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Habitats Regulations Assessment for the Welborne Plan

Appropriate Assessment Report on the Publication Draft Welborne Plan

January 2014

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Appropriate Assessment Report

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Contents

List of Tables and Figures

Abbreviations

AADT	Annual Average Daily Traffic
APIS	Air Pollution Information System
BAP	Biodiversity Action Plan
BRT	Bus Rapid Transport
C	Carbon
CAMS	Catchment Abstraction Management Strategy
CO_2	Carbon dioxide
CLG	Department of Communities and Local Government
DEFRA	Department of the Environment, Food and Rural Affairs
DMRB	Design Manual for Roads and Bridges
DON	Dissolved Organic Nitrogen
DPD	Development Plan Document
FBC	Fareham Borough Council
GIS	Geographic information systems
HAP	Habitat Action Plan
HBIC	Hampshire Biodiversity Information Centre
HCC	Hampshire County Council
HRA	Habitat Regulations Assessment
ICES	International Council for the Exploration of the Sea
IDP	Infrastructure Delivery Plan
IUCN	International Union for Conservation of Nature
JNCC	Joint Nature Conservancy Committee
LDF	Local Development Framework
LNR	Local Nature Reserve
N	Nitrogen
NO_2	Nitrogen dioxide
NO_x	Nitrogen oxides
NNR	National Nature Reserve
NPPF	National Planning Policy Framework
ODPM	Office of the Deputy Prime Minister
P	Phosphorous
PUSH	Partnership for Urban South Hampshire
RVEI	Road Verges of Ecological Importance
SA	Sustainability Appraisal
SAC	Special Area of Conservation
SANG	Suitable Alternative Green Space
SAP	Species Action Plan
SDMP	Solent Disturbance Mitigation Project
SEA	Strategic Environmental Assessment
SFRA	Strategic Flood Risk Assessment
SINC	Site of Importance for Nature Conservation
SPA	Special Protection Area
SRTM	Sub Regional Transport Model
SSSI	Site of Special Scientific Interest
UKCIP	UK Climate Impacts Programme
WeBS	Wetland Bird Survey
WTW	Wastewater Treatment Works

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Executive Summary

E1 Introduction

E1.1 This document sets out the Habitats Regulations Assessment for the Publication Draft Welborne Plan. It draws on information previously published in other documents which form part of the overall HRA procedure for the Welborne Plan, including the 2012 Baseline Data Review Report and the 2013 Screening Statement.

E1.2 The outputs of the report include information in relation to:

- Chapter 2 discusses the methodology for assessment, and updates the findings of the screening stage;
- Chapter 3 defines relevant European sites, their qualifying features and conservation objectives;
- Chapter 4 discusses the characteristics of European sites including available information about the population and ecology of qualifying species, and descriptions of qualifying habitats;
- Chapter 5 presents available data regarding the impact pathways that may negatively affect the ecological integrity of the European sites;
- Chapter 6 undertakes an assessment of these impacts in view of the sites' conservation objectives; and
- Chapter 7 presents a summary and concludes the document.

E2 Findings of the Screening Stage

E2.1 The updated screening assessment for the Publication Draft Welborne Plan found that the following proposed policies were likely to significantly affect European sites in the area, or the nature of their effects were uncertain. They were taken forward for more detailed Appropriate Assessment.

Proposed policy	Likely significant effect	Sites affected
WEL3 Allocation of land	Atmospheric pollution; Disturbance; Effects on supporting habitats; Water abstraction; Wastewater discharge	Butser Hill SAC; River Itchen SAC; Solent Maritime SAC; New Forest SAC/SPA/Ramsar; Chichester & Langstone Harbours SPA/Ramsar; Portsmouth Harbour SPA/Ramsar; Solent & Southampton Water SPA/Ramsar
WEL9 Employment	Atmospheric pollution	As above

Proposed policy	Likely significant effect	Sites affected
WEL10 The District Centre	Atmospheric pollution	As above
WEL23 Transport Principles	Atmospheric pollution	As above
WEL24 Strategic Road Access	Atmospheric pollution	As above
WEL25 Local Road Transport	Atmospheric pollution	As above
WEL37 Water Efficiency, Supply and Disposal	Water abstraction; Wastewater discharge	River Itchen SAC; Solent Maritime SAC; Solent & Southampton Water SPA/Ramsar

E3 Conclusions of the Appropriate Assessment

E3.1 It can be concluded that the Welborne Plan will not result in adverse effects on the ecological integrity of the Butser Hill SAC.

E3.2 It can be concluded that the Welborne Plan will not result in adverse effects on the ecological integrity of the New Forest SAC/Ramsar. It can also be concluded that the Welborne Plan will not result in adverse effects on the ecological integrity of the New Forest SPA.

E3.3 It can be concluded that the Welborne Plan will not result in adverse effects on the ecological integrity of the River Itchen SAC.

E3.4 With regards air pollution impacts, it can be concluded that the Welborne Plan will not result in adverse effects on the ecological integrity of the Solent Maritime SAC. However, there is currently uncertainty regarding the potential for wastewater treatment and discharge impacts on the Solent Maritime SAC, and it cannot currently be concluded that the development of Welborne will not adversely affect the ecological integrity of the site in this way. Section 5.6 discusses this impact in further detail.

E3.5 It can be concluded that the Welborne Plan will not result in adverse effects on the ecological integrity of the Chichester and Langstone Harbours SPA/Ramsar.

E3.6 It can be concluded that the Welborne Plan will not result in adverse effects on the ecological integrity of the Portsmouth Harbour SPA/Ramsar.

E3.7 With regards air pollution and disturbance impacts, and effects on supporting habitats, it can be concluded that the Welborne Plan will not result in adverse effects on the ecological integrity of the Solent and Southampton Water SPA/Ramsar. However, there is currently uncertainty regarding the potential for wastewater treatment and discharge impacts on the Solent and Southampton Water SPA/Ramsar, and it cannot currently be concluded that the development of Welborne will not adversely affect the ecological integrity of the site in this way. Section 5.6 discusses this impact in further detail.

E4 Recommendations

E4.1 Based on current traffic modelling results from the Sub-Regional Transport Model, there is predicted to be a significant increase in vehicle movements at the M27 Hamble crossing only. However, habitats present at this location are not sensitive to air pollution. Modelling results for the A27 near to Paulsgrove Lake indicate that future traffic flow could increase by 924 AADT vehicle movements, which is approaching a significant figure. The future project-level HRA for outline planning applications for development at Welborne will need to take this into account and demonstrate that the final proposed junction arrangements for the new community would not lead to a significant increase in traffic flow on any road link passing within 200m of SAC/SPA/Ramsar sites in and around the borough.

E4.2 It is recommended that ecological surveys are undertaken within Dash Wood to establish its capacity to accept significantly increased visitors numbers as a result of its planned allocation as SANG. If any of the area which is currently assumed to be able to contribute towards meeting the SANG requirement is in any way reduced following the surveys, then an equivalent area of SANG will need to be provided elsewhere. Existing surveys have indicated that Knowle Triangle and Fareham Common are of little intrinsic ecological value, apart from the Site of Importance to Nature Conservation on Fareham Common. Therefore, when they are laid out as SANG they should both be able to fully contribute to providing an alternative natural greenspace for visitors. Visitor surveys should be carried out at all three sites (Dash Wood, Knowle Triangle and Fareham Common) to inform an assessment of how they are currently used and guide planned improvements to SANG standard.

E4.3 It is further recommended that a continuing dialogue is established with the New Forest National Park regarding the ongoing studies it is undertaking to inform the Recreation Management Strategy. This should seek to establish whether, and at what point, any financial contribution towards implementing the RMS would be required, over and above the Welborne Plan's proposals for SANG and contributions to the SDMP avoidance and mitigation strategy.

E4.4 It is recommended that overwintering bird surveys within and adjacent to the Welborne policy boundary are continued to confirm that the level of use of the site by SPA/Ramsar species is not significant and/or is limited to areas such as the permanent pasture at Pook Lane (i.e. outside of the built footprint of the development). Surveys should build on the single season survey already undertaken, and continue for a total duration of at least three seasons.

E4.5 It is recommended that feasibility studies are undertaken to establish which WWTW option is preferred, or whether a combination of the two approaches could be utilised. Studies should include within their objectives the need to confirm that the preferred option would be capable of meeting the required environmental standards for discharge, as stipulated by proposed policy WEL37.

E5 Next Steps

E5.1 Following publication of the Welborne Plan and its Habitats Regulations Assessment, the Plan will move towards Examination in Public. Representations received on the Publication Draft Plan may necessitate further changes to the plan and, if so, significant changes will also be subject to further appraisal. This may lead to a further edition of the HRA Report being produced, or perhaps an Addendum to the current report, so that the findings of further appraisal can be circulated. The representations, proposed changes to the plan and HRA information will be submitted to the Planning Inspector to consider during the Examination in Public.

1 Introduction

1.1 Purpose of this Report

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

1.1.2 HRA is a requirement of the Conservation of Habitats and Species Regulations 2010 ('the Habitats Regulations'). The assessment focuses on the likely significant effects of the plan on the nature conservation interests of European-protected areas in and around Fareham borough, and seeks to establish whether or not there will be any adverse effects on the ecological integrity of these European sites as a result of proposals in the plan.

1.2 The Welborne Plan

1.2.1 The principle of developing a new community north of Fareham was established by the Fareham Borough Core Strategy and, before that, the South East Plan. The Core Strategy describes the vision for the new community – to be named Welborne – and sets the Broad Area of Search for locating the community together with overall development objectives, including provision for 6,500-7,500 dwellings and up to 90,750m^2 of employment floorspace[1]. It allows for flexibility in the Welborne Plan to adjust these objectives where necessary in order to achieve a successful, sustainable development. The Welborne Plan sets the policy boundary (Figure 1.1) and is exploring a range of alternative options, including the number of new homes to be developed, jobs to be provided, a transport strategy, and quantity and layout of green infrastructure.

1.2.2 To guide decision-making on future planning applications for the site, the Welborne Plan is being prepared by Fareham Borough Council. It includes planning policies and the Policy Map which delineates the area within which polices will apply and allocates certain land uses. These are accompanied by a Strategic Framework Diagram which is a spatial expression of the planning policies, and a Concept Masterplan which is a visual illustration of how they might be delivered on the ground. The Welborne Plan addresses housing development and the level of affordable housing, the amount, nature and location of employment opportunities and infrastructure needed to support the new community such as roads, public transport, schools and community facilities. It incorporates a green infrastructure strategy outlining how new open spaces will be created and maintained, and how connections to the countryside can be improved.

[1] Policy CS13 of the Fareham Core Strategy presents the broad development principles for the SDA.

1.3 Habitats Regulations Assessment

1.3.1 Habitats Regulations Assessment is a requirement of the Conservation of Habitats and Species Regulations 2010 (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 in England and Wales with the potential to adversely affect the ecological integrity of any sites designated for their nature conservation importance as part of a system known collectively as the Natura 2000 network of European sites.

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 (SACs, designated under the Habitats Directive) and Special Protection Areas (SPAs, designated under *European Council Directive 2009/147/EC on the conservation of wild birds* ('the Birds Directive')). Meanwhile, the National Planning Policy Framework (DCLG, 2012) 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.

1.4 Structure of this Document

1.4.1 The outputs of the report include information in relation to:

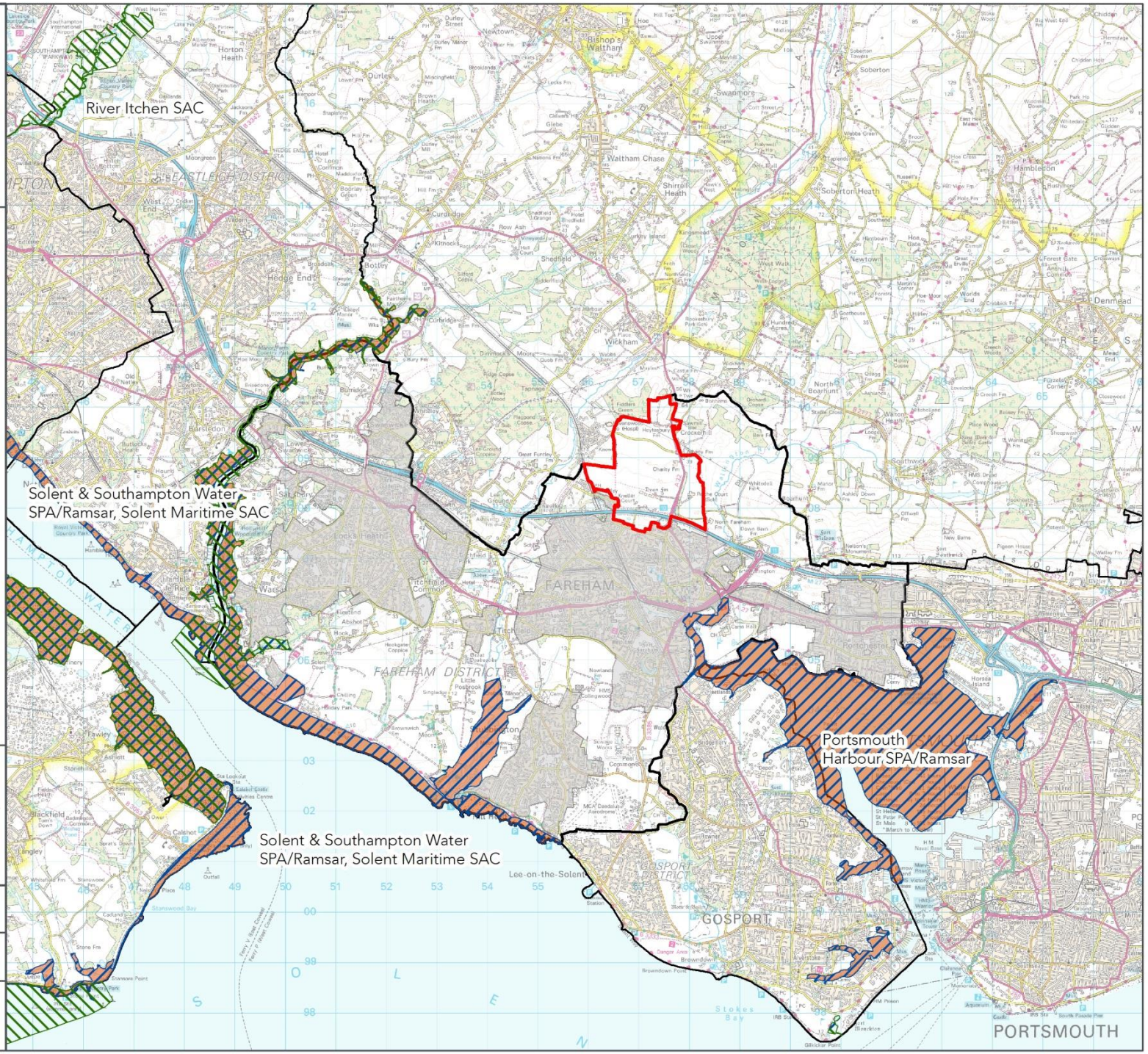
- Chapter 2 discusses the methodology for assessment, and updates the findings of the screening stage;
- Chapter 3 defines relevant European sites, their qualifying features and conservation objectives;
- Chapter 4 discusses the characteristics of European sites including available information about the population and ecology of qualifying species, and descriptions of qualifying habitats;
- Chapter 5 presents available data regarding the impact pathways that may negatively affect the ecological integrity of the European sites;
- Chapter 6 undertakes an assessment of these impacts in view of the sites' conservation objectives; and
- Chapter 7 presents a summary and concludes the document.

1.5 Relationship to other Documents

1.5.1 This HRA Report draws on information previously published in other documents which form part of the overall HRA procedure for the Welborne Plan, including:

- Baseline Data Review Report (UEEC, 2012); and
- Habitats Regulations Assessment for the New Community North of Fareham: Screening Statement (UEEC, 2013).

Welborne Policy Area



- Welborne Policy Boundary
- Special Area of Conservation
- Ramsar site
- Special Protection Area
- Urban Area
- Fareham Boundary

Figure 1.1: Welborne Policy Area and European sites

Contains data from Natural England 2013

0 1 2 Kilometers

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Scale	Date
1: 100,000	Jan14
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NP	NP

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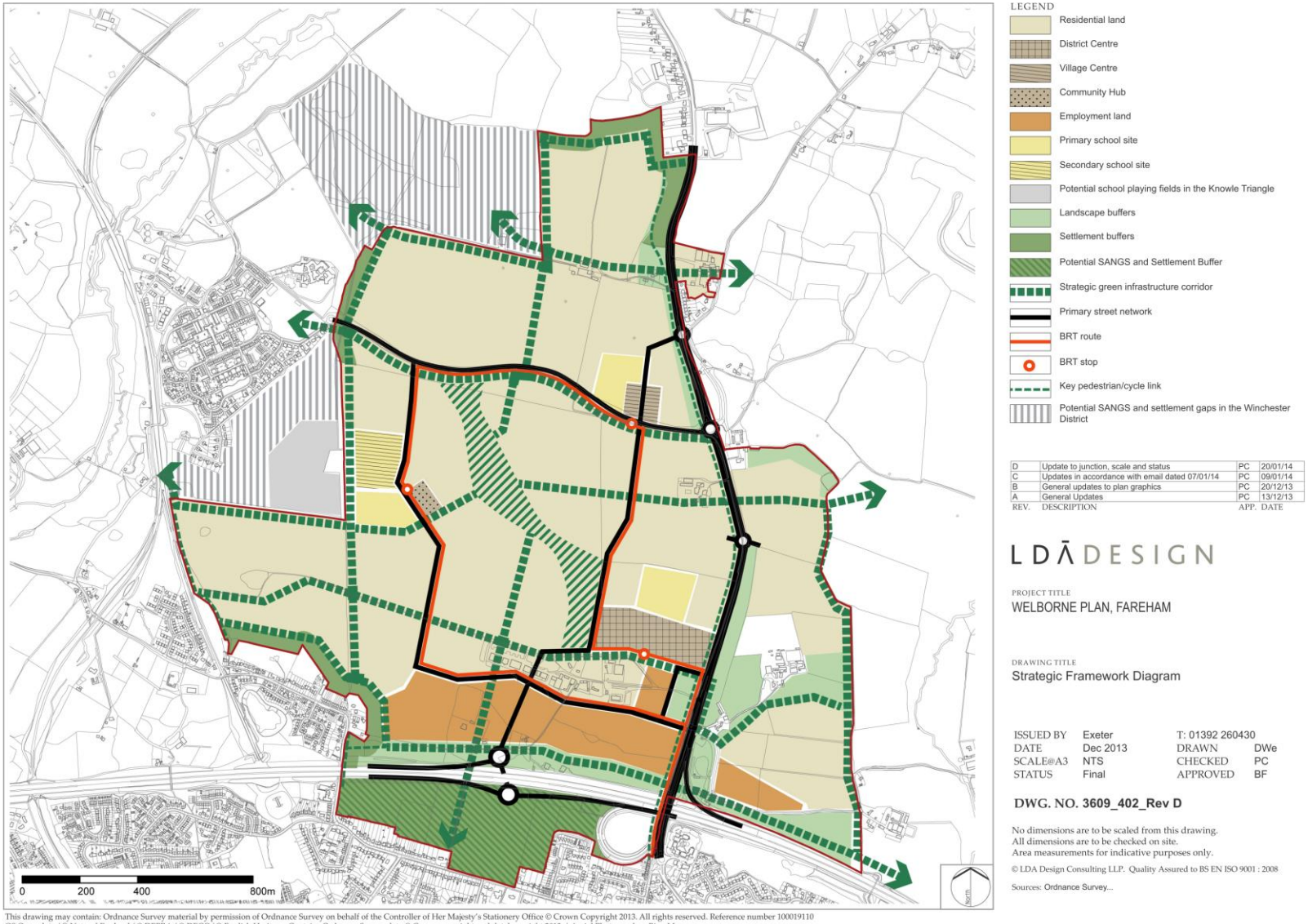

Figure 1.2: Strategic Framework Diagram (Source: FBC / LDA Design)

2 Methodology

2.1 Guidance and Best Practice

2.1.1 Draft guidance on HRA has been defined by DCLG (2006) with more detailed draft guidance from Natural England (Tyldesley, 2009) and a range of other bodies[2]. The guidance recognises that there is no statutory method for undertaking Habitats Regulations Assessment and that the adopted method must be appropriate to its purpose under the Habitats Directive and Regulations. DCLG guidance identifies three main stages to the HRA process:

- Screening: Analysing draft options for likely significant effects on internationally designated sites;
- Appropriate Assessment: Ascertaining the effects on site integrity; and
- Alternative Solutions: Devising alternatives to the plan options, avoidance or mitigation measures.

2.1.2 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. The European Commission (2000a) describes the principle as follows:

"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."

