Southampton Water	The New Forest
	SAC						SPA					Ramsar			

		Assessment Key
	A	General statement of policy / aspiration
	B	Policy listing general criteria for testing the acceptability / sustainability of proposals
	C	Proposal referred to but not proposed by the plan
	D	Environmental protection / site safeguarding policy
	E	Policy/proposal steers change in such a way as to protect European sites from adverse effects
	F	Policy that cannot lead to development or other change
	G	Policy/proposal that could not have any conceivable effect on a European site
	H	Policy/proposal the (actual/theoretical) effects of which cannot undermine the conservation objectives (either alone or in combination with other aspects of this or any other plan/project)
	I	Policy/proposal with a likely significant effect on a European site alone
	J	Policy/proposal with an effect on a site but not likely to be significant alone; check for likely significant effects in combination
	K	Policy/proposal not likely to have a significant effect either alone or in combination (after the in combination test)
	L	Policy/proposal likely to have a significant effect in combination (after the in combination test)
	M	Bespoke area, site or case specific policies or proposals intended to avoid or reduce harmful effects on a European site

Butser Hill	Emer Bog	River Itchen	Solent & Isle of Wight Lagoons	Solent Maritime	The New Forest	Chichester & Langstone Harbours	Portsmouth Harbour	Solent & Dorset Coast	Solent & Southampton Water	The New Forest	Chichester & Langstone Harbours	Portsmouth Harbour	Solent & Southampton Water	The New Forest
SAC						SPA					Ramsar			

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Appendix III: Nutrient Technical Note

Please see insert.

Technical Note

URBAN EDGE ENVIRONMENTAL CONSULTING

Project	HRA for the Fareham Local Plan	**Date**	September 2020
Note	Nitrogen Budget	**Ref**	
Author	Giulia Civello	**Page**	1 of 5
Status	FINAL		

1. Introduction

There are high levels of nitrogen (N) and phosphorous (P) entering the water environment in the Solent with evidence of eutrophication at internationally designated sites. As part of the HRA accompanying the Fareham Local Plan, Fareham Borough Council has calculated a nutrient budget for the Borough over the emerging plan period 2021 to 2037. These calculations inform the assessment of adverse effects on the integrity of internationally designated sites and requirements for mitigation. Nitrogen is the principal nutrient driving eutrophication in the marine environment and therefore the budget is focused on the nitrogen budget. Phosphate is the principal driver in freshwater habitats; Natural England has advised that measures taken to reduce N pollution are likely to also be successful in reducing P pollution.

The calculation has been carried out using Natural England's methodology published in June 2020[1]. This document provides a breakdown of the nutrient budget by site allocated within the Local Plan together with an overview of those assumptions made in the Council's calculation.

2. Nutrient budget breakdown

The total nitrogen budget for Fareham Borough has been calculated as 2,536.99 kg/TN/year; a breakdown by site allocation is provided in Table 1. A positive figure indicates a surplus of nitrogen in the Borough and therefore mitigation will be required to achieve nutrient neutrality and avoid any impact to internationally designated sites in the Solent.

[1] Natural England (2020): *Advice on achieving nutrient neutrality for new development in the Solent region.* Version 5 – June 2020

Table 1: Nutrient budget by site allocation

Site code	Site name	Total Discharge of TN after WWTW Treatment, including 20% buffer (kg/TN/year)
FTC1	Palmerston Car Park	16.00
FTC2	Market Quay	70.54
FTC3	Fareham Station East	84.64
FTC4	Fareham Station West	66.30
FTC5	Crofton Conservatories	34.56
FTC6	Magistrates Court	31.74
HA1	Land North and South of Greenaway Lane	368.06
HA3	Southampton Road	246.29
HA4	Dowend Road East	-105.08
HA7	Warsash Maritime Academy	70.54
HA9	Heath Road	70.80
HA10	Funtley Road South	-43.17
HA12	Moraunt Drive	51.94
HA13	Hunts Pond Road	25.73
HA15	Beacon Bottom West	31.50
HA17	69 Botley Road	25.74
HA19	399-409 Hunts Pond Road	16.75
HA22	Wynton Way	9.17
HA23	Stubbington Lane	12.22
HA24	335-357 Gosport Road	5.64
HA26	Beacon Bottom East	6.35
HA27	Rookery Avenue	13.98
HA28	3-33 West Street, Portchester	18.34
HA29	Land East of Church Road	23.59
HA30	33 Lodge Road	6.35
HA31	Hammond Industrial Estate	24.05
HA32	Egmont Nursery	-2.65
HA33	Land East of Bye Road	11.63
HA34	Land South West of Sovereign Crescent	25.48
HA35	Former Scout Hut, Coldeast Way	4.94
HA36	Locks Heath District Centre	24.69
HA37	Former Locks Heath Filing Station	21.16
HA38	68 Titchfield Park Road	8.47
HA39	Land at 51 Greenaway Lane	3.53
HA40	Land West of Northfield Park	25.90
HA41	22-27a Stubbington Green	6.35
HA42	Cams Alders	56.72

Site code	Site name	Total Discharge of TN after WWTW Treatment, including 20% buffer (kg/TN/year)
HA43	Corner of Station Road, Porchester	11.29
HA44	Assheton Court	42.32
Windfall Development	N/A	1,110.58
HA45 Gypsy Traveller Site Allocation	The Winning Post, 77 Burridge Rd	4.01
Total		**2,536.99**

3. Nutrient budget calculation assumptions

In adopting Natural England's March 2020 methodology to calculate the Borough's nutrient budget the following assumptions have been made:

1. An average occupancy of 2.4 has been applied for each dwelling;
2. 90% of the permitted Nitrogen Consent Limit has been applied for Peel Common Waste Water Treatment Works (WWTW), equal to 6.1 mg/l TN;
3. Information about existing and future land use has been taken from any planning applications submitted for a particular allocation / site;
4. Where no such information was available to determine existing land use, Officer's knowledge of the site, aerial photography and tools such as Google Streetview were used to establish land use;
5. Where no such information was available to identify future urban and open space coverage, the following assumptions were applied:
    a. For sites <0.5ha 100% of the site area was assumed to be developed as urban land.
    b. For sites between 0.5ha and 1ha 80% of the site area assumed to be developed as urban land and 20% of the site area to be developed as open space.
    c. For sites of 1ha or greater 60% of the site areas was assumed to be developed as urban land and 40% assumed to be developed as open space.
    d. For completely urban brownfield sites within Fareham Town Centre, these sites were also assumed to be developed as 100% urban land.
6. Housing yields were taken from planning applications where available; where not available housing numbers were estimated based on either (i) promoted yield at the time of site submission or (ii) an applied density reflecting the density of the surrounding residential area.
7. A 20% precautionary buffer has been added to the nutrient surplus/deficit figure for each Housing Allocation.

In order to factor the windfall dwelling numbers into the nitrogen budget the following assumptions have been made:

1. Total windfall projections were multiplied by 2.4 to calculate the additional population arising from windfall development;

2. The percentage split between brownfield and greenfield development was calculated based on previous 3 years windfall data for Fareham borough: 60 brownfield : 40 greenfield split.
3. For all windfall development on brownfield land it has been assumed that there will be no change in land use i.e. urban land to urban land.
4. Information on whether greenfield windfall sites are on agricultural or not is not easily available so a precautionary approach has been adopted assuming that all greenfield windfall will be on non-agricultural land; therefore for the purpose of the budget calculation existing land use has been assumed as open space, with an associated nitrogen load of 5 kg/TN/yr.
5. All windfall development has been assumed to contain no open space provision and will be all urban coverage.
6. To estimate the area of land that windfall will cover in the Borough the average population density for the whole borough (15.7) was calculated then divided by the windfall dwelling numbers to give an overall area of these windfall developments will cover.

4. Nutrient mitigation schemes

Mitigation will be required to achieve nutrient neutrality in the Borough and avoid any adverse effects to the integrity of internally designated sites in the Solent. Three nutrient offset schemes have been identified to date which could contribute to the mitigation of the nitrogen surplus in the Borough. These are described in the paragraphs below.

Hampshire and Isle of Wight Wildlife Trust (HIWWT) – HIWWT will secure low quality arable land on the Isle of Wight. The scheme will change the land from an intensive use which requires large inputs of nitrogen rich fertiliser to an extensive use with no nitrogen inputs, such as traditionally grazed meadows, wetlands or woodland. Developers, working with local planning authorities and Natural England to agree a nitrogen budget for their development, will be able to purchase the required number of credits from HIWWT to offset the nitrogen surplus associated with their development. Credits of 1kg of nitrogen per year will be available to purchase for an agreed standard cost per credit, plus an additional fee to cover administration costs.

HIWWT will use the funds to purchase poor quality intensive agricultural land in locations agreed with Natural England and convert it to less intensive uses such as wildflower meadows, scrubland, woodland and wetlands. The income secured will cover land purchase and maintenance costs *in perpetuity*, thereby ensuring that the mitigation is in place for the lifetime of the development. Contributions from several developers will be pooled to acquire a few strategic offset sites which will be more cost effective but will also have greater environmental benefits than lots of smaller sites.

In January 2020, HIWWT had already started the process of purchasing a site on Wooton Creek on the Isle of Wight which Natural England has approved for offsetting inputs entering the Solent via Peel Common (serving Fareham, Eastleigh and Gosport Boroughs) and Budds Farm Waste Water Treatment Works (serving Winchester City, Portsmouth City, Havant Borough and East Hampshire District). This site will provide 1,075kg of nitrogen offset. HIWWT are actively discussing other land purchase options with a number of private estates and land agents. Should all of these sites be acquired, the HIWWT scheme would be able to offset over 12,000kg of nitrogen.

Gawthorpe Estate, Warnford – A nitrogen offsetting scheme is being developed at the Gawthorpe Estate in Warnford within Winchester City District. Land on the estate is being taken out of agricultural use and converted to less intensive uses, including woodland. As for the HIWWT scheme, developers will be able to purchase credits to mitigate nitrogen surplus associated with their development and the funds will be used to covert land on the estate to woodland. A planning application submitted for HA3 Southampton Road (application P/18/0068/0A) is currently pursuing the Warnford scheme as a means of mitigating its nitrogen surplus. The HRA accompanying the application explains that prior to the first occupation a woodland planting plan will be produced and approved by the LPA, along with a financial contribution to the South Downs National Park to undertake the required monitoring and enforcement of the plan to ensure the mitigation *in perpetuity*. It is understood that the Warnford scheme may be able to offset approximately 8,200kg of nitrogen.

Meon Marsh – The Meon Marsh scheme concerns a site located within Fareham Borough to the south east of Titchfield village with Bridge Street to the north and the B3334 (Titchfield Road) to the east. The River Meon forms the western and part of the southern boundary of the site. The site is currently comprised entirely of poor quality 'grazing marsh'. The proposal includes the retention and enhancement of the richest part of this habitat type, plus the addition of a range of new habitat types including wetlands. Wetlands receiving nitrogen-rich water can remove a proportion of this nitrogen through processes such as denitrification and sedimentation. If the proposals receive planning permission, developers would be able to purchase credits for the Meon Marsh to offset nitrogen surplus associated with their developments. The Meon Marsh site will require continual management to maintain its functionality and habitats. It is understood that according to the Applicant's modelling and calculations the site may be able to offset approximately 10,500kg of nitrogen per year.

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