2.1.3 The hierarchy of intervention is important: where significant effects are likely or uncertain, decision-makers must firstly seek to avoid the effect through for example, a change of policy. If this is not possible, mitigation measures should be explored to remove or reduce significant effects. If neither avoidance, nor subsequent mitigation is possible, alternatives to the plan or

[2] For example European Commission (2001) and RSPB (Dodd *et al*, 2007)

project should be considered. Such alternatives should explore ways of achieving the objectives that avoid significant effects entirely. If there are no alternatives suitable for removing an adverse effect, decision-makers must demonstrate that there are Imperative Reasons of Overriding Public Interest to continue with the proposal. This is widely perceived as an undesirable position and should be avoided if at all possible.

2.2 Methodology

2.2.1 The guidance from DCLG and Natural England was written for use in assessing strategic plans. Where individual projects come into play, as may be the case for any individual site allocation requiring Appropriate Assessment for instance, it may prove to be more suitable to use previous guidance from Natural England's forerunner, English Nature (1997a&b, 1999 and 2001) in conjunction with guidance European Commission (2001) and Countryside Council for Wales (Tyldesley, 2011).

2.2.2 The overall objective of an Appropriate Assessment will be to ascertain whether any part of the plan will lead to an adverse effect on the ecological integrity of nearby European sites and, if so, make recommendations on how such effects can be avoided or mitigated. It will be carried out in accordance with the draft Natural England guidance (Tyldesley, 2009); see Table 2.1.

2.3 Screening

2.3.1 An HRA screening assessment was prepared for the Welborne Plan at the same time as the Options Appraisal for the Sustainability Appraisal, i.e. during 2012 and early 2013 and published in April 2013. The assessment focused on a series of options from various sources structured around each of the main policy areas being considered for inclusion in the plan. Each option was screened for likely significant effects on the European sites. Such effects can be sorted into one of 17 categories which are derived from the draft HRA guidance document produced for Natural England (Tyldesley, 2009). They help to determine which, if any, elements of the plan would be likely to have a significant effect on any interest feature of any European site, alone or in combination with other projects and plans, directly or indirectly. The 17 categories fall into four broader sections which are described as:

Category A	Elements of the plan / options that would have no negative effect on a European site at all
Category B	Elements of the plan / options that could have an effect, but the likelihood is there would be no significant negative effect on a European site either alone or in combination with other elements of the same plan, or other plans or projects
Category C	Elements of the plan / options that could or would be likely to have a significant effect alone and will require the plan to be subject to an appropriate assessment before it may be adopted
Category D	Elements of the plan / options that would be likely to have a significant effect in combination with other elements of the same plan, or other plans or projects and will require the plan to be subject to an appropriate assessment before the plan may be adopted

Table 2.1: Stages in the HRA process drawing on guidance from DCLG and Natural England

DCLG Stage	Natural England (Tyldesley) Steps		
AA1: Likely significant effects	1. Gather the evidence base about international sites.		
	2. Consult Natural England and other stakeholders on the method for HRA and sites to be included.		
	3. Screen elements of the plans for likelihood of significant effects.		
	4. Eliminate likely significant effects by amending the plan / option.		
	5. Consult Natural England and other stakeholders on the findings of the screening stage, and scope of the Appropriate Assessment if required.		
AA2: Appropriate Assessment and ascertaining the effect on integrity	6. Appropriate Assessment of elements of the plan likely to have significant effects on a European site.	8. Assess additions and changes to the plan and prepare draft HRA record.	ITERATIVE
AA3: Mitigation measures and alternative solutions	7. Amend the plan / option or take other action to avoid any adverse effect on integrity of European site(s).	9. Complete the draft Appropriate Assessment and draft HRA record.	
Reporting and recording	10. Submit draft HRA and supporting documents to Natural England.		
	11. Consult Natural England, other stakeholders and the public (if suitable).		
	12. Publish final HRA record and submit with Natural England letter to Inspector for Examination.		
	13. Respond to any representations relating to the HRA and to Inspector's questions.		
	14. Check changes to the plan, complete HRA record and establish any monitoring required.		

Findings of the screening stage

2.3.2 The categories, and traffic light colour-coded sub-categories, provide the means of recording the results of the assessment in such a way that important issues are identified whilst policies and proposed allocations that have no effect are screened out. Categories A, C and D are subdivided so that the specific reason why the assessor has allocated the policy or proposal to that category is more transparent, and more directly related to the ways in which the plan may affect a European site.

2.3.3 The initial screening assessment found that one or more of the options within each of the following policy areas themes was likely to significantly affect at least one European site:

- Site boundary
- Retail floorspace

- Use of land in Winchester district
- Location of secondary school
- Quantum of housing
- Transport network
- Energy
- Secondary school capacity/catchment
- Employment location
- Balance of public/private open space
- Use of Fareham Common
- Location of primary schools
- Avoiding and mitigating the impact on internationally protected sites

2.3.4 However, the screening assessment has since been repeated to assess the full suite of policies now proposed for inclusion in the plan; see Appendix I. A summary of the likely or uncertain significant effects of the Publication Draft Welborne Plan is given in Table 2.2.

Table 2.2: Summary of likely significant effects of the Publication Draft Welborne Plan

Proposed policy	Likely significant effect	Sites affected
WEL3 Allocation of land	Atmospheric pollution; Disturbance; Effects on supporting habitats; Water abstraction; Wastewater discharge	Butser Hill SAC; River Itchen SAC; Solent Maritime SAC; New Forest SAC/SPA/Ramsar; Chichester & Langstone Harbours SPA/Ramsar; Portsmouth Harbour SPA/Ramsar; Solent & Southampton Water SPA/Ramsar
WEL9 Employment	Atmospheric pollution	As above
WEL10 The District Centre	Atmospheric pollution	As above
WEL23 Transport Principles	Atmospheric pollution	As above
WEL24 Strategic Road Access	Atmospheric pollution	As above
WEL25 Local Road Transport	Atmospheric pollution	As above
WEL37 Water Efficiency, Supply and Disposal	Water abstraction; Wastewater discharge	River Itchen SAC; Solent Maritime SAC; Solent & Southampton Water SPA/Ramsar

2.4 Appropriate Assessment

2.4.1 The purpose of the Appropriate Assessment (HRA Stage AA2) 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 assessment should seek to establish whether or not the plan's effects, either alone or in combination with other plans or projects, will lead to adverse effects on site integrity, in view of the site's conservation objectives (see Chapter 3). Site integrity can be described as follows (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."*

2.5 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 the integrity of European sites. These effects may be exacerbated when experienced in combination with the effects of the Welborne 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 at Welborne, 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 the Appropriate Assessment for Welborne:

- Strategic Development at North of Whiteley
- West of Waterlooville, Havant
- Boorley Green development in Eastleigh borough
- Developments proposed at Tipner and Horsea Island in Portsmouth
- The Fareham Development Sites and Policies Plan
- Eastleigh Adopted Local Plan Review 2001-2011 (adopted 2006)
- Eastleigh Draft Local Plan (LDF) 2011-2029
- Winchester saved adopted policies in the Local Plan 2006
- Winchester Local Plan Part 1 - Joint Core Strategy (adopted 2013)
- Winchester emerging Local Plan Part 2 – Development Management and Allocations Document.
- Gosport Local Plan Review 2001 to 2016 (Adopted 2006)
- Gosport Borough Draft Local Plan 2011 to 2029
- Portsmouth City Local Plan saved policies (adopted 2006)
- The Portsmouth Plan (adopted 2012)
- Portsmouth AAPs (Somerstown and North Southsea AAP & Southsea Town Centre AAP)
- Portsmouth emerging Site Allocations DPD
- North Solent Shoreline Management Plan (December 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)

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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 Welborne, which could take place outside of the confines of the borough, possibly affecting European sites further afield.

3.1.2 During preliminary consultation on the Baseline Data Review Report, queries were raised as to whether Emer Bog SAC or Butser Hill SAC should be included within the scope of the HRA. Emer Bog SAC is designated for its transition mire and quaking bog habitat, and its condition is most vulnerable to local changes in water levels and input of agricultural nutrients from neighbouring land[3]; development in Welborne is unlikely to influence either of these factors. The site is not considered further.

3.1.3 Butser Hill SAC is designated for its semi-natural dry calcareous grasslands (*Festuco-Brometalia*) with chalk heath and mixed scrub, and yew *Taxus baccata* woodland (a priority feature). Both are vulnerable to input of nutrients from the air, including from road traffic, and the site is located very close to the A3 north of Havant. However, a recent HRA carried out by Winchester City Council and Havant Borough Council in relation to a major development area West of Waterlooville (c.2,550 dwellings) found that the site was unlikely to be significantly affected by increasing traffic flows as a result of development. Given the relative proximity of Butser Hill to Waterlooville (c.12km by road) in comparison to Welborne (c.28km by road) it is uncertain whether the site would be affected. However, the site is included in the scope of this HRA as a precautionary approach.

3.1.4 The scope of the assessment therefore includes the following sites, as depicted by Figure 3.1:

- Butser Hill SAC
- Solent & Isle of Wight Lagoons SAC
- The New Forest SAC
- Portsmouth Harbour SPA
- The New Forest SPA
- Portsmouth Harbour Ramsar
- The New Forest Ramsar
- River Itchen SAC
- Solent Maritime SAC
- Chichester & Langstone Harbours SPA
- Solent and Southampton Water SPA
- Chichester & Langstone Harbours Ramsar
- Solent and Southampton Water Ramsar

[3] For more information refer to the following hyperlinks:
http://www.sssi.naturalengland.org.uk/special/sssi/vam/VAM%201003510.pdf
http://jncc.defra.gov.uk/ProtectedSites/SACselection/n2kforms/UK0030147.pdf

Welborne Policy Area

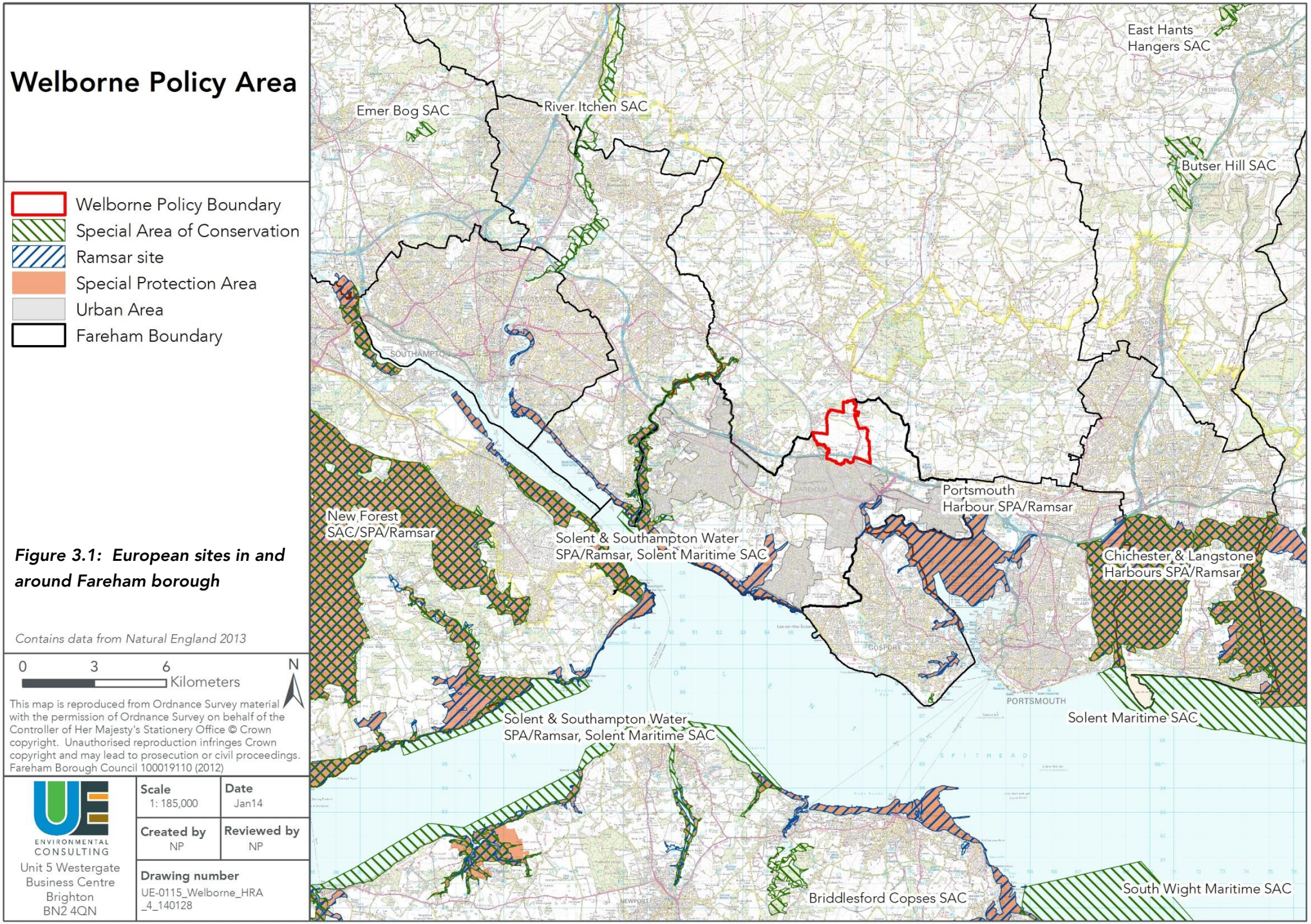

Figure 3.1: European sites in and around Fareham borough

Contains data from Natural England 2013

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Scale	Date
1: 185,000	Jan14
Created by	**Reviewed by**
NP	NP

Drawing number
UE-0115_Welborne_HRA_4_140128

3.1.5 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 summarises the qualifying features of each site for ease of reference.

3.1.6 The screening assessment showed that, of the 13 European sites considered, one (Solent and Isle of Wight Lagoons SAC) is not likely to be affected by the Welborne Plan. For three sites there was uncertainty at the screening stage as to whether they could be significantly affected (Butser Hill SAC and New Forest SAC/Ramsar). All other sites were considered likely to be significantly affected by the Welborne Plan.

3.2 Special Areas of Conservation

3.2.1 Special Areas of Conservation (SACs) are strictly protected sites designated under the EC Habitats Directive. 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 sites).

Butser Hill SAC

3.2.2 The Butser Hill Special Area of Conservation SAC covers an area of 238ha north-east of Fareham. The SAC was selected for its representation of two Annex 1 habitat types (Semi-natural dry grasslands and scrubland facies on calcareous substrates *Festuco-Brometalia* and Yew *Taxus baccata* woods of the British Isles which are a priority feature). These vegetation communities are described in Chapter 4.

River Itchen SAC

3.2.3 The River Itchen SAC covers an area of 309ha north-west of Fareham. The Itchen is a classic example of a sub-type 1 chalk river, which is dominated throughout by aquatic *Ranunculus spp.* The Itchen also supports Annex II species which are a primary reason for the selection of this site as an SAC. These are described in Chapter 4 of this report and comprise:

- White-clawed (or Atlantic stream) Crayfish *Austropotamobius pallipes*
- Southern Damselfly *Coenagrion mercuriale*
- Bullhead *Cottus gobio*
- Brook Lamprey *Lampetra planeri*
- Otter *Lutra lutra*
- Atlantic Salmon *Salmo salar.*

Table 3.1: European site qualifying features

Solent & Southampton Water SPA	Solent & Soton Water Ramsar	Chichester & Langstone SPA	Chichester & Langstone Ramsar
<u>Breeding</u> - Little Tern *Sterna albifrons* - Sandwich Tern *Sterna sandvicensis* - Common Tern *Sterna hirundo* - Mediterranean Gull *Larus melanocephalus* - Roseate Tern *Sterna dougallii* <u>Overwintering</u> - Black-tailed Godwit *Limosa limosa islandica* - Dark-bellied Brent Goose *Branta bernicla bernicla* - Ringed Plover *Charadrius hiaticula* - Teal *Anas crecca* <u>Bird Assemblage</u> - Over winter the area regularly supports 51,361 individual waterfowl (5 year peak mean 1998)	<u>Criterion 1</u> - Several outstanding wetland habitat types, including unusual double tidal flow, a major sheltered channel, saline lagoons, saltmarshes, estuaries, intertidal flats, shallow coastal waters, grazing marshes, reedbeds, coastal woodland and rocky boulder reefs <u>Criterion 2</u> - Nationally rare species assemblage <u>Criterion 5</u> - Winter assemblage of 51,343 waterfowl (5 year peak mean 02/03) <u>Criterion 6</u> <u>Breeding</u> - Sandwich Tern *Sterna sandvicensis* - Common Tern *Sterna hiruno* - Little Tern *Sterna albifrons* - Roseate Tern *Sterna dougallii* <u>Overwintering</u> - Black-tailed Godwit *Limosa limosa islandica* - Dark-bellied Brent Goose *Branta bernicla bernicla* - Teal *Anas crecca* <u>On passage</u> - Ringed Plover *Charadrius hiaticula*	<u>Breeding</u> - Little Tern *Sterna albifrons* - Common Tern *Sterna hirundo* - Sandwich Tern *Sterna sandvicensis* <u>Overwintering</u> - Bar-tailed Godwit *Limosa lapponica* - Pintail *Anas acuta* - Shoveler *Anas clypeata* - Eurasian Teal *Anas crecca* - Wigeon *Anas penelope* - Turnstone *Arenaria interpres* - Dark-bellied Brent Goose *Branta bernicla bernicla* - Sanderling *Calidris alba* - Dunlin *Calidris alpina alpina* - Ringed Plover *Charadrius hiaticula* - Red-breasted Merganser *Mergus serrator* - Eurasian Curlew *Numenius arquata* - Grey Plover *Pluvialis squatarola* - Shelduck *Tadorna tadorna* - Redshank *Tringa totanus* - Little Egret *Egretta garzetta* <u>Bird Assemblage</u> - Over winter the area regularly supports 93,230 individual waterfowl (5yr peak mean 1998)	<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 SPA	Portsmouth Harbour Ramsar	River Itchen SAC	Solent Maritime SAC
Overwintering - Dark-bellied Brent Goose *Branta bernicla bernicla* - Dunlin *Calidris alpina alpina* - Black-tailed Godwit *Limosa limosa islandica* - Red-breasted Merganser *Mergus serrator*	Criterion 3 *- Species assemblage of importance to maintaining biogeographic biodiversity* Criterion 6 Overwintering - Dark-bellied Brent Goose *Branta bernicla bernicla*	Annex I Habitat - Water courses of plain to montane levels with the *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation Annex II Species - White-clawed (or Atlantic stream) Crayfish *Austropotamobius pallipes* - Southern damselfly *Coenagrion mercuriale* - Bullhead *Cottus gobio* - Brook Lamprey *Lampetra planeri* - Otter *Lutra lutra* - Atlantic Salmon *Salmo salar.*	Annex I Habitat - Estuaries - *Spartina* swards (*Spartinion maritimae*) - Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*) - Sandbanks - slightly covered by sea water all the time - Mudflats and sandflats not submerged at low tide - Annual vegetation drift lines - Perennial vegetation of stony banks - *Salicornia* and other annuals colonising mud and sand - Shifting white dunes with *Ammophila arenaria* - Coastal lagoons***** Annex II Species - Desmoulin's whorl snail *Vertigo moulinsiana*
The New Forest SPA	**The New Forest Ramsar**	**The New Forest SAC**	**Butser Hill SAC**
Breeding - Nightjar *Caprimulgus europaeus* - Woodlark *Lullula arborea* - Honey Buzzard *Pernis apivorus* - Dartford Warbler *Sylvia undata* Overwintering	Criterion 1 Valley mires and wet heaths are found throughout the site and are of outstanding scientific interest. The mires and heaths are within catchments whose uncultivated and undeveloped state buffer the mires against adverse ecological change. This is the	Annex I Habitat - Oligotrophic waters containing very few minerals of sandy plains (*Littorelletalia uniflorae*) - Oligotrophic to mesotrophic standing waters with vegetation of the *Littorelletea uniflorae* and/or of the *Isoëto-*	Annex I Habitat - Semi-natural dry grasslands and scrubland facies on calacareous substrates (F*estuco-Brometalia)* - *Taxus baccata* woods of the British Isles *****

- Hen Harrier *Circus cyaneus*	largest concentration of intact valley mires of their type in Britain <u>Criterion 2</u> Diverse assemblage of wetland plants and animals including several nationally rare species. Seven species of nationally rare plant are found on the site, as are at least 65 British Red Data Book species of invertebrate <u>Criterion 3</u> The mire habitats are of high ecological quality and diversity and have 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	*Nanojuncetea* - Northern Atlantic wet heaths with *Erica tetralix* - European dry heaths - *Molinia* meadows on calcareous, peaty or clayey-silt-laden soils (*Molinion caeruleae*) - Depressions on peat substrates of the *Rhynchosporion* - Atlantic acidophilous beech forests with *Ilex* and sometimes also *Taxus* in the shrublayer (*Quercion robori-petraeae* or *Ilici-Fagenion*) - *Asperulo-Fagetum* beech forests - Old acidophilous oak woods with *Quercus robur* on sandy plains - Bog woodland ***** - Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion*, *Alnion incanae*, *Salicion albae*) ***** - Transition mires and quaking bogs. <u>Annex II Species</u> - Southern damselfly *Coenagrion mercuriale* - Stag beetle *Lucanus cervus* - Great crested newt *Triturus cristatus*	**Solent and IoW Lagoons SAC** <u>Annex I Habitat</u> - Coastal lagoons*****

* Denotes priority feature

Solent Maritime SAC

3.2.4 The Solent Maritime SAC was selected for a total of three Annex 1 habitat types. A further seven habitat types were subsequently identified as being present as qualifying features:

- Estuaries
- *Spartina* swards
- Atlantic salt meadows
- Sandbanks which are slightly covered by water at all times
- Mudflats and sandbanks not covered by water at all times
- Coastal lagoons (Priority feature)
- Annual vegetation of drift lines
- Perennial vegetation of stony banks
- *Salicornia* and other annuals colonising mud and sand
- Shifting dunes along the shoreline with *Ammophila arenaria*

3.2.5 The site also supports Desmoulin's Whorl Snail *Vertigo moulinsiana* which is an Annex II species listed as a qualifying feature of the SAC.

New Forest SAC

3.2.6 The New Forest SAC is a complex habitat mosaic which encompasses a wide range of Annex I Habitats which are qualifying features for its selection as an SAC. These are:

- Oligotrophic waters containing very few minerals of sandy plains (*Littorelletalia uniflorae*)
- Oligotrophic to mesotrophic standing waters with vegetation of the *Littorelletea uniflorae* and/or of the *Isoëto-Nanojuncetea*
- Northern Atlantic wet heaths with *Erica tetralix*
- European dry heaths
- *Molinia* meadows on calcareous, peaty or clayey-silt-laden soils (*Molinion caeruleae*)
- Depressions on peat substrates of the *Rhynchosporion*
- Atlantic acidophilous beech forests with *Ilex* and sometimes also *Taxus* in the shrublayer (*Quercion robori-petraeae* or *Ilici-Fagenion*)
- *Asperulo-Fagetum* beech forests
- Old acidophilous oak woods with *Quercus robur* on sandy plains
- Bog woodland (Priority habitat)
- Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion*, *Alnion incanae*, *Salicion albae)* (Priority habitat)
- Transition mires and quaking bogs

3.2.7 The SAC also supports a number of species of conservation importance; those listed as qualifying species are the Southern Damselfly, Stag Beetle *Lucanus cervus* and Great Crested Newt *Triturus cristatus.*

3.3 Special Protection Areas

3.3.1 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. 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. These areas are known as Special Protection Areas (SPA). The following accounts are from JNCC[4].

Solent and Southampton Water SPA

3.3.2 The Solent and Southampton Water SPA 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 and covers an area of some 5,505ha incorporating twenty two component Sites of Special Scientific Interest (SSSI). 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.

3.3.3 In summer, the SPA is of importance for breeding seabirds, including gulls and four species of tern. In winter, the SPA holds a large and diverse assemblage of waterbirds, including geese, ducks and waders. Dark-bellied Brent Goose *Branta bernicla bernicla* also feed in surrounding areas of agricultural land outside the designated site boundaries.

3.3.4 The Solent and Southampton Water Special Protection Area (SPA) qualifies under Article 4.1 of the Birds Directive (2009/147/EC) by supporting populations of European importance of the following species listed on Annex 1 of the Directive. Population numbers and significance are as stated at the time of the 2001 SPA review:

- Little Tern *Sterna albifrons*, 49 pairs representing at least 2.0% of the breeding population in Great Britain (5 year peak mean, 1993-1997)
- 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)
- Mediterranean Gull *Larus melanocephalus* 2 pairs representing at least 20.0% of the breeding population in Great Britain (5 year peak mean, 1994-1998)

[4] JNCC SPA Review 2001, Site Accounts: [accessed Dec 2013]: http://jncc.defra.gov.uk/default.aspx

- Roseate Tern *Sterna dougalli* 2 pairs representing at least 3.3% of the breeding population in Great Britain (5 year peak mean, 1993-1997)

3.3.5 The site also qualifies under Article 4.2 of the Birds Directive by supporting populations of the following regularly occurring migratory species:

- Black-tailed Godwit *Limosa limosa islandica* 1,125 individuals representing at least 1.6% of the wintering Icelandic-breeding population (5 year peak mean, 1992/3-1996/7)
- 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)
- 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)
- Teal *Anas crecca* 4,400 individuals representing at least 1.1% of the wintering North-western Europe population (5 year peak mean, 1992/3-1996/7)

3.3.6 The SPA also qualifies under Article 4.2 of the Birds Directive due to supporting an internationally important assemblage of birds. Over winter the area regularly supports: 93,230 waterfowl (5 year peak mean 01/04/1998) which include: Dark-bellied Brent Goose , Shelduck *Tadorna tadorna* , Wigeon *Anas penelope* , Teal, Pintail *Anas acuta* , Shoveler *Anas clypeata* , Red-breasted Merganser *Mergus serrator* , Ringed Plover, Grey Plover *Pluvialis squatarola* , Sanderling *Calidris alba* , Dunlin *Calidris alpina alpina* , Bar-tailed Godwit *Limosa lapponica* , Curlew *Numenius arquata* , Redshank *Tringa totanus* , Turnstone *Arenaria interpres.*

Chichester and Langstone Harbours SPA

3.3.7 Chichester and Langstone Harbours are located in east Hampshire and West Sussex. 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* species, and eelgrasses *Zostera* spp. The estuarine basins contain 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.

3.3.8 The Chichester and Langstone Harbours SPA qualifies under Article 4.1 of the Birds Directive by supporting breeding populations of the following species listed on Annex I of the Directive:

- Little Tern *Sterna albifrons*, 100 pairs representing up to 4.2% of the breeding population in Great Britain (5 year mean, 1992-1996)
- Sandwich Tern *Sterna sandvicensis*, 158 pairs representing up to 1.1% of the breeding population in Great Britain (1998)
- Common Tern *Sterna hirundo*, 0.3% of the breeding population in Great Britain (5 year mean, 1992-1996)

3.3.9 It also qualifies under Article 4.1 by supporting the following overwintering Annex 1 species:

- Little Egret *Egretta garzetta*, 137 individuals representing up to 17.1% of the population in Great Britain (Count as at 1998), 100 individuals representing up to 20.0% of the wintering population in Great Britain (Count as at 1998)
- Bar-tailed Godwit *Limosa lapponica*, 1,692 individuals representing up to 3.2% of the wintering population in Great Britain (5 year peak mean 1991/2 - 1995/6)

3.3.10 The Chichester and Langstone Harbours SPA also qualifies under Article 4.2 of the Directive by supporting overwintering populations of European importance of the following regularly occurring migratory species:

- Dark-bellied Brent Goose *Branta bernicla bernicla*, 17,119 individuals representing up to 5.7% of the wintering Western Siberia/Western Europe population (5 year peak mean 1991/2 - 1995/6)
- Dunlin *Calidris alpina alpina*, 44,294 individuals representing up to 3.2% of the wintering Northern Siberia/Europe/Western Africa population (5 year peak mean 1991/2 - 1995/6)
- Grey Plover *Pluvialis squatarola*, 3,825 individuals representing up to 2.5% of the wintering Eastern Atlantic - wintering population (5 year peak mean 1991/2 - 1995/6)
- Redshank *Tringa totanus*, 1,788 individuals representing up to 1.2% of the wintering Eastern Atlantic - wintering population (5 year peak mean 1991/2 - 1995/6)
- Ringed Plover *Charadrius hiaticula*, 846 individuals representing up to 1.7% of the wintering Europe/Northern Africa - wintering population (5 year peak mean 1991/2 - 1995/6)
- Eurasian wigeon *Anas penelope* 2,055 individuals, representing 0.7% of the population in Great Britain (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)
- Shoveler *Anas clypeata* 100 individuals, representing 1% of the population in Great Britain (5 year peak mean 1991/92-1995/96)
- Eurasian Teal *Anas crecca* 1,824 individuals, representing 0.5% of the population (5 year peak mean 1991/92-1995/96)
- Turnstone *Arenaria interprens* 430 individuals, representing 0.7% of the population in Great Britain (5 year peak mean 1991/92-1995/96)
- Sanderling *Calidris alba* 236 individuals, representing 0.2% of the 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)
- Curlew *Numenius arquata* 1,861 individuals, representing 1.6% 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)

3.3.11 Over winter the area regularly supports: 93,230 waterfowl (5 year peak mean 01/04/1998) qualifying it under Article 4.2 of the Birds Directive, including: Dark-bellied Brent Goose, Shelduck, Wigeon, Teal, Pintail, Shoveler, Red-breasted Merganser, Ringed Plover, Grey Plover, Sanderling, Dunlin, Bar-tailed Godwit, Curlew, Redshank, Turnstone.

Portsmouth Harbour SPA

3.3.12 The Portsmouth Harbour SPA, an area of 1,248ha, is a large industrialised estuary and includes one of the four largest expanses of mud-flats and tidal creeks on the south coast of Britain. The mud-flats support large beds of Narrow-leaved Eelgrass *Zostera angustifolia* and Dwarf Eelgrass *Z. noltii*, extensive green algae beds, mainly *Enteromorpha* species, and Sea Lettuce *Ulva lactuca*. Portsmouth Harbour has only a narrow connection to the sea via the Solent, and receives comparatively little fresh water, thus giving it an unusual hydrology. The site supports important numbers of wintering Dark-bellied Brent Goose, which feed also in surrounding agricultural outside of the designated site boundaries.

3.3.13 The Portsmouth Harbour SPA qualifies under Article 4.2 of the Birds Directive by supporting breeding populations of European importance of the following regularly occurring migratory species:

- Dark-bellied Brent Goose *Branta bernicla bernicla*, 2,847 individuals representing at least 0.9% of the W Siberian/W European population (5 year peak mean 1991/92-1995/96)
- Dunlin *Calidris alpina alpina*, (Northern Siberia/Europe/Western Africa) 5,123 individuals representing 1% of the population in Great Britain (5 year peak mean 1991/92-1995/96)
- Black-tailed Godwit *Limosa limosa islandica* (Iceland-breeding) 31 individuals, representing 0.4% of the population in Great Britain (5 year peak mean 1991/92-1995/96)
- Red-breasted Merganser *Mergus serrator* (North-western/Central Europe) 87 individuals, representing 0.9% of the population in Great Britain (5 year peak mean 1991/92-1995/96)

New Forest SPA

3.3.14 The New Forest SPA covers an area of over 28,000ha located in southern Hampshire, west of the Solent. It comprises a complex mosaic of habitats overlying mainly nutrient-poor soils over plateau gravels. The major components are the extensive wet and dry heaths with their rich valley mires and associated wet and dry grasslands, the ancient pasture woodlands and inclosure woodlands, the network of clean rivers and streams, and frequent permanent and temporary ponds.

3.3.15 The New Forest SPA qualifies under Article 4.1 of the Birds Directive by supporting breeding populations of the following species listed on Annex I of the Directive:

- Dartford Warbler *Sylvia undata*, 538 pairs representing at least 33.6% of the breeding population in Great Britain
- Honey Buzzard *Pernis apivorus*, 2 pairs representing at least 10.0% of the breeding population in Great Britain

- Woodlark *Lullula arborea*, 184 pairs representing at least 12.3% of the breeding population in Great Britain (Count as at 1997)
- Nightjar *Caprimulgus europaeus*, 300 pairs representing at least 8.8% of the breeding population in Great Britain

3.3.16 It also qualifies under Article 4.1 by supporting the following overwintering Annex 1 species:

- Hen Harrier *Circus cyaneus*, 15 individuals representing at least 2.0% of the wintering population in Great Britain

3.4 Ramsar Sites

3.4.1 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 Special Protection Areas (SPAs) classified under the Birds Directive as is the case with the sites which are being considered by this assessment.

Solent and Southampton Water Ramsar

3.4.2 The Solent and Southampton Water Ramsar site qualifies under the following Ramsar Convention criteria:

- Criterion 1: The site is one of the few major sheltered channels between a substantial island and mainland in European waters, exhibiting an unusual strong double tidal flow and has long periods of slack water at high and low tide. It includes 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: The site supports an important assemblage of rare plants and invertebrates. At least 33 British Red Data Book invertebrates and at least eight British Red Data Book plants are represented on site.
- Criterion 5: The site supports an internationally important assemblage of species; 51,343 waterfowl over winter (5 year peak mean 1998/99-2002/2003).
- Criterion 6: The site supports species or populations occurring at international levels of importance comprising the following species.

Breeding

- Roseate Tern *Sterna dougallii* 1 apparently occupied nests, representing an average of 1.9% of the GB population (Seabird 2000 Census)
- Little Tern *Sterna albifrons* 22 apparently occupied nests, representing an average of 1.1% of the GB population (Seabird 2000 Census)
- Sandwich Tern *Sterna sandivicensis* 268 apparently occupied nests, representing an average of 2.5% of the GB population (Seabird 2000 Census)

- Common Tern *Sterna Hirundo* 192 apparently occupied nests, representing an average of 1.8% of the GB population (Seabird 2000 Census)
- Mediterranean Gull , *Larus melanocephalus,* 11 apparently occupied nests, representing an average of 10.1% of the GB population (Seabird 2000 Census)
- Black-headed Gull *Larus ridibundus, 6*,911 apparently occupied nests, representing an average of 5.4% of the GB population (Seabird 2000 Census)

On passage

- Ringed Plover *Charadrius hiaticula* 397 individuals, representing an average of 1.2% of the GB population (5 year peak mean 1998/9-2002/3)

Overwintering

- Dark-bellied Brent Goose *Branta bernicla bernicla* 6,456 individuals, representing an average of 3% of the population (5 year peak mean 1998/9-2002/3)
- Teal *Anas crecca* 5,514 individuals, representing an average of 1.3% of the north western European population (5 year peak mean 1998/9-2002/3)
- Black-tailed Godwit *Limosa limosa islandica* 1,240 individuals, representing an average of 3.5% of the population (5 year peak mean 1998/9-2002/3)

Chichester and Langstone Harbours Ramsar

3.4.3 The Chichester and Langstone Harbours Ramsar site qualifies under the following Ramsar Convention criteria:

- Criterion 1: The site comprises of two large estuarine basins linked by the channel which divides Hayling Island from the main Hampshire coastline. The site includes intertidal mudflats, saltmarsh, sand and shingle spits and sand dunes.
- Criterion 5: The site supports an internationally important assemblage of species; 76,480 waterfowl over winter (5 year peak mean 1998/99-2002/2003).
- Criterion 6: The site supports species or populations occurring at international levels of importance comprising the following species.

Breeding (identified subsequent to designation)

- Little Tern *Sterna albifrons albifrons* 130 apparently occupied nests, representing an average of 1.1% of the breeding population (Seabird 2000 Census)

On passage

- Ringed Plover *Charadrius hiaticula*, 853 individuals representing up to 1.1% of the wintering Europe/Northern Africa population (5 year peak mean 1998/9 - 2002/3)
- Black-tailed Godwit *Limosa limosa islandica* 906 individuals, representing an average of 2.5% of the Iceland/W. Europe population (5 year peak mean 1998/9 - 2002/3)
- Common Redshank *Tringa totanus totanus* 2,577 individuals, representing an average of 1% of the population (5 year peak mean 1998/9-2002/3)

Overwintering

- Dark–bellied Brent Goose *Branta bernicla bernicla* 1,987 individuals, representing an average of 6% of the population (5 year peak mean 1998/9-2002/3)
- Common Shelduck *Tadorna tadorna* 1,468 individuals, representing an average of 1.8% of the GB population (5 year peak mean 1998/9-2002/3)
- Grey Plover *Pluvialis squatarola* 3,043 individuals, representing an average of 1.2% of the E Atlantic/W. Africa population (5 year peak mean 1998/9-2002/3)
- Dunlin *Calidris alpina alpina* 33,436 individuals, representing an average of 2.5% of the W Siberia/W Europe population (5 year peak mean 1998/9-2002/3)

Portsmouth Harbour Ramsar

3.4.4 The Portsmouth Harbour Ramsar site qualifies under the following Ramsar Convention criteria:

- Criterion 3: The site supports a species assemblage of importance to maintaining biogeographic biodiversity. The intertidal mudflat areas possess extensive beds of eelgrass *Zostera angustifolia* and *Zostera noltei* which support the grazing Dark-bellied Brent Goose populations. The mud-snail *Hydrobia ulvae* is found at extremely high densities, which helps to support the wading bird interest of the site. Common cord-grass *Spartina anglica* dominates large areas of the saltmarsh and there are also extensive areas of green algae *Enteromorpha* spp. and sea lettuce *Ulva lactuca*. More locally the saltmarsh is dominated by sea purslane *Halimione portulacoides* which gradates to more varied communities at the higher shore levels. The site also includes a number of saline lagoons hosting nationally important species.
- Criterion 6: The site supports the following overwintering species / populations occurring at international levels of importance:
    - Dark–bellied Brent Goose *Branta bernicla bernicla* 2,105 individuals, representing an average of 2.1% of the GB population (5 year peak mean 1998/9-2002/3)

New Forest Ramsar

3.4.5 The New Forest Ramsar site qualifies under the following Ramsar Convention criteria:

- Criterion 1: Valley mires and wet heaths are found throughout the site and are of outstanding scientific interest. The mires and heaths are within catchments whose uncultivated and undeveloped state buffer the mires against adverse ecological change. This is the largest concentration of intact valley mires of their type in Britain.
- Criterion 2: The site supports a diverse assemblage of wetland plants and animals including several nationally rare species. Seven species of nationally rare plant are found on the site, as are at least 65 British Red Data Book species of invertebrate.
- Criterion 3: The mire habitats are of high ecological quality and diversity and have 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.

3.5 Conservation Objectives for SAC and SPA

3.5.1 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 recently defined by Natural England for the SACs and SPAs included within the scope of this HRA are given in Table 3.2.

3.6 Conservation Objectives for Ramsar Sites

3.6.1 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.

3.6.2 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.

3.6.3 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.

3.7 Condition Status

3.7.1 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 of SSSIs forming part of the European sites within the scope of this assessment are summarised in Appendix II.

Table 3.2: Conservation objectives for SAC and SPA

Conservation objectives for SAC

With regard to the natural habitats and/or species for which the sites have been designated, the over-riding conservation objective for each of the qualifying habitats/species has been defined by Natural England as:

> *"Avoid the deterioration of the qualifying natural habitats and the habitats of qualifying species, and the significant disturbance of those qualifying species, ensuring the integrity of the site is maintained and the site makes a full contribution to achieving Favourable Conservation Status of each of the qualifying features."*

Conservation objectives for the Butser Hill SAC, River Itchen SAC New Forest SAC and Solent Maritime SAC would therefore be, subject to natural change, to maintain or restore the:

- **Objective 1:** The extent and distribution of qualifying natural habitats and habitats of qualifying species;
- **Objective 2:** The structure and function (including typical species) of qualifying natural habitats and habitats of qualifying species;
- **Objective 3:** The supporting processes on which qualifying natural habitats and habitats of qualifying species rely;
- **Objective 4:** The populations of qualifying species;
- **Objective 5:** The distribution of qualifying species within the site.

Conservation objectives for SPA

With regard to the individual species and/or assemblage of species for which the sites have been classified, the over-riding conservation objective for each of the qualifying species has been defined by Natural England as:

> *"Avoid the deterioration of the habitats of the qualifying features, and the significant disturbance of the qualifying features, ensuring the integrity of the site is maintained and the site makes a full contribution to achieving the aims of the Birds Directive."*

Conservation objectives for the Chichester and Langstone Harbours SPA, Portsmouth Harbours SPA, Solent and Southampton Water SPA and New Forest SPA would therefore be, subject to natural change, to maintain or restore the:

- **Objective 1:** The extent and distribution of the habitats of the qualifying features;
- **Objective 2:** The structure and function of the habitats of the qualifying features;
- **Objective 3:** The supporting processes on which the habitats of the qualifying features rely;
- **Objective 4:** The populations of the qualifying features;
- **Objective 5:** The distribution of the qualifying features within the site.

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[5], published by the Joint Nature Conservancy Committee (JNCC; 2001), together with a review of other available literature on the behaviour and ecology of these species[6]. Where available species accounts have been supplemented by core count data presented in the Wetlands Bird Survey (WeBS) report for 2010/11 (Holt *et al*. 2012).

4.1.2 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.

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.

4.1.4 The UK population of Dark-bellied Brent Geese is estimated at 103,300 individuals representing 31% of the biogeographic population (Kirby 1995), 94% of which 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 (IUCN 2013).

[5] http://jncc.defra.gov.uk/page-1412

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

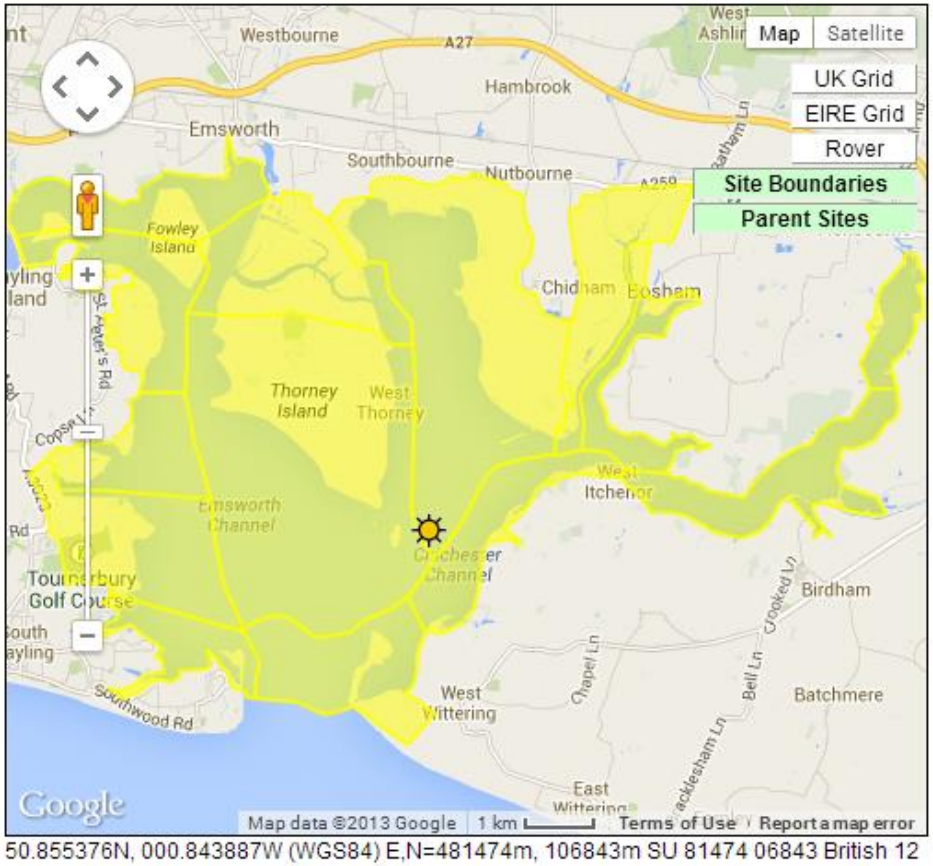

Figure 4.1: Chichester Harbour WeBS Survey Area

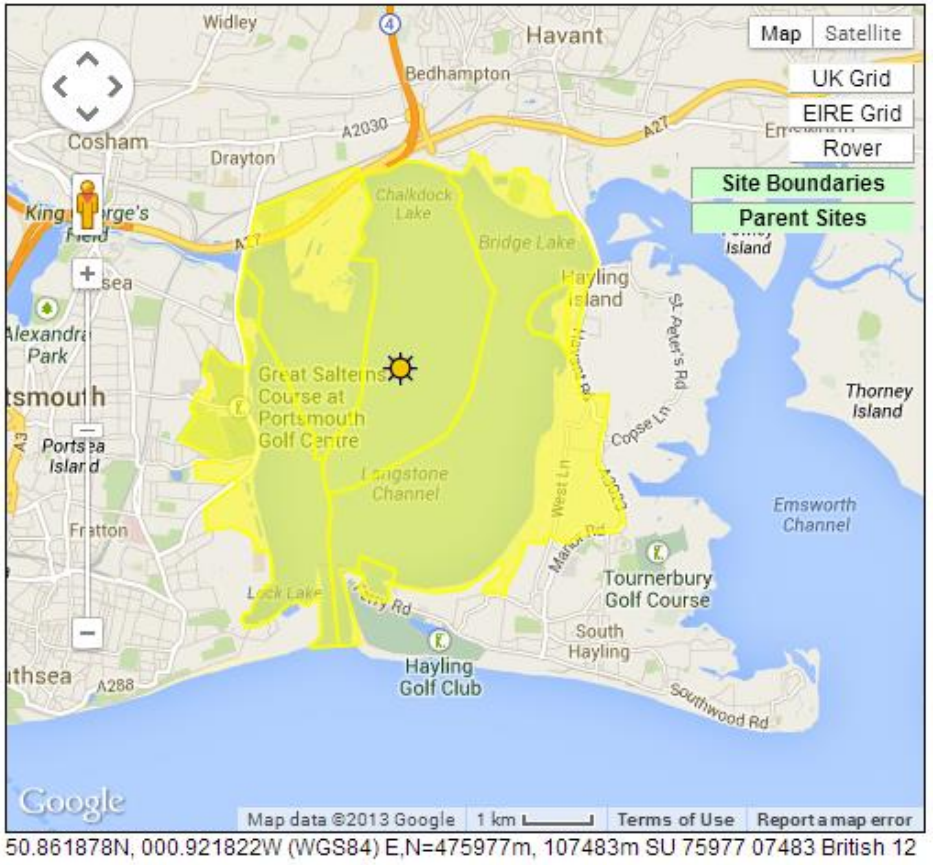

Figure 4.2: Langstone Harbour WeBS Survey Area

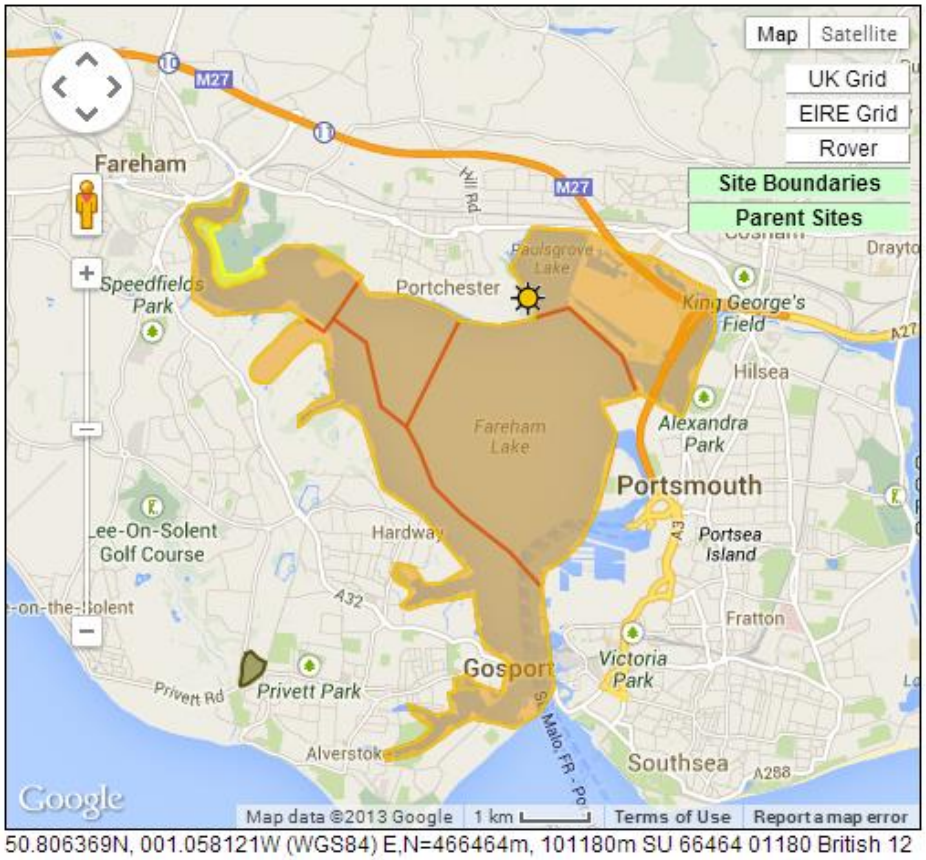

Figure 4.3: Portsmouth Harbour WeBS Survey Area

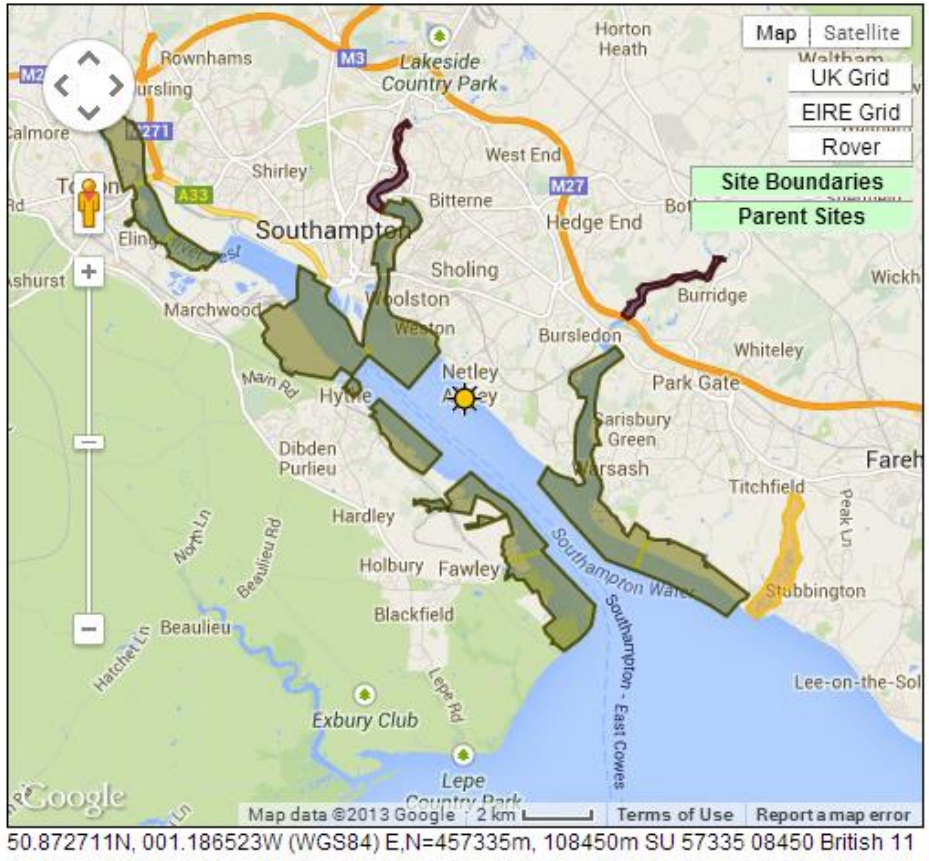

Figure 4.4: Southampton Water WeBS Survey Area

4.1.6 Of the sites being assessed by the HRA, the following support internationally important populations:

- Chichester and Langstone Harbours SPA 17,119 individuals representing up to 5.7% of the wintering Western Siberia/Western Europe population (5 year peak mean 1991/92-1995/96)
- Chichester and Langstone Harbours Ramsar 12,987 individuals, representing an average of 6% of the population (5 year peak mean 1998/9-2002/3)
- Portsmouth Harbour SPA: 2,847 individuals representing at least 0.9% of the wintering Western Siberia/Western Europe population (5 year peak mean 1991/2 - 1995/6)
- Portsmouth Harbour Ramsar: 2,105 individuals, representing an average of 2.1% of the GB population (5 year peak mean 1998/9-2002/3).
- Solent and Southampton Water SPA: 7,506 individuals representing at least 2.5% of the wintering Western Siberia/Western Europe population (5 year peak mean, 1992/3-1996/7).
- Solent and Southampton Water Ramsar: 6,456 individuals, representing an average of 3% of the population (5 year peak mean 1998/9-2002/3).

4.1.7 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 (IUCN 2013).

4.1.8 As shown in Table 4.1 Portsmouth Harbour, Chichester Harbour and Langstone Harbour are currently maintaining internationally important numbers of Dark-bellied Brent Geese (over 2,400 individuals). The average numbers recorded for Southampton fall below the threshold for an internationally important population, although they are still within the limits set for a nationally important population (910 individuals). It should be noted that this WeBS recording area does not include the Solent which forms a substantial part of the SPA.

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

	Year					
Survey Area	**06/07**	**07/08**	**08/09**	**09/10**	**10/11**	**Mean**
Portsmouth Harbour	3,162	(2,500)	2,538	(2,030)	2,054	2,585
Chichester Harbour	9,605	12,171	8,757	8,569	11,434	10,107
Langstone Harbour	4,906	5,263	4,165	3,846	3,947	4,425
Southampton Water	1,151	1,674	869	10,55[12]	1,649	1,280

(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 UK population of Dunlin is estimated at 532,000 individuals representing 30% of the biogeographic population (Rose and Scott 1997), 78% of which 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 non-breeding population size, of more than 50%, over 25 years, (or the longer-term).

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 Of the sites being assessed by the HRA, the following have been assessed as supporting internationally important populations:

- Portsmouth Harbour SPA; Dunlin *Calidris alpina alpina* (Northern Siberia/Europe/Western Africa) 5,123 individuals representing 1% of the population in Great Britain (5 year peak mean 1991/92-1995/96)
- Chichester and Langstone Harbours SPA; Dunlin *Calidris alpina alpina*, 44,294 individuals representing up to 3.2% of the wintering Northern Siberia/Europe/Western Africa population (5 year peak mean 1991/2 - 1995/6)

4.1.13 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 (IUCN 2013).

4.1.14 As shown in Table 4.2 Portsmouth Harbour is currently maintaining internationally important numbers of Dunlin (over 13,300 individuals). The average numbers recorded for Chichester Harbour fall below the threshold for an internationally important population, although they are still within the limits set for a nationally important population (over 3500 individuals). The lack of data from Southampton Water and Langstone Harbour is due to the fact that these two survey areas do not support nationally or internationally significant Dunlin populations.

Table 4.2: WeBS Core Count data for Dunlin

	Year					
Survey Area	**06/07**	**07/08**	**08/09**	**09/10**	**10/11**	**Mean**
Portsmouth Harbour	(6,592)	(7,002)	(6,842)	(6,530)	(4,182)	(7,002)
Chichester Harbour	14,152	(18,759)	26,311	17,465	16,658	18,669

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 UK population of Black-tailed Godwit is estimated at 7,410 individuals (Cayford & Waters 1996), representing 13% of the biogeographic population (Rose and Scott 1997), 100% of which 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 non-breeding population size, of more than 50%, over 25 years (or the longer-term).

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 Of the sites being assessed by the HRA, the following have been assessed as supporting internationally important populations:

- Portsmouth Harbour SPA; Black-tailed godwit *Limosa limosa islandica* (Iceland - breeding) 31 individuals, representing 0.4% of the population in Great Britain (5 year peak mean 1991/92-1995/96)

4.1.19 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 (IUCN 2013).

4.1.20 As shown in Table 4.3 Chichester Harbour is currently maintaining internationally important numbers of Black-tailed Godwit (over 610 individuals). The average numbers recorded for 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 430 individuals).

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

	Year					
Survey Area	**06/07**	**07/08**	**08/09**	**09/10**	**10/11**	**Mean**
Portsmouth Harbour	(398)	371	666[10]	(30)	(32)	519
Chichester Harbour	685	775	613	603	832	702
Langstone Harbour	562	674	422	574	705	587
Southampton Water	295	374	490	514	414	428

Red-breasted Merganser

4.1.21 Red-breasted Mergansers 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 UK population of Red-breasted Merganser is estimated at 10,000 individuals (Kirby 1995), representing 2% of the biogeographic population (Rose and Scott 1997), 19% of which occur within SPA sites for which the species is a qualifying feature. The species is a 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 Of the sites being assessed by the HRA, the following have been assessed as supporting internationally important populations:

- Portsmouth Harbour SPA; Red breasted merganser *Mergus serrator* (North-western/Central Europe) 87 individuals, representing 0.9% of the population in Great Britain 5 year peak mean 1991/92-1995/96
- Chichester and Langstone Harbours SPA; Red-breasted Merganser *Mergus serrator* 297 individuals, representing 3% of the population in Great Britain 5 year peak mean 1991/92-1995/96

4.1.25 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 (IUCN 2013).

4.1.26 As shown in Table 4.4 none of the sites are currently maintaining internationally important numbers of Red-breasted Merganser (over 1700 individuals). The average numbers recorded for Portsmouth Harbour, Langstone Harbour and Chichester Harbour are within (or very close to) the limits set for a nationally important population (over 84 individuals).

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

	Year					
Survey Area	**06/07**	**07/08**	**08/09**	**09/10**	**10/11**	**Mean**
Portsmouth Harbour	97	78	(89)	90	59	83
Chichester Harbour	217	211	157	253	213	210
Langstone Harbour	159	169	114	180[10]	137	152

Little Egret

4.1.27 The Little Egret *Egretta garzetta* has an extensive global breeding distribution that includes Europe, Africa, Asia and Australasia. Britain lies at the northern limit of the European breeding range. The Little Egrets that winter in the UK occur primarily on southern estuaries from Pembrokeshire in South Wales to the Thames. Individuals also occur away from this area, typically as autumn or spring vagrants. Those that occur in the non-breeding season in the UK may also include birds that originate from north-west France. There are also movements within Britain in the course of the non-breeding season.

4.1.28 The UK population of Little Egret is estimated at 500 individuals (JNCC 2013), representing just 0.2% of the biogeographic population (Rose and Scott 1997), 45% of which 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 localised breeding population.

4.1.29 The Little Egret is primarily an estuarine bird in the UK in winter, although it may also occur in freshwater habitats. Birds typically feed along muddy creeks and river channels; they are highly opportunistic feeders taking a variety of prey including fish, amphibians and invertebrates. Little Egrets typically roost in trees or saltmarsh with nocturnal roosts often being a considerable distance from foraging areas.

4.1.30 Of the sites being assessed by the HRA, the following have been assessed as supporting internationally important populations:

- Chichester and Langstone Harbours SPA; Little Egret *Egretta garzetta*, 137 individuals representing up to 17.1% of the on passage population in Great Britain (Count as at

1998), 100 individuals representing up to 20.0% of the wintering population in Great Britain (Count as at 1998)

4.1.31 The species is threatened by wetland degradation and habitat loss through drainage for agriculture (e.g. rice-farming and fishing), changes in current management practices (e.g. of rice-farming) and contamination from agricultural and industrial operations (IUCN 2013).

4.1.32 As shown in Table 4.5 none of the sites are currently maintaining internationally important numbers of Little Egrets (over 1300 individuals). However, all four survey areas are within the limits set for a nationally important population (over 45 individuals).

Table 4.5: WeBS Core Count data for Little Egret

	Year					
Survey Area	**06/07**	**07/08**	**08/09**	**09/10**	**10/11**	**Mean**
Portsmouth Harbour	96	111	49[11]	51	(81)	78
Chichester Harbour	192	264	267	198	219	228
Langstone Harbour	77	76	112	135	84	97
Southampton Water	80	(24)	(40)	(67)	(52)	80

Grey Plover

4.1.33 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.

4.1.34 The UK population of Grey Plover is estimated at 43,200 individuals (Cayford and Waters 1996), representing just 26% of the biogeographic population (Rose and Scott 1997), 90% of which 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.

4.1.35 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 (IUCN 2013).

4.1.36 In the UK there is evidence that the removal of Spartina anglica from tidal mudflats using herbicide is beneficial for the species (IUCN 2013).

4.1.37 Of the sites being assessed by the HRA, the following have been assessed as supporting internationally important populations:

- Chichester and Langstone Harbour SPA Grey Plover *Pluvialis squatarola*, 3,825 individuals representing up to 2.5% of the wintering Eastern Atlantic - wintering population (5 year peak mean 1991/2 - 1995/6)

4.1.38 As shown in Table 4.6none of the sites are currently maintaining internationally important numbers of Grey Plover (over 2500 individuals). However, both Chichester Harbour and Langstone Harbour are within the limits set for a nationally important population (over 430 individuals).

Table 4.6: WeBS Core Count data for Grey Plover

	Year					
Survey Area	**06/07**	**07/08**	**08/09**	**09/10**	**10/11**	**Mean**
Chichester Harbour	1,592	1,604	1,416	1,960	897	1,494
Langstone Harbour	702	848	989	820	825	837

Little Tern

4.1.39 The Little Tern 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.

4.1.40 The UK population of Little Tern is estimated at 2,400 pairs (Lloyd *et al* 1991), representing 8% of the biogeographic population (Rose and Scott 1997), 67% of which 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 because it is a species of European Concern, with a localised breeding population which has suffered a decline in its range.

4.1.41 Breeding occurs at scattered colonies around much of the coast of Britain and Ireland, from the north of Scotland to the south coast of England. All British and Irish Little Terns nest on the coast, utilising sand and shingle beaches and spits, as well as tiny islets of sand or rock close inshore. The greater part of the population occurs in south and east England from Hampshire to Norfolk (Lloyd *et al.* 1991). There are small, scattered colonies on the coasts of north-east and north-west England, eastern Scotland, the Outer and Inner Hebrides, and in Wales. The Irish population is mainly found on the west and south-east coasts. 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).

4.1.42 Of the sites being assessed by the HRA, the following have been assessed as supporting internationally important populations:

- Chichester and Langstone Harbours SPA Little Tern *Sterna albifrons*, 100 pairs representing up to 4.2% of the breeding population in Great Britain (5 year mean, 1992-1996)
- Chichester and Langstone Harbours Ramsar; Little Tern *Sterna albifrons*, 130 apparently occupied nests, representing an average of 1.1% of the breeding population
- Solent and Southampton Water SPA Little Tern *Sterna albifrons*, 49 pairs representing at least 2.0% of the breeding population in Great Britain (5 year peak mean, 1993-1997)
- Solent and Southampton Water Ramsar Little Tern *Sterna albifrons* 22 apparently occupied nests, representing an average of 1.1% of the GB population (Seabird 2000 Census)

4.1.43 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) It is also highly vulnerable to human disturbance (including birdwatchers) at coastal and inland nesting sites which can lead to nest failures. Pesticide pollution and artificially induced water-level fluctuations in saltmarshes may also pose a threat to the species' reproductive success.

4.1.44 No data is available for Chichester, Langstone and Portsmouth Harbours or for Southampton Water It should be noted that at the current time the recording of terns during WeBS surveys is optional.

Ringed Plover

4.1.45 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.

4.1.46 The UK population of breeding Ringed Plover is estimated at 8,500 pairs (Lloyd *et al* 1991). During the winter the UK supports 28,600 individuals representing 14% of the biogeographic population (Rose and Scott 1997), 21% of which occur within SPA sites for which the species is a qualifying feature. A further 30,000 birds will pass through the UK during winter migrations. This represents 30% of the biogeographic population. The species is not considered a species of European conservation concern but is a UK Amber listed Bird of Conservation Concern because of an important non-breeding population and a decline in breeding population.

4.1.47 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.

4.1.48 Of the sites being assessed by the HRA, the following have been assessed as supporting internationally important populations:

- Chichester and Langstone Harbours SPA; Ringed Plover *Charadrius hiaticula*, 846 individuals representing up to 1.7% of the wintering Europe/Northern Africa - wintering population (5 year peak mean 1991/2 - 1995/6)
- Solent and Southampton Water SPA; 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
- Chichester and Langstone Ramsar Ringed Plover *Charadrius hiaticula*, 853 individuals representing up to 1.1% of the wintering Europe/Northern Africa population (5 year peak mean 1998/9 - 2002/3)

4.1.49 The Chichester, Langstone and Portsmouth Harbours and Southampton Water did not meet table-qualifying levels for Ringed plover in the WeBS counts for 2010/11, as indicated by the absence of records.

Common Tern

4.1.50 The Common Tern 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.

4.1.51 The UK population of breeding Common Tern is estimated at 12,300 pairs (Gibbons *et al* 1993) which represents 4% of the biogeographic population (Rose and Scott 1997), 46% of which 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.

4.1.52 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.

4.1.53 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.

4.1.54 Of the sites being assessed by the HRA, the following have been assessed as supporting internationally important populations:

- Solent and Southampton Water SPA; Common tern *Sterna hirundo*, 267 pairs representing at least 2.2% of the breeding population in Great Britain (5 year peak mean, 1993-1997)
- Solent and Southampton Water Ramsar; Common tern *Sterna Hirundo* 192 apparently occupied nests, representing an average of 1.8% of the GB population (Seabird 2000 Census)
- Chichester and Langstone Harbour SPA; Common tern *Sterna hirundo*, 33 pairs, representing 0.3% of the breeding population in Great Britain (5 year mean, 1992-1996)

4.1.55 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 (IUCN 2013).

4.1.56 As shown in Table 4.7 none of the sites are currently maintaining internationally important numbers of Common Tern (over 1800 individuals). There are currently no British thresholds set for this species. However, Southampton Water exceeds the limits suggested by Holt (2012) for a nationally important population (over 200 individuals).

Table 4.7: WeBS Core Count data for Common Tern

	Year					
Survey Area	**06/07**	**07/08**	**08/09**	**09/10**	**10/11**	**Mean**
Southampton Water	(133)	(2)	(310)	(260)	(159)	(310)

Mediterranean Gull

4.1.57 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.

4.1.58 The UK population of breeding Mediterranean Gull is estimated at 31 pairs (Ogilvie *et al* 1996) which represents 0.1% of the biogeographic population (Rose and Scott 1997), 74% of which 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.

4.1.59 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 Non-breeding 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.

4.1.60 Of the sites being assessed by the HRA, the following have been assessed as supporting internationally important populations:

- Solent and Southampton Water Special Protection Area SPA; Mediterranean Gull *Larus melanocephalus* 2 pairs representing at least 20.0% of the breeding population in Great Britain (5 year peak mean, 1994-1998)
- Solent and Southampton Water Special Protection Area Ramsar Mediterranean Gull , *Larus melanocephalus,* 11 apparently occupied nests, representing an average of 10.1% of the GB population (Seabird 2000 Census)

4.1.61 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).

4.1.62 As shown in Table 4.8 none of the sites are currently maintaining internationally important numbers of Mediterranean Gull (over 770 individuals). Southampton water and Chichester and Portsmouth Harbours both exceed the threshold set for sites of national importance (18 individuals).

Table 4.8: WeBS Core Count data for Mediterranean Gull

	Year					
Survey Area	**06/07**	**07/08**	**08/09**	**09/10**	**10/11**	**Mean**
Southampton Water	(112)	(309)	(30)	(36)	628	628
Chichester Harbour	12	(31)	28	(56)	(61)	38
Portsmouth Harbour	11	(12)	29	(22)	(10)	18

Roseate Tern

4.1.63 The global distribution of Roseate Tern 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.

4.1.64 The UK population of breeding Roseate Terns is estimated at 64 pairs (Stone *et al* 1997) which represents 3% of the biogeographic population (Rose and Scott 1997), 88% of which are found 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 an Amber listed Bird of Conservation Concern in the UK due to a recent decline in the breeding population.

4.1.65 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.

4.1.66 Of the sites being assessed by the HRA, the following have been assessed as supporting internationally important populations:

- Solent and Southampton Water SPA Roseate Tern *Sterna dougalli* 2 pairs representing at least 3.3% of the breeding population in Great Britain (5 year peak mean, 1993-1997)
- Solent and Southampton Water Ramsar Roseate Tern *Sterna dougallii* 1 apparently occupied nests, representing an average of 1.9% of the GB population (Seabird 2000 Census)

4.1.67 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).

4.1.68 No data is available for any of the four survey areas. It should be noted that at the current time the recording of terns during WeBS surveys is optional.

Teal

4.1.69 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.

4.1.70 The UK population of Teal is estimated at 135,000 (Kirby 1995) which represents 17% of the biogeographic population (Rose and Scott 1997), 47% of which are found within SPA sites for which this species is a qualifying feature. It is also estimated that 2100 pairs of breeding birds are resident in the UK (BTO 2013). 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.

4.1.71 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.

4.1.72 Of the sites being assessed by the HRA, the following have been assessed as supporting internationally important populations:

- Solent and Southampton Water SPA; 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)

- Solent and Southampton Water Ramsar; Teal *Anas crecca* 5,514 individuals, representing an average of 1.3% of the population (5 year peak mean 1998/9-2002/3)
- Chichester and Langstone Harbours SPA; Teal *Anas crecca* 1,824 individuals, representing 0.5% of the population 5 year peak mean 1991/92-1995/96

4.1.73 This species is threatened by lowland habitat loss and degradation. It is also threatened by disturbance from human recreational activities and construction work (IUCN 2013). Chichester, Langstone and Portsmouth Harbours and Southampton Water did not meet table-qualifying levels for Eurasian Teal in the WeBS counts for 2010/11, as indicated by the lack of records

Redshank

4.1.74 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.

4.1.75 The UK population of Redshank is estimated at 114,000 (Cayford and Waters 1996) which represents approximately 38% of the biogeographic population (Rose and Scott 1997), 48% of which are found within SPA sites for which this species is a qualifying feature. It is also estimated that 30,600 pairs of breeding birds are resident in the UK (JNCC 2013) and that there is significant intermingling between breeding and non-breeding birds within flocks. 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.

4.1.76 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.

4.1.77 Of the sites being assessed by the HRA, the following have been assessed as supporting internationally important populations:

- Chichester and Langstone harbour SPA; Redshanks *Tringia totanus* 1,788 individuals, representing 1% of the Eastern Atlantic wintering population (5 year peak mean 1991/92-1995/96)
- Chichester and Langstone harbour Ramsar; Redshanks *Tringia totanus* 2,577 individuals, representing an average of 1% of the population (5 year peak mean 1998/9-2002/3)

4.1.78 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 (IUCN 2013)

4.1.79 As shown in Table 4.9 Chichester Harbour was the only site where nationally important numbers of Redshank (over 1200 individuals) were recorded, levels for internationally significant populations are set at 2400 individuals.

Table 4.9: WeBS Core Count data for Redshank

	Year					
Survey Area	**06/07**	**07/08**	**08/09**	**09/10**	**10/11**	**Mean**
Chichester Harbour	(2,535)	2,403	1,810	2,028	1,873	2,130

Shelduck

4.1.80 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.

4.1.81 The UK population of overwintering Shelduck is estimated at 73,500 individuals (Stone *et al* 1997) which represents 22% of the biogeographic population (Rose and Scott 1997), 84% of which 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.

4.1.82 Non-breeding Shelduck in the UK are part of the north-west European population, which comprises 300,000 individuals (Rose & Scott 1997). 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).

4.1.83 Of the sites being assessed by the HRA, the following have been assessed as supporting internationally important populations:

- Chichester and Langstone Harbours SPA; Shelduck *Tadorna tadorna* 2,410 individuals, representing 3.3% of the population in Great Britain (5 year peak mean 1991/92-1995/96)
- Chichester and Langstone Harbours Ramsar; Common Shelduck *Tadorna tadorna* 1,468 individuals, representing an average of 1.8% of the GB population (5 year peak mean 1998/9-2002/3)

4.1.84 As shown in Table 4.10 Chichester Harbour was the only site where nationally important numbers of Redshank (over 610 individuals) were recorded during WeBS surveys, levels for internationally significant populations are set at 3000 individuals.

Table 4.10: WeBS Core Count data for Shelduck

	Year					
Survey Area	**06/07**	**07/08**	**08/09**	**09/10**	**10/11**	**Mean**
Chichester Harbour	643	449	560	926	638	643

Eurasian Curlew

4.1.85 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.

4.1.86 The UK population of overwintering Curlew is estimated at 115,000 (Cayford and Waters 1996) which represents approximately 14% of the biogeographic population (Rose and Scott 1997), 38% of which are found within SPA sites for which this species is a qualifying feature. It is also estimated that 33,000 pairs of breeding birds are resident in the UK (JNCC 2013). 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 breeding and non-breeding populations and a recent decline in the breeding population.

4.1.87 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 muddy coasts, bays and estuaries and saltmarshes. It also utilises wet grassland and arable fields during migration. 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.

4.1.88 Of the sites being assessed by the HRA, the following have been assessed as supporting internationally important populations:

- Chichester and Langstone Harbours SPA; Curlew *Numenius arquata* 1,861 individuals, representing 1.6% of the population in Great Britain (5 year peak mean 1991/92-1995/96)

4.1.89 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. 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.

4.1.90 As shown in Table 4.11 Chichester Harbour was the only site where nationally important numbers of Redshank (over 1400 individuals) were recorded during WeBS surveys, although similar numbers were recorded in some years at Langstone Harbour. Levels for internationally significant populations are set at 8400 individuals.

Table 4.11: WeBS Core Count data for Eurasian Curlew

	Year					
Survey Area	**06/07**	**07/08**	**08/09**	**09/10**	**10/11**	**Mean**
Chichester Harbour	2,052	1,760	1,481	1,763	1,685	1,748
Langstone Harbour	1,343	1,279	1,228	1,469	1,506	1,365

Bar-tailed Godwit

4.1.91 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.

4.1.92 The UK population of Bar-tailed Godwit is estimated at 52,500 (Cayford and Waters 1996) which represents approximately 39% of the biogeographic population (Rose and Scott 1997), 70% of which 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.

4.1.93 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.

4.1.94 Of the sites being assessed by the HRA, the following have been assessed as supporting internationally important populations:

- Chichester and Langstone Harbours SPA 1,692 individuals representing up to 3.2% of the wintering population in Great Britain (5 year peak mean 1991/2 - 1995/6)

4.1.95 The species is threatened by the degradation of foraging sites due to land reclamation, pollution and human disturbance. In the UK there is evidence that the removal of *Spartina anglica* from tidal mudflats using a herbicide is beneficial for the species.

4.1.96 As shown in Table 4.12Langstone Harbour did not meet table-qualifying levels for Bar-tailed Godwit in the WeBS counts for 2010/11, as indicated by the lack of records. The numbers for Chichester Harbour have been below the threshold set for an internationally important population for the last three years although they were met in the 2007 to 2008 recording period.

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

	Year					
Survey Area	**06/07**	**07/08**	**08/09**	**09/10**	**10/11**	**Mean**
Chichester Harbour	630	1228	802	1006	890	911

Shoveler

4.1.97 The Shoveler *Anas clypeata* has an extensive global distribution, breeding at northern latitudes throughout both Eurasia and North America.

4.1.98 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.

4.1.99 The UK population of overwintering Shoveler is estimated at 10,000 (Kirby 1995) which represents approximately 9% of the biogeographic population (Rose and Scott 1997), 35% of which are found within SPA sites for which this species is a qualifying feature. It is also estimated that 1000 pairs of breeding birds are resident in the UK (JNCC 2013). 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.

4.1.100 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.

4.1.101 As with many migratory birds, there is a high turnover of Shoveler passing through Britain, with the overall numbers, which vary considerably from year to year, likely to be more than the estimated British population of 10,000 (Kirby 1995a). 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).

4.1.102 Of the sites being assessed by the HRA, the following have been assessed as supporting internationally important populations:

- Chichester and Langstone Harbours SPA; Shoveler *Anas clypeata,* 100 individuals, representing 1% of the population in Great Britain (5 year peak mean 1991/92-1995/96)

4.1.103 None of the four survey areas met mean average table-qualifying levels for Shoveler in the WeBS counts for 2010/11, as indicated by the absence of records. These are set at 400

individuals for a site of international importance and 180 individuals for a site of national importance.

Pintail

4.1.104 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.

4.1.105 The UK population of Bar-tailed Godwit is estimated at 27,800 (Kirby 1995) which represents approximately 32% of the biogeographic population (Rose and Scott 1997), 67% of which 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.

4.1.106 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.

4.1.107 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.

4.1.108 Of the sites being assessed by the HRA, the following have been assessed as supporting internationally important populations:

- Chichester and Langstone Harbours SPA; Pintail *Anas acuta,* 330 individuals, representing 1.2% of the population in Great Britain 5 year peak mean 1991/92-1995/96

4.1.109 The species is threatened by wetland habitat loss on its breeding and wintering grounds (Scott and Rose 1996). Reclamation of coastal areas for industrial development poses a threat in Europe.

4.1.110 None of the WeBS survey areas met mean average table-qualifying levels for Pintail in the WeBS counts for 2010/11, as indicated by the absence of records. These are set at 600 individuals for a site of international importance and 290 individuals for a site of national importance.

Turnstone

4.1.111 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.

4.1.112 The UK population of Turnstone is estimated at 64,400 (Cayford and Waters 1996) which represents approximately 15% of the biogeographic population (Rose and Scott 1997), only 13% of which are found within the SPA suite. 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.

4.1.113 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.

4.1.114 Of the sites being assessed by the HRA, the following have been assessed as supporting internationally important populations:

- Chichester and Langstone Harbours SPA; Turnstone *Arenaria interprens* 430 individuals, representing 0.7% of the population in Great Britain (5 year peak mean 1991/92-1995/96)

4.1.115 As shown in Table 4.13 Langstone Harbour did not meet table-qualifying levels for nationally important numbers of Turnstone in the WeBS counts for 2010/11 (set at 480 individuals). However, they were met in the 2007 to 2008 and 2008 to 2009 recording periods. The survey areas at Chichester and Portsmouth Harbours and Southampton Water did not meet table qualifying levels.

Table 4.13: WeBS Core Count data for Turnstone

	Year					
Survey Area	**06/07**	**07/08**	**08/09**	**09/10**	**10/11**	**Mean**
Langstone Harbour	450	488	550	299	415	440

Wigeon

4.1.116 The global distribution of the Wigeon 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.

4.1.117 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.

4.1.118 The UK population of overwintering Wigeon is estimated at 277,800 (Kirby 1995) which represents approximately 18% of the biogeographic population (Rose and Scott 1997), 79% of which are found within SPA sites for which this species is a qualifying feature. It is also estimated that 300 pairs of breeding birds are resident in the UK (JNCC 2013). 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.

4.1.119 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.

4.1.120 Of the sites being assessed by the HRA, the following have been assessed as supporting internationally important populations:

- Chichester and Langstone Harbours SPA; Eurasian wigeon *Anas penelope* 2,055 individuals, representing 0.7% of the population in Great Britain (5 year peak mean 1991/92-1995/96)

4.1.121 This species is susceptible to disturbance from freshwater recreational activities, pollution, wetland drainage and changing wetland management practices (IUCN 2013).

4.1.122 None of the WeBS survey areas met mean average table-qualifying levels for Wigeon in the WeBS counts for 2010/11, as indicated by the absence of records. These are set at 15,000 individuals for a site of international importance and 4,400 individuals for a site of national importance.

Nightjar

4.1.123 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.

4.1.124 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.

4.1.125 The UK breeding population of Nightjar is estimated by surveying the numbers of male birds heard 'churring' (calling) and is around 3,400 males (Morris *et al* 1994). This represents 0.8% of the biogeographic population. The SPA suite currently supports 53% of the UK population. The species is considered depleted and of most conservation concern in Europe, it is a Red listed Bird of Conservation Concern in the UK due to a recent decline in breeding range.

4.1.126 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.

4.1.127 Of the sites being assessed by the HRA, the following have been assessed as supporting internationally important populations:

- New Forest SPA; Nightjar *Caprimulgus europaeus*, 300 pairs representing at least 8.8% of the breeding population in Great Britain

4.1.128 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 4.14 shows the percentage of Nightjars which are supported by the New Forest SPA.

Table 4.14: Distribution of Nightjars within SPA in Britain (JNCC, 2001)

Site Name	Site Total	% of Biogeographical Population	% of GB Population
Ashdown Forest	35	<0.1 1	1.0
Breckland	415	0.2	12.2
Dorset Heathland	386	0.2	11.4
East Devon Heaths	83	<0.1	2.4
Minsmere – Walberswick	24	<0.1	0.7
New Forest	300	0.1	8.8
Sandlings	109	<0.1	3.2
Thames Basin Heaths	264	0.1	7.8
Thorne and Hatfield Moors	66	<0.1	1.9
Wealden Heaths	103	<0.1	3.0

Woodlark

4.1.129 Woodlarks *Lullula arborealis* are widely distributed across Europe from Iberia to the Russian steppes but have 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.

4.1.130 The UK population of breeding Woodlark is estimated at 1,500 pairs (Wotton & Gillings 2000) which represents 0.1% of the biogeographic population (Hagemeijer & Blair 1997), 73% of which are found within SPA sites for which this species is a qualifying feature. The species is considered depleted and of most conservation concern in Europe, it is an Amber listed Bird of Conservation Concern in the UK due to a recent decline in breeding range and a localised breeding population.

4.1.131 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.

4.1.132 Of the sites being assessed by the HRA, the following have been assessed as supporting internationally important populations:

- New Forest SPA; Woodlark *Lullula arborea*, 184 pairs representing at least 12.3% of the breeding population in Great Britain (Count as at 1997)

4.1.133 Table 4.15 shows the percentage of Woodlarks which are supported by the New Forest SPA.

Table 4.15: Distribution of Woodlarks within SPA in Britain (JNCC, 2001)

Site Name	Site Total	% of Biogeographical Population	% of GB Population
Breckland	430	<0.1	28.7
Dorset Heathland	60	<0.1	4.0
Minsmere – Walberswick	20	<0.1	1.3
New Forest	184	<0.1	12.3
Sandlings	154	<0.1	10.3
Thames Basin Heaths	149	<0.1	9.9
Wealden Heaths	105	<0.1	7.0

Honey Buzzard

4.1.134 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.

4.1.135 The UK population of breeding Honey Buzzard is estimated at 19 pairs (Wotton & Gillings 2000) which represents 0.1% of the biogeographic population (Hagemeijer & Blair 1997), 13% of which 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.

4.1.136 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, (The New Forest SPA supports 2 pairs representing 13% of the UK population JNCC 2001), 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.

4.1.137 Of the sites being assessed by the HRA, the following have been assessed as supporting internationally important populations:

- New Forest SPA; Honey Buzzard *Pernis apivorus*, 2 pairs representing at least 10.0% of the breeding population in Great Britain

Dartford Warbler

4.1.138 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.

4.1.139 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.

4.1.140 The UK population of breeding Dartford Warbler is estimated at 1,600 pairs (Gibbons and Wotton 1996) which represents 0.1% of the biogeographic population (Hagemeijer & Blair 1997), 100% of which 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.

4.1.141 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.

4.1.142 Of the sites being assessed by the HRA, the following have been assessed as supporting internationally important populations:

- New Forest SPA; Dartford Warbler *Sylvia undata*, 538 pairs representing at least 33.6% of the breeding population in Great Britain

4.1.143 Table 4.16 shows the percentage of Dartford Warblers which are supported by the New Forest SPA.

Table 4.16: Distribution of Dartford Warblers within SPA in Britain (JNCC, 2001)

Site Name	Site Total	% of Biogeographical Population	% of GB Population
Ashdown Forest	29	<0.1	1.8
Dorset Heathland	418	<0.1	26.1
East Devon Heathlands	128	<0.1	8.0
New Forest	538	<0.1	33.6
Thames Basin Heaths	445	<0.1	27.8
Wealden Heaths	123	<0.1	7.7

Hen Harrier

4.1.144 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.

4.1.145 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.

4.1.146 The UK population of overwintering Hen Harrier is estimated at 750 individuals (Lack 1986) which represents approximately 1% of the biogeographic population (Hagermeyer and Blair 1997), 33% of which are found within SPA sites for which this species is a qualifying feature. It is also estimated that 483 pairs of breeding birds are resident in the UK (JNCC 2013). The New Forest population is considered to be overwintering and 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.

4.1.147 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.

4.1.148 Of the sites being assessed by the HRA, the following have been assessed as supporting internationally important populations:

- New Forest SPA; 15 individuals representing at least 2.0% of the wintering population in Great Britain

4.1.149 Table 4.17 shows the percentage of Hen Harriers which are supported by the New Forest SPA.

Table 4.17: Distribution of Hen Harriers within SPA in Britain (JNCC, 2001)

Site Name	Site Total	% of Biogeographical Population	% of GB Population
Blackwater Estuary	4	<0.1	0.5
Broadland	22	<0.1	2.9
Colne Estuary	4	<0.1	0.5
Dengie	5	<0.1	0.7
Dorset Heathlands	20	<0.1	2.7
Foulness	6	<0.1	0.8
Humber Flats, Marshes and Coast	20	<0.1	2.7
Loch of Inch and Torrs Warren	8	<0.1	1.1
Minsmere - Walberswick	15	<0.1	2.0
Muirkirk and North Lowther Uplands	10	<0.1	1.3
New Forest	15	<0.1	2.0
North Norfolk Coast	16	<0.1	2.1
Orkney Mainland Moors	13	<0.1	1.7

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[7] together with a review of other available literature on the behaviour and ecology of these species.

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

Southern Damselfly

4.2.2 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 side-channels of chalk rivers. Most sites are on wet heath.

4.2.3 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 hundreds 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.

Stag Beetle

4.2.6 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.

4.2.7 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.

4.2.8 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).

Great Crested Newt

4.2.9 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.

4.2.10 The Great Crested Newt 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.

4.2.11 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).

Bullhead

4.2.12 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.

4.2.13 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.

White-clawed Crayfish

4.2.14 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.

4.2.15 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.

4.2.16 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).

Brook Lamprey

4.2.17 The Brook Lamprey *Lampetra planeri* is a primitive, jawless fish resembling an eel, and is the smallest of the lampreys found in the UK. 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.

4.2.18 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.

Otter

4.2.19 The otter *Lutra lutra* is a semi-aquatic mammal, which occurs in a wide range of ecological conditions, including inland freshwater and coastal areas (particularly in Scotland). Inland populations utilise a range of running and standing freshwaters. These must have an abundant supply of food (normally associated with high water quality), together with suitable habitat, such as vegetated river banks, islands, reedbeds and woodland, which are used for foraging, breeding and resting.

4.2.20 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).

4.2.21 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).

Atlantic Salmon

4.2.22 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.

4.2.23 The Atlantic salmon is a widespread species in the UK and is found in several hundred rivers, many of which have adult runs in excess of 1000. The latest estimates of the UK spawning population size (ICES 2000) are, however, about 50% down on the ten-year average. This decrease could be due to a number of factors 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.

4.3 Qualifying Habitats of Special Areas of Conservation

4.3.1 The following accounts are adapted from the JNCC site descriptions of the four SACs (New Forest, Butser Hill, River Itchen and Solent Maritime), which are considered in the HRA[8].

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

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

4.3.2 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

4.3.3 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

4.3.4 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

4.3.5 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)

4.3.6 The New Forest represents *Molinia* meadows in southern England. 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

4.3.7 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)

4.3.8 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

4.3.9 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

4.3.10 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

4.3.11 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

4.3.12 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. In other places there are transitions to Old acidophilous oak woods with *Quercus robur* on sandy plains and Atlantic acidophilous beech forests with *Ilex* and sometimes also *Taxus* in the shrublayer (*Quercion robori-petraeae* or *Ilici-Fagenion*), for which this site has also been selected.

Transition mires and quaking bogs

4.3.13 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'.

4.3.14 The following NVC communities form the core of transition mire vegetation in the UK:

- M4 *Carex rostrata – Sphagnum recurvum* mire
- M5 *Carex rostrata – Sphagnum squarrosum* mire
- M8 *Carex rostrata – Sphagnum warnstorfii* mire
- M9 *Carex rostrata – Calliergon cuspidatum/giganteum* mire
- S27 *Carex rostrata – Potentilla palustre* tall-herb fen

4.3.15 However this is not an exhaustive list and numerous other communities form important components of some mire sites.

Alkaline fens

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

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

4.3.17 At most sites there are well-marked transitions to a range of other fen vegetation, predominantly, but not exclusively, to M14 *Schoenus nigricans – Narthecium ossifragum* mire and S24 *Phragmites australis – Peucedanum palustre* tall-herb fen in the lowlands.

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

4.3.18 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

4.3.19 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

4.3.20 The Itchen is a classic example of a sub-type 1 chalk river. The river is dominated throughout by aquatic *Ranunculus spp*. The headwaters contain pond water-crowfoot *Ranunculus peltatus*, while two *Ranunculus* species occur further downstream: stream water-crowfoot *R. penicillatus ssp. pseudofluitans*, a species especially characteristic of calcium-rich rivers, and river water-crowfoot *R. fluitans*.

Estuaries

4.3.21 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-buil 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)

4.3.22 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)

4.3.23 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

4.3.24 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.

4.3.25 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

4.3.26 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.

Coastal Lagoons Priority feature

4.3.27 Coastal lagoons are areas of shallow, coastal salt water, wholly or partially separated from the sea by sandbanks, shingle or, less frequently, rocks. Lagoons show a wide range of

geographical and ecological variation; five main sub-types have been identified in the UK, on the basis of their physiography, as meeting the definition of the Annex I habitat type; Isolated lagoons, percolation lagoons, silled lagoons, sluiced lagoons and lagoonal inlets.

Annual vegetation of drift lines

4.3.28 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.

4.3.29 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

4.3.30 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

4.3.31 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.

4.3.32 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`)

4.3.33 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 Identifying Impact Pathways

5.1 Introduction

5.1.1 The screening assessment for Welborne found that European sites in the area were likely to be significantly affected via a range of impact pathways. These are summarised in Table 5.1. The following sections provide information on how the identified impact pathways could adversely affect the European sites.

Table 5.1: European sites subject to likely significant effects

Impact pathway	Sites affected
Atmospheric pollution	Butser Hill SAC New Forest SAC/SPA/Ramsar River Itchen SAC Solent Maritime SAC Chichester & Langstone Harbours SPA/Ramsar Portsmouth Harbour SPA/Ramsar Solent and Southampton Water SPA/Ramsar
Disturbance	Chichester & Langstone Harbours SPA/Ramsar New Forest SPA Portsmouth Harbour SPA/Ramsar Solent and Southampton Water SPA/Ramsar
Effects on supporting habitats	Chichester & Langstone Harbours SPA/Ramsar Portsmouth Harbour SPA/Ramsar Solent and Southampton Water SPA/Ramsar
Impacts related to water abstraction and supply	River Itchen SAC
Impacts related to waste water treatment & discharge	Solent Maritime SAC Solent and Southampton Water SPA/Ramsar

5.2 Atmospheric Pollution

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

5.2.2 The main pollutant effects of interest are acid deposition and eutrophication by nitrogen deposition. The following brief descriptions draw on information presented through the Air Pollution Information System[9] (APIS).

5.2.3 Acid deposition: caused by oxides of nitrogen (NO_X) (or sulphur dioxide) reacting with rain/cloudwater to form nitric (or sulphuric) acid, and is caused primarily by energy generation, as well as road traffic and industrial combustion. Both wet and dry acid deposition have been implicated in the damage and destruction of vegetation (heather, mosses, liverworts and lichens are particularly susceptible to cell membrane damage due to excessive pollutant levels) and in the degradation of soils and watercourses (including acidification and reduced microbial activity).

5.2.4 Eutrophication by nitrogen deposition: consists of the input of nitrogen from NO_X (and sometimes ammonia) emissions by deposition, and is caused primarily by road traffic, as well as energy generation, industrial combustion and agricultural practices. Nitrogen deposition can cause direct damage to heather, mosses, liverworts and lichens, as well as other plant species, because of their sensitivity to additional atmospheric nitrogen inputs, whilst deposition can also 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)).

5.2.5 Furthermore, while plants are able to detoxify and assimilate low exposure to atmospheric concentrations of NO_X, high levels of uptake can lead to detrimental impacts including:

- Inhibition of pigment biosynthesis, leading to reduced rates of photosynthesis;
- Water soaking as NO_2 molecules attach to lipids in membranes, causing plasmolysis (removal of water) and eventually necrosis;
- Inhibition of lipid biosynthesis, leading to reduced rates of regeneration and growth;
- Injury to mitochondria and plastids, essential to internal processing of energy & proteins;
- Decrease in stomatal conductance of air and water vapour; and
- Inhibition of carbon fixation (at least under low light levels).

5.2.6 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 residential and commercial developments will therefore be the focus of this part of the assessment. The scope can be further refined by concentrating on traffic growth on roads within 200m of European sites, as beyond 200m effects of emissions from this source diminish to the equivalent of background levels (Laxen & Wilson (2002).

[9] Online at: http://www.apis.ac.uk/index.html [Accessed 17/10/12]

Baseline conditions

5.2.7 A Partnership for Urban South Hampshire (PUSH) research report (AEAT, 2010) notes that the critical load or level for each of these pollutant classes is already exceeded or approaching exceedance at background locations, away from roads across large parts of the sub-region. Nilsson and Grennfelt (1988) define critical loads and levels as "*a quantitative estimate of exposure to one or more pollutants below which significant harmful effects on specified sensitive elements of the environment do not occur according to present knowledge*". 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).

5.2.8 The Baseline Data Review Report presented data available through APIS on background critical load/level exceedances for acidification, nutrient N and NOx at key locations where parts of the strategic road network pass through or within 200 metres of the European sites under consideration; see Appendix III. A selection of grid references within European sites on or close to the road network connecting to Welborne were chosen to interrogate APIS (Figure 5.1) because beyond 200m effects from road sources diminish to the equivalent of background levels (Laxen & Wilson (2002), DfT (2005)).

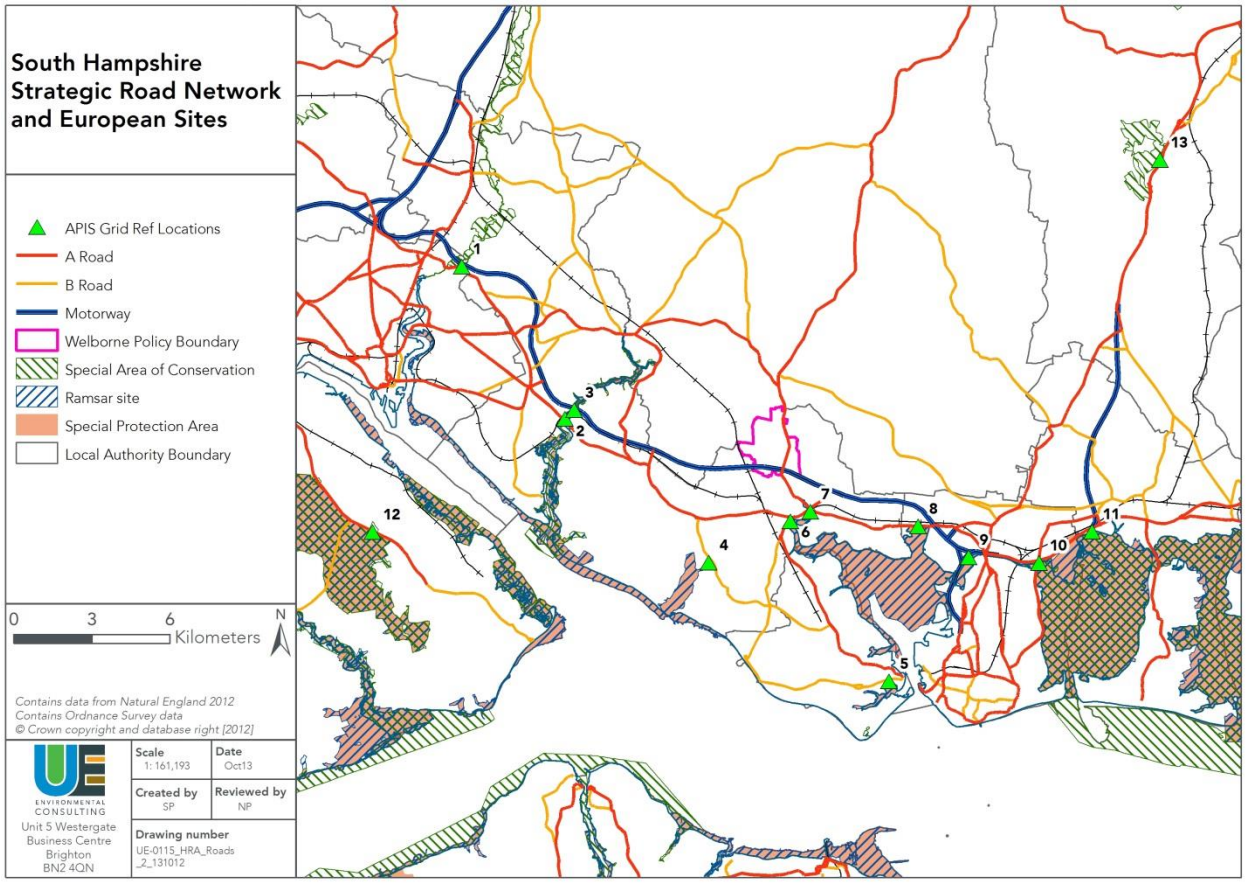

Figure 5.1: APIS Grid Reference Locations, European Sites, Strategic Road Network

5.2.9 For each grid reference, the actual and critical load/level was obtained for acid deposition, nutrient deposition and NOx in relation to a representative qualifying habitat type, or closest available match thereto, within European sites of interest (Butser Hill, New Forest, River Itchen and Solent Maritime SACs; Chichester and Langstone Harbours, Portsmouth Harbour, Solent and Southampton Water and New Forest SPAs/Ramsars). Cells shaded in red indicate an exceedance, whereas those shaded in amber indicate that the background load/level is more than 70% the critical load/level i.e. it is approaching exceedance. As can be seen, all sites have an exceedance for at least one of the selected grid reference locations / pollution types, except for Portsmouth Harbour SPA/Ramsar and Solent and Southampton Water SPA/Ramsar which are approaching exceedance.

Predicted traffic growth

5.2.10 The Design Manual for Roads and Bridges (DMRB; Highways Agency, 2007) provides guidance on assessing the impact that road projects may have on local air quality. Specific provision is made in relation to sites designated under the Habitats Directive. In this instance the assessment is in relation to existing, as opposed to new roads, however the guidance clarifies that '*where appropriate, the advice may be applied to existing roads*'. DMRB provides a scoping assessment for local air quality and initially requires the identification of roads which are likely to be affected by the proposals. The criteria for defining an affected road are:

- Road alignment will change by 5 metres or more; or
- Daily traffic flows will change by 1,000 annual average daily traffic (AADT) or more; or
- Heavy Duty Vehicle (HDV) flows will change by 200 AADT or more; or
- Daily average speed will change by 10km/hr or more; or
- Peak hour speed will change by 20km/hr or more.

5.2.11 The scoping assessment then requires that nature conservation sites (e.g. SAC/SPA/Ramsar) within 200m of the road and their characteristics be identified. The guidance states that if none of the roads in the network meet the traffic/alignment criteria (that is, they are not affected roads) or there are no relevant designated sites near the affected roads, then the impact of the scheme can be considered neutral in terms of local air quality and no further work is needed.

5.2.12 The Council commissioned specific model runs within the South Hampshire Sub-regional Transport Model (SRTM) (MVA, December 2013) to explore potential future growth in traffic associated with the Welborne Plan. Several iterations of transport modelling have been undertaken to inform development of the Welborne Plan. The following sections report the findings of Sub-Regional Transport Model run 8b as this is believed to most closely represent the Council's preferred options.

5.2.13 Within the model, development is assumed to consist of (up to) 6,500 dwellings and 112,000 square metres of employment land use. The SRTM has been used to assess the impact of the development and to assist with the identification of the appropriate transport strategy for the development for a forecast year of 2036. It is anticipated that residential developments will be complete by 2036 but that employment development may continue until 2041, whereas the final

transport model year in SRTM is 2036. The full 2041 development quantum has been run with the 2036 transport model to ensure the full quantum of development is replicated.

5.2.14 In accordance with guidance three weekday periods are modelled in the SRTM:

- AM peak: busiest hour between 0700 and 1000, (defined as 38.2% of the three hours for Highway and 40% for Public Transport);
- Inter peak: average of 1000 to 1600 (i.e. 16.7% of the six hours for both modes); and
- PM peak: busiest hour between 1600 and 1900, (defined as 35.8% of the three hours for Highway and 40% for Public Transport).

5.2.15 In early 2013 a re-validation exercise was undertaken on the SRTM with a prime objective to improve highway link flow validation on the strategic highway network including on the M27 in the vicinity to the proposed Welborne site. The re-validation work incorporated traffic data provided post original model development (2010) and advancements/ best practice in the coding of specific highway and junction arrangements.

5.2.16 The SRTM model represents conditions up to the year 2036. Known developments and committed highway schemes are included within the models' reference case scenarios (2014, 2019, 2026, 2031 and 2036) to provide the most accurate representation of future year conditions. A list of the known developments and committed highway schemes included in the Reference Cases is provided in MVA 2013, Appendix B.

5.2.17 Welborne land use assumptions were defined by the Council as follows:

- Year: 2036;
- Dwellings: 6,500;
- Employment: 112,000m^2 (B1: 30,000 m^2; B2: 35,000 m^2; B8: 40,000 m^2; A1: 7,000 m^2); and
- Schools: four.

5.2.18 Highway and public transport assumptions for run 8b were:

- Year: 2036;
- Highway (see Figure 5.2):
  - Roundabout from M27 J10 onto A32,
  - 4 Welborne site access on A32 (4 roundabouts),
  - New on/off slips on M27 west of J10 and dumbbells under bridge,
  - Additional lane SB through M27 underpass and signals on approach arm,
  - New WB off slip at J10 providing access to west of development (replacing existing off-slip with direct link to A32);
- Public transport:
  - All existing A32 Bus services to divert in to Welborne,
  - BRT from Welborne to Gosport,

- BRT from Welborne to Portsmouth via A27, and
- BRT from Welborne to Portsmouth via M27 J10 (Fast Track).

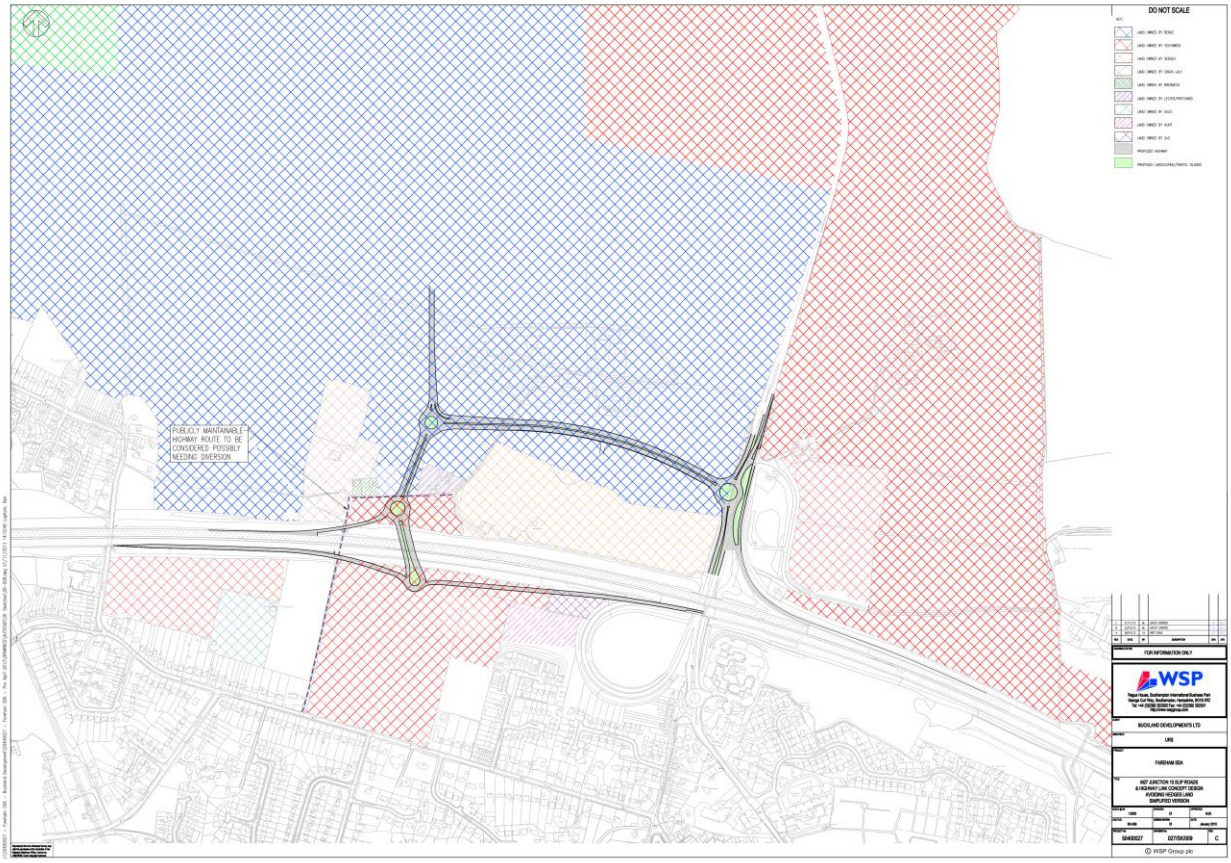

Figure 5.2: Highways arrangement for SRTM run 8b (Source: MVA, 2013, Appendix C)

5.2.19 Run 8b outputs are compared against run 1, which is a modelled representation of the changing baseline situation between 2010 and 2036. Predicted traffic flow figures for the AM peak, PM peak and inter-peak hours were converted to Annual Average Daily Traffic (AADT) flow format for use with reference to the DMRB guidance; see Appendix IV. MVA supplied specific data for road links passing within 200m of European sites in and around Fareham borough, as shown in Figure 5.3.

5.2.20 The data presented in Appendix IV show that in the majority of cases traffic flows will either decrease or increase by less than 1,000 AADT in 2036 with Welborne development, in comparison to the 2010 baseline scenario. Traffic on the M27 between junction 8 and 9 at the Hamble crossing is the only location where predicted traffic flows are expected to breach the 1,000 AADT threshold set out in the DMRB guidance. Total (two-way) flows are expected to increase by 2,959 AADT vehicle movements at this location. The Solent Maritime SAC is the only European site present within 200m of the M27 at this location. Two-way traffic flows on the A27 close to Paulsgrove Lake, Portchester, adjacent to Portsmouth Harbour SPA/Ramsar are predicted to increase by 924 AADT vehicle movements. Whilst the level of traffic growth at Portchester clearly falls beneath the DMRB threshold for triggering a more detailed assessment, both locations are considered further below.

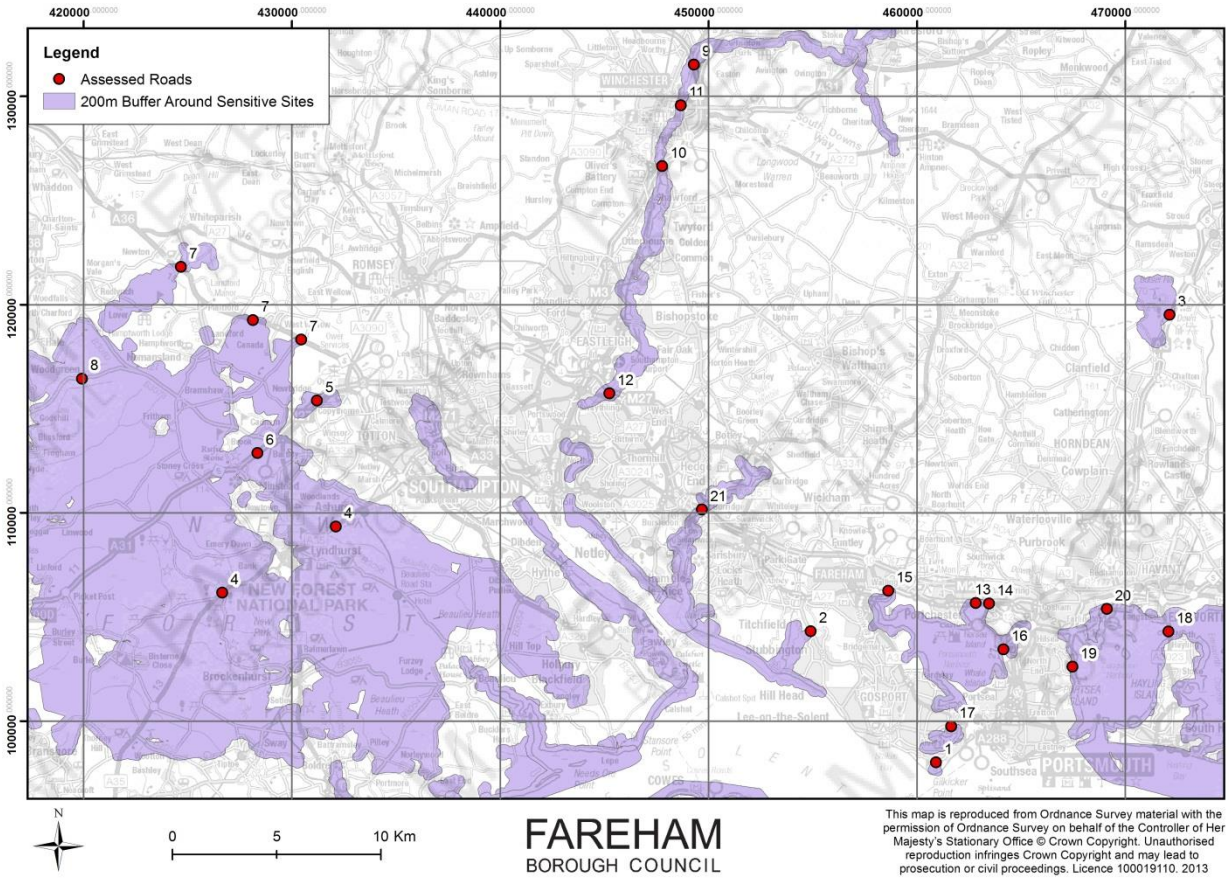

Figure 5.3: Location of modelled road links within 200m of European sites (Source: FBC)

Sensitivity of habitats at the affected locations

5.2.21 A data request was submitted to Hampshire Biodiversity Information Centre to acquire mapped priority habitat extents in the vicinity of the M27 at the Hamble, and A27 at Paulsgrove Lake. These are shown in Figure 5.4 and Figure 5.5. The map of the Hamble indicates that the majority of habitat in the area is intertidal mudflat with small patches of coastal saltmarsh, reedbed, and lowland mixed deciduous woodland. However, all of these habitats fall outside of the area designated as SAC which is limited to the channel of the River Hamble. The map of Paulsgrove Lake also shows that the majority of habitat is intertidal mudflat, with a thin ribbon of sand dunes at the northern boundary of the SPA/Ramsar.

Information relevant to the M27 Hamble crossing

5.2.22 The Air Pollution Information System[10] discusses the risk of atmospheric pollution impacts to a group of habitats it notes as coastal saltmarsh, which includes littoral sediment, coastal saltmarsh, intertidal mudflats, seagrass beds, sheltered muddy gravels, peat and clay exposures. It concludes that:

[10] APIS website [accessed 3/12/13]: http://www.apis.ac.uk/node/968

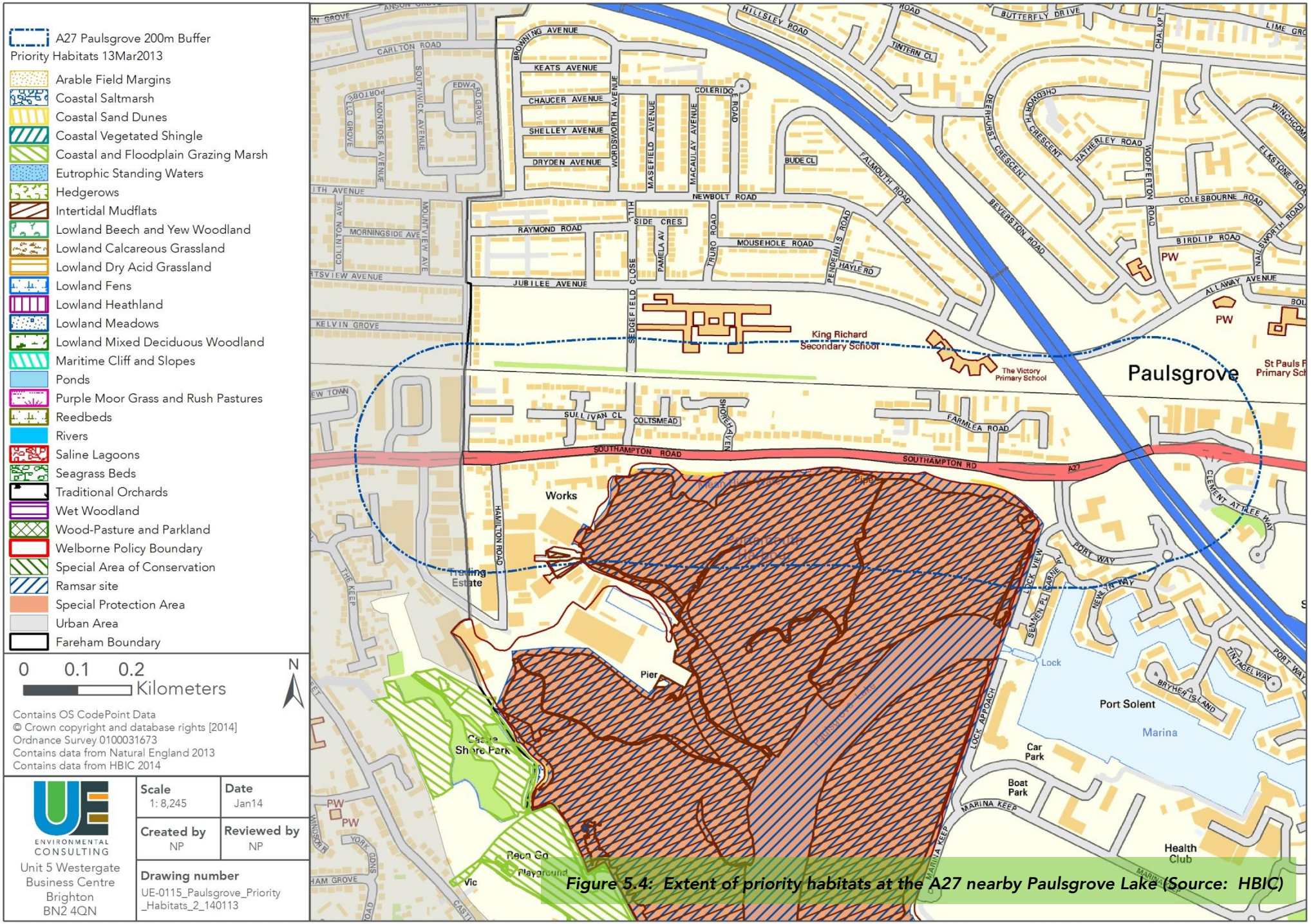

Figure 5.4: Extent of priority habitats at the A27 nearby Paulsgrove Lake (Source: HBIC)

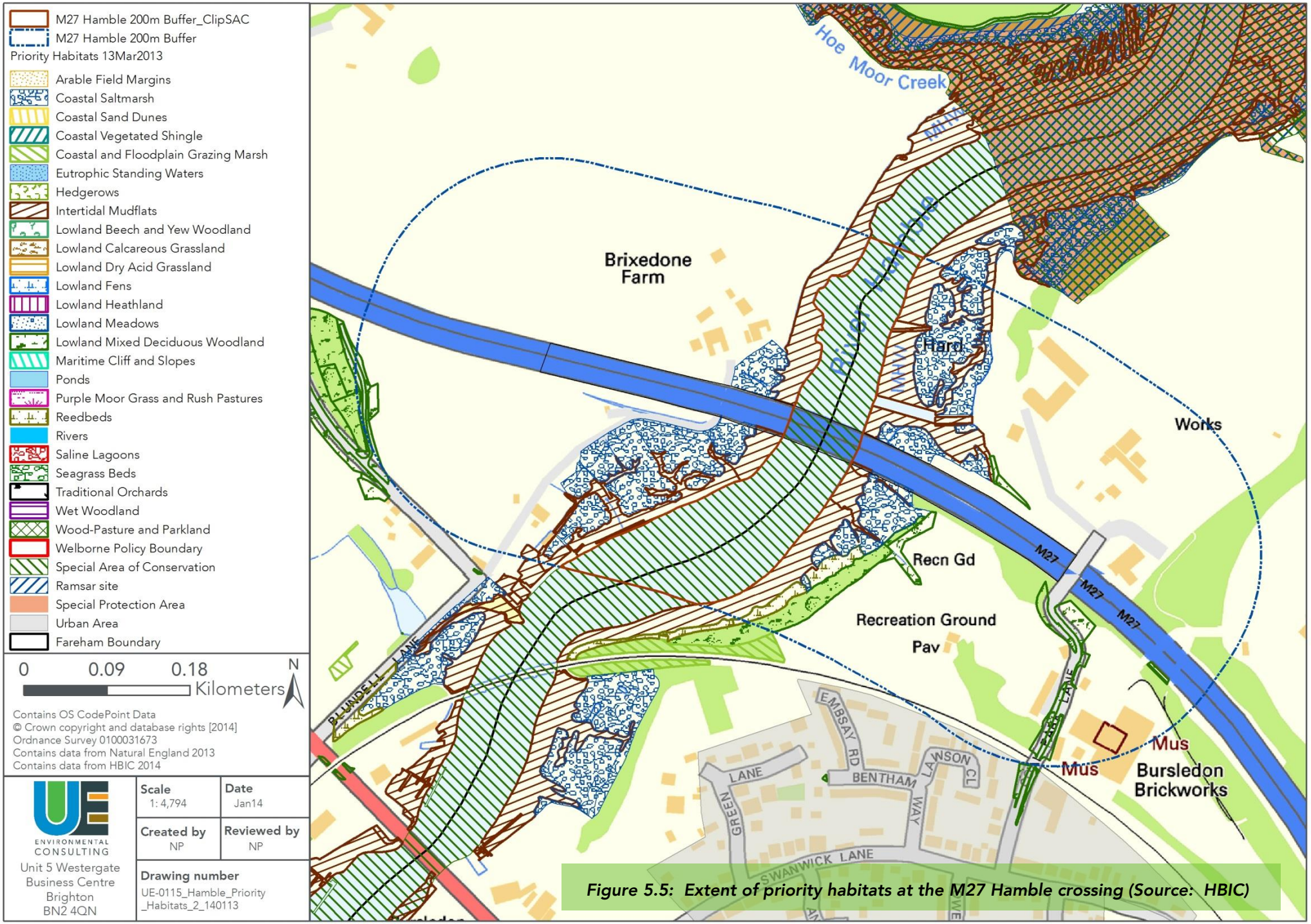

Figure 5.5: Extent of priority habitats at the M27 Hamble crossing (Source: HBIC)

"There are very few studies of N deposition effects on these systems, but work undertaken in the Netherlands suggest salt marsh vegetation is N limited…, which would make it vulnerable to eutrophication effects from atmospheric N deposition. However, the N addition experiments that have been undertaken have neither used very realistic N doses nor input methods i.e. they have relied on a single large application more representative of agricultural discharge.

"These studies have shown that the age of the marsh will influence the N response. This is because as marshes age i.e. during succession, N availability changes, increases as organic matter that has accumulated in the sediments is released through mineralization. They also demonstrate that N eutrophication will accelerate successional change and the speed at which some forbs decline.

"These systems are typically inter-tidal, ie subject to continual, daily, periodic flooding with saline water. The degree and frequency of flooding and the salinity vary, decline from the coast moving inland up the estuary and similarly species richness increases. They are considered to be among the most productive natural ecosystems because of the continuous flushing with nutrient rich waters. Also vegetation breakdown is quite rapid.

"In the absence of experimental studies of N deposition effects no quantified effects of potential modifiers are available. Overall N deposition is likely to be of low importance for these systems as the inputs are probably significantly below the large nutrient loadings from river and tidal inputs. Recent review by Boorman & Hazelden (2012) suggests that the pioneer low – mid saltmarsh areas are more resilient to N deposition than the mature upper areas. Any effects of N deposition are likely to be found in the tall vegetation of the closed upper marsh communities where interspecific competition is greatest. These more mature areas may also be subject to direct run-off from the surrounding catchment. Biogeochemical cycling of nutrients through microbial activity is quite rapid in this open system and N losses via denitrification may be considerable.

"There may be some localized effects of ammonia from wintering wildfowl, especially large geese flocks. Since P availability affects N responses in this habitat and wildfowl provide an additional source of P and K this factor should be considered. Most likely impacts would be loss of N sensitive species and increases in tall grass and graminoid biomass."

5.2.23 Given the low sensitivity of coastal saltmarsh habitats to atmospheric nitrogen inputs, and their locations in the Hamble estuary relative to the M27 and the SAC boundary, it is concluded that adverse effects on the integrity of the SAC are unlikely to result from increasing traffic flows at this location. The twice daily washing of mudflats within and adjacent to the SAC, as well as at Portsmouth Harbour SPA/Ramsar, further reduces the likelihood of significant adverse effects on this habitat type, particularly given that the Environment Agency estimates that approximately 64% of nitrogen as a whole comes from background marine sources in Solent marine sites such as Portsmouth Harbour (see section 5.6).

Information relevant to the A27 at Paulsgrove Lake

5.2.24 The Air Pollution Information System[11] discusses the risk of atmospheric pollution impacts to a group of habitats it notes as dunes, shingle and machair, which includes supralittoral sediment, coastal sand dunes, coastal vegetated shingle and machair. It concludes that:

> *"Sand dune habitats are one of the most natural remaining vegetation types in the UK, supporting over 70 nationally rare or red-data book species. Pressures threatening their existence include: sea-level rise, climate change, agricultural improvement, recreational use, lack of management, over-stabilisation and N deposition.*
>
> *"They are generally infertile and thus sensitive to N deposition. The greatest impact from N is likely to be on early succession communities which include many of the sand dune rarities. In UK dunes, effects of N occur through eutrophication and impacts on soils (Phoenix et al., 2012). In semi-fixed (open) dune habitats, N deposition increased cover of marram grass (*Ammophila arenaria*) and increased total biomass (Jones et al 2004), while in fixed dune grasslands, plant species diversity decreased and biomass increased. Acid dune systems appear to be more sensitive to N inputs than calcareous dunes. A gradient survey of a UK dune grassland community just starting to acidify showed strong declines in species richness (Hall et al. 2011)…*
>
> *"Ammonia deposition, can pose a real risk for the more acidic communities and there are likely to be point sources of wild animal and bird colonies e.g. seals, seabirds, geese etc sufficiently close to affect these systems. Anthropogenic point sources such as poultry units also present a serious risk to dune vegetation, altering plant growth and plant tissue N contents, even several kilometres upwind... The risk of change in species composition, driven by N deposition depends partly on a local source of propagules (seed, spore or fruit) e.g. farmland. The different types of dune system, from the sea moving inland will be differentially at risk*
>
> *"UK sand dune soils are generally well-buffered (high carbonate content), with the exception of the few acidic dune systems, and do not suffer from N led acidification. Soil C:N ratios generally increase (Jones et al. 2004), in contrast to other systems, while available N appears to decrease. Dissolved organic nitrogen (DON) concentrations in groundwater generally increase (Jones et al 2004). Nitrogen retention in sand dune soils is poor, due to the low levels of organic matter, so that excess N will be leached (…Hall et al. 2011), often as DON. Grazing (rabbits) will enhance leaching losses, but least from calcareous soils (Jones et al. 2005). However, sufficient N can be retained to cause adverse effects. Significant correlations between soil development and N deposition have been demonstrated over time (Jones et al. 2008), with implications for rates of successional development and long-term species change in dunes (Rowe et al. 2011). The moss layer is probably responsible for this N retention, retaining N deposition and slowly releasing it into the soil system when basal layers decompose (Plassmann et al. 2009).*

[11] APIS website [accessed 3/12/13]: http://www.apis.ac.uk/node/972

> *"Phosphorus limitation is common in many UK dunes and will moderate vegetation responses to excess N deposition. However, as the soil pH approaches 5, P solubility will increase and thus its availability, increasing the likelihood of adverse N stimulated eutrophication. Dunes affected by N deposition where P availability is sufficient to permit a growth response are likely to become dominated by* Festuca rubra *and to a lesser degree by* Poa pratensis *at the expense of other grasses, herbs and particularly mosses and lichens. Under P limiting conditions the loss of diversity will be restricted to the N sensitive species. Negative impacts of N most likely result from reduced light due to the expansion of grasses and forbs and increased litter production by these groups (Jones 2002)..."*

5.2.25 The traffic modelling results indicate that the Welborne Plan can be considered neutral in terms of local air quality and therefore no further assessment is needed. Furthermore, sand dunes are not a qualifying feature of Portsmouth Harbour SPA/Ramsar, and are unlikely to be of critical importance to the site's qualifying species given their habitat associations. However, since predicted traffic flow in this location is expected to approach the 1,000 AADT threshold, precautionary recommendations are given below.

Other plans and projects acting in combination

5.2.26 The following plans/projects identified at the screening stage may also contribute to road traffic emissions:

- Strategic Development at North of Whiteley
- West of Waterlooville, Havant
- Boorley Green development in Eastleigh borough
- Developments proposed at Tipner and Horsea Island in Portsmouth
- The Fareham Development Sites and Policies Plan
- Eastleigh Adopted Local Plan Review 2001-2011 (adopted 2006)
- Eastleigh Draft Local Plan (LDF) 2011-2029
- Winchester saved adopted policies in the Local Plan 2006
- Winchester Local Plan Part 1 - Joint Core Strategy (adopted 2013)
- Winchester emerging Local Plan Part 2 – Development Management and Allocations Document.
- Gosport Local Plan Review 2001 to 2016 (Adopted 2006)
- Gosport Borough Draft Local Plan 2011 to 2029
- Portsmouth City Local Plan saved policies (adopted 2006)
- The Portsmouth Plan (adopted 2012)
- Portsmouth AAPs (Somerstown and North Southsea AAP & Southsea Town Centre AAP)
- Portsmouth emerging Site Allocations DPD
- 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)

Recommendations in relation to atmospheric pollution

5.2.27 Based on current traffic modelling results from the SRTM (run 8b), there is predicted to be an exceedance of the DMRB threshold of 1,000 AADT vehicle movements at the M27 Hamble crossing only. However, modelling results for the A27 near to Paulsgrove Lake indicate that future traffic flow could increase by 924 AADT vehicle movements, which is approaching the DMRB threshold figure. The future project-level HRA for outline planning applications for development at Welborne will need to take this into account and demonstrate that the final proposed junction arrangements for the new community would not lead to a breach of the 1,000 AADT threshold on any road link passing within 200m of SAC/SPA/Ramsar sites in and around the borough.

5.3 Disturbance

5.3.1 Particular concerns have been expressed in recent years regarding the likelihood of planned developments, including Welborne, to increase human activity within and close to European designations at the New Forest and Solent coastline. 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).

5.3.2 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).

New Forest

5.3.3 At the New Forest, it is the ground and near-ground nesting birds that are particular receptors of negative effects, such as Dartford Warbler, Nightjar and Woodlark.

5.3.4 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.

5.3.5 Similarly, the study by Murison *et al* (2007) revealed that for Dartford Warbler on Dorset heathland, disturbance also reduced breeding activity, particularly so in heather-dominated territories. Birds in heavily disturbed areas (eg, 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.

5.3.6 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.

5.3.7 Sharp *et al* (2008) estimated the number of annual visits to the New Forest to be over 13 million per year, a figure which they predicted to increase by 1.05 million visits by 2026 based on sub-regional development objectives at the time the work was carried out. They estimated that around three quarters (764,000) of this annual total increase will originate from within the first 10km from the Forest. This then reduces to between 10,000 and 50,000 additional visitors from within each 1km band originating between 8 and 18 km from the Forest in any direction. This further declines to approximately 3,000 – 4,000 additional visitors per year beyond a distance of 20km. Welborne is around 14km from the New Forest at its closest point and so its residential proposals will therefore fall within the sphere of potential influence on the SPA.

5.3.8 The New Forest's Recreation Management Strategy (New Forest NPA, 2010) sets out a long term vision for how recreation will be managed and promoted in the New Forest National Park between 2010 and 2030. It aims to ensure that the opportunities for recreation and enjoyment that the National Park offers will be protected and enhanced, whilst a balanced approach to management will safeguard the conservation of the special qualities of the Park, its wildlife and habitats. A series of priority actions are outlined which address some of the major challenges facing the National Park. These are grouped around the following key themes:

- Active engagement with users, land managers and providers of recreation to further the first and second purposes of the National Park;
- Appropriate communication structures and events will be set up, as required, to enable active discussion between user groups, land managers and recreation providers to address matters of conflict (actual or perceived) and mutual interest;
- A programme of survey and research will be implemented to inform future discussions and decisions about the management of recreation. The Strategy will be reviewed after five years in the light of this evidence;
- The majority of recreational activity will be focussed on gateway locations. The potential for enhancing facilities within the New Forest National Park will be explored at these sites and around a core network of sustainable access routes;

- The provision of new areas of green infrastructure will absorb the anticipated growth in levels of recreational demand from new housing and increased populations in adjacent urban areas. This will be achieved by working with neighbouring Authorities to improve the provision of new and enhanced facilities within or close to the growth areas; and
- Capacity for further growth in visitor numbers within the National Park will be managed by having a maximum number of car park spaces and limiting the provision of new facilities outside villages.

5.3.9 In response to the third bullet point above, a partnership project between Natural England, the Forestry Commission and the New Forest National Park Authority was established to understand the contribution of visitor impacts to the fluctuating numbers of Annex I birds in the New Forest (Dartford Warbler, Hen Harrier, Honey Buzzard, Nightjar and Woodlark). This aims to follow up the work by Sharp *et al* (2008) to investigate the possible effects of recreational disturbance on Annex I birds in the New Forest SPA. The research is to be carried out in collaboration with key stakeholders in order to develop a greater understanding of recreational needs and patterns in the New Forest, which will inform the five-year review of the strategy.

5.3.10 It is understood that the findings of the project may lead to further recommendations for changing the management of visitor pressure within the SPA. The visitor data used by Sharp *et al* (2008) was requested from the Forestry Commission but had not been received by the time this document was published. Further analysis of this data would help to define the extent to which residential development within Welborne could increase visitor pressure and disturbance impacts within the SPA. Financial contributions could then be sought towards implementing management measures to reduce disturbance impacts.

Solent sites

5.3.11 The Solent Disturbance and Mitigation Project (SDMP) 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 (Fearnely *et al*, 2011) and disturbance impact modelling (Stillman *et al*, 2012). Phase 3 outlines an avoidance and mitigation strategy to prevent adverse effects on overwintering bird populations around the Solent (Liley & Tyldesley, 2013).

5.3.12 The Solent provides locations for a wide range of recreational activities, and the SDMP Phase 1 report illustrates the high levels of housing around the Solent shoreline, which includes particularly high densities in the urban areas of Southampton and Portsmouth. An estimated 1.44 million people live within a ten minute drive of a car park at the Solent coast (Stillman *et al*, 2009). Tourists make up a significant proportion of visitors at some sites, although sites vary in their attractiveness to tourists, suitability for particular kinds of access, and accessibility to the local population. To the east of Southampton Water there are much higher densities of housing and at many sites local people are likely to account for a higher proportion of visitors. Sites such as Hayling Island have holiday accommodation and attract staying tourists. Future

development is likely to result in a large increase in the residential population, particularly in the vicinity of Southampton, Portsmouth and Fareham.

5.3.13 Reports from phase 2 of the project provide an interesting snapshot of visiting activity at surveyed sites within Fareham borough: Hook with Warsash Nature Reserve, Salterns Park (Titchfield Haven), and Salterns Quay (Fareham), the latter being at the head of Fareham Lake and the closest survey site to the Welborne. The majority of people interviewed at the site (86%) were walking the dog, and most travelled by foot to reach the site (81%). The visitor survey (Fearnley *et al*, 2010) found that the median distance people travelled to Salterns Quay, by car or on foot, was 0.5km (see Table 9 of the report), with no journeys greater than 7.6km, making it one of the most highly local sites in terms of patronage of all the sites surveyed across the Solent. Welborne is not within the average distance travelled to the Salterns Quay, although that does not necessarily indicate that it will not be visited by future Welborne residents.

5.3.14 The phase 2 bird disturbance fieldwork (Liley *et al*, 2011) surveyed the same three sites within Fareham borough, as well as other sites across the Solent, and indicates that birds utilising the Solent as a whole are relatively well habituated to human activity. Overall, of the 4,064 observations recorded, 82% were categorised as birds exhibiting 'no response'; 17% resulted in a change of behaviour (there were also 11 observations that were uncategorised). In all, 4% of observations led to birds becoming alert, 3% to a short walk, 2% a short flight and 8% a major flight. The results for the Salterns Quay survey location follow a similar pattern: of the 247 observations recorded, 83% were categorised as 'no response' and 17% resulted in a change of behaviour, with 2.8% of disturbance events leading to a major flight.

5.3.15 Results from the household survey were used to develop models of current and future visiting rates across the various sections of Solent coastline (Fearnley *at al*, 2011). Results were analysed according to a number of factors including demographic information, frequency of visit, mode of transport, distance from coast, dog ownership, and aspects of coastal features and facilities that attract or discourage visits. Across the Solent, predicted current visiting rates are estimated at 52 million annual visits. See for example Figure 5.6, which illustrates variations in the predicted annual number of current visits to each section of the Solent coastline. Current predicted levels of visiting at the four sections of coast closest to Welborne are shown in Table 5.2.

Table 5.2: Current predicted annual visits to coastal sections near Welborne (Source: Fearnley* at al, *2011)

No	Description	Foot	Car	Total
43	Fort Elson to Fleetlands	0	1,434	1,568
44	Fleetland to s. side of golf course	274,793	27,344	330,236
45	Golf course to boat yard	238,045	203,649	482,772
46	Boat yard to Portchester East	739,952	523,628	1,381,092

5.3.16 The final report to be released during phase 2 of the project modelled the impact of disturbance events on various wading bird species (Dunlin, Ringed Plover, Redshank, Grey

Plover, Black-tailed Godwit, Bar-tailed Godwit, Oystercatcher *Haematopus ostralegus* and Curlew) and Dark-bellied Brent Goose within Southampton Water and Chichester Harbour (Stillman *et al*, 2012). The models account for the intertidal invertebrate food supply of the birds, the exposure and covering of this food through the tidal cycle, disturbance from human activities, and the energy requirements and behaviour of the birds as they avoid humans and search for food. The models incorporate the costs that birds incur when avoiding human activities (e.g. increased density in non-disturbed areas, reduced time for feeding and increased energy demands when flying away), but also their abilities to compensate for these costs (e.g. by feeding for longer or avoiding more disturbed areas).

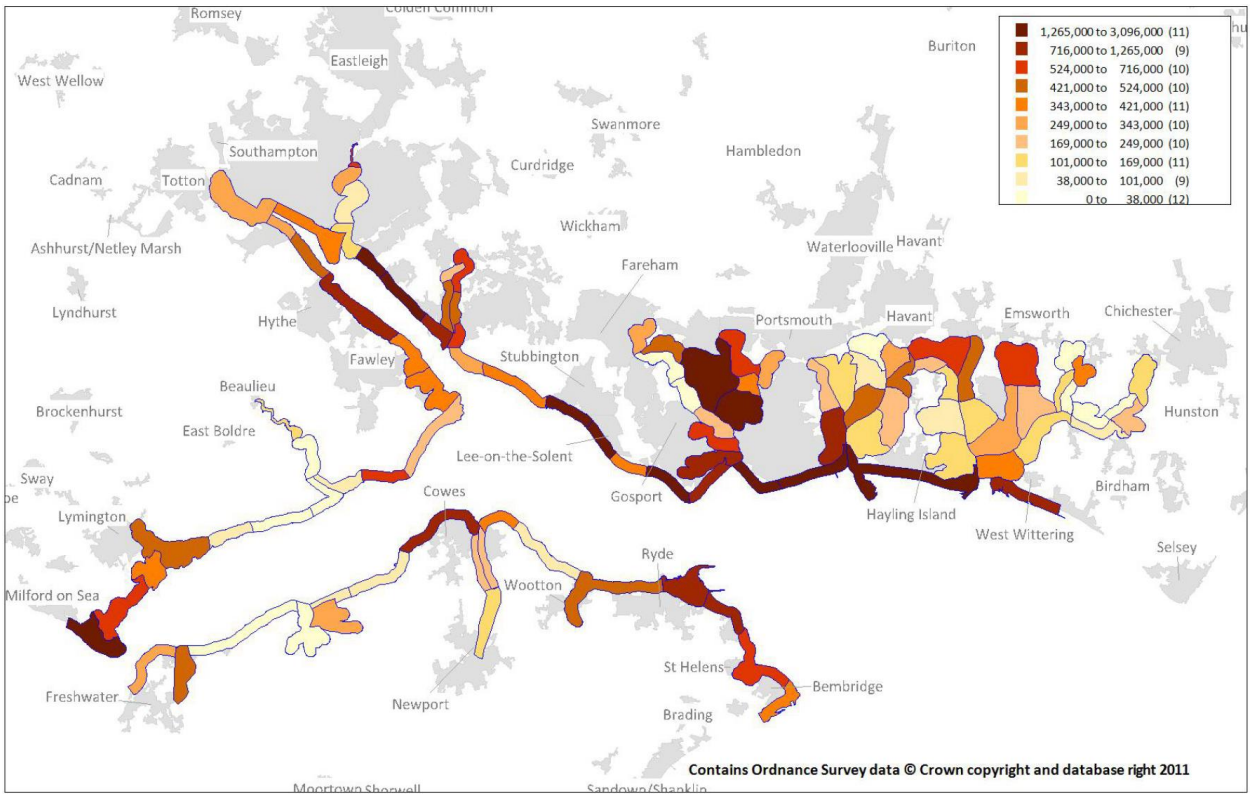

Figure 5.6: Current predicted annual visits to Solent coastal sections (Source: Fearnley at al, 2011)

5.3.17 Local authorities in the Solent region provided projections of future housing developments in the region. These were combined with data on visitor rates to different parts of the coast and the distance travelled to visit the coast, to predict coastal visitor rates with current and future housing. Under the future housing scenario, visitor numbers were predicted to rise by around 8 million household visits, to a total of 60 million, an overall increase of 15%.

5.3.18 Anomalies within the invertebrate food supply data available for Chichester Harbour meant that modelled results were not reliable (Stillman *et al*, 2012); the food supply available was not predicted to be able to support the majority of wading birds modelled even without disturbance. Within Southampton Water, without disturbance all wader species modelled were predicted to have 100% survival and maintain their body masses at the target value throughout the course of winter. Disturbance from current housing was predicted to reduce the survival of Dunlin, Ringed Plover, Oystercatcher and Curlew. Increased visitor numbers as a result of future

housing was predicted to further reduce the survival of Dunlin and Ringed Plover; see Figure 5.7. Variations between the relative sensitivity of birds to an overlap (sharing of the intertidal) with visitors were also explored (Figure 5.8) which suggests that Dunlin and Ringed Plover are particularly sensitive to visitor disturbance.

5.3.19 Further model runs explored how intertidal habitat area, energy demands of the birds and the frequency of different activities may influence the survival of waders within Southampton Water. The survival rates of Dunlin, Ringed Plover, Oystercatcher and Curlew were predicted to be decreased by any reduction in intertidal habitat area (e.g. due to sea level rise) or increases in energy demands (e.g. due to disturbance at roosts or cold weather). Wader survival was predicted to increase if intertidal activities were moved to the shore. This meant that the disturbance from these activities was restricted to the top of the shore rather than the whole intertidal area, and so the proportion of intertidal habitat disturbed was reduced. Reductions in the number of dogs that were off leads were also predicted to increase the survival of Dunlin and Ringed Plover.

5.3.20 Stillman *et al*, 2012 found that predicted current visitor rates vary widely throughout the Solent, but were relatively high within Southampton Water. Wader survival was predicted to be decreased in Southampton Water when daily visitor rates to coastal sections were greater than 30 per ha of intertidal habitat. The potential impact of visitors on wader survival throughout the Solent was calculated by comparing visitor densities throughout the Solent (expressed relative to maximum intertidal habitat area) to the visitor densities predicted to decrease bird survival within Southampton Water (30 per ha). There is doubt as to the food supply within other harbours around the Solent and so some caution is appropriate when applying the results from Southampton Water to these sites.

5.3.21 Coastal sections with daily visitor rates over 30 per ha are identified; see Figure 5.9. Sections 44 (Fleetlands to south side of Golf Course) and 45 (Golf Course to Boat Yard) are both predicted to exceed this threshold. The predictions of the Southampton Water model suggest that birds within these sections may have reduced survival due to disturbance from visitors. Whether or not such visitor rates will reduce survival will depend on the food abundance in the coastal sections themselves as well as that in neighbouring sections.

Dark-bellied Brent Goose

5.3.22 There were insufficient data to build predictive models of the impact of disturbance on the survival of Brent Goose because the available biomass of intertidal and terrestrial food sources was not known. However, some conclusions were drawn from similar studies elsewhere, and explored for their applicability in the Solent. Firstly, the response distance of Brent Goose to sources of disturbance is comparable with waders; the median distance within which there was no response to a potential disturbance event was 97m. In general, disturbance has not been shown to negatively affect Brent Goose survival so long as there is sufficient time and food availability to compensate for disturbance. Intertidal beds of eelgrasses, and terrestrial pasture, arable, grassland and saltmarsh habitats are all important food sources.

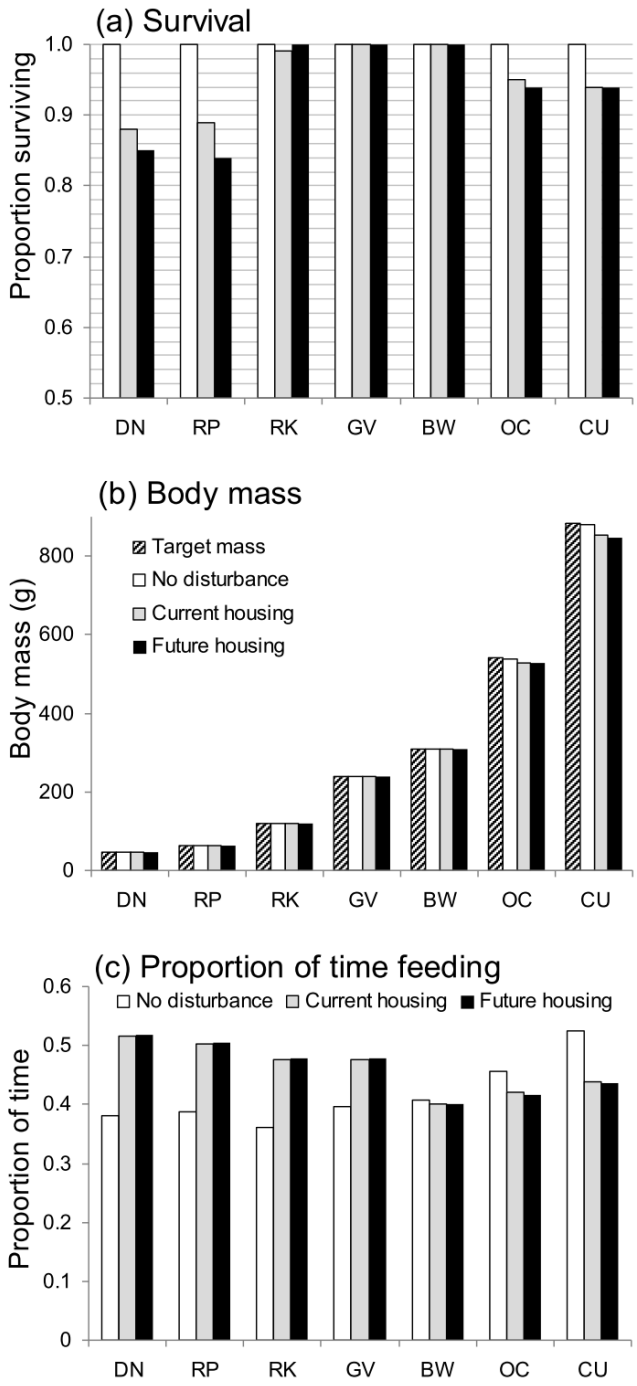

Figure 4.4 Predicted effect of disturbance on waders in Southampton Water: (a) survival; (b) end of winter body mass; and (c) mean proportion of time feeding on intertidal habitat. Open bars show predictions in the absence of disturbance, grey bars predictions with disturbance from current housing and black bars predictions with disturbance from future housing. Simulations assumed that the site was divided into 3 sub-sites. The horizontal bars in (a) show the 95% confidence intervals of predicted survival – values must differ by more than this value to be significantly different. The following codes are used for the bird species: DN = Dunlin; RP = Ringed Plover; RK = Redshank; GP = Grey Plover; BW = Black-tailed Godwit; BA = Bar-tailed Godwit; OC = Oystercatcher; CU = Curlew.

Figure 5.7: Predicted effect of disturbance on waders in Southampton Water (Source: Stillman et al, 2012)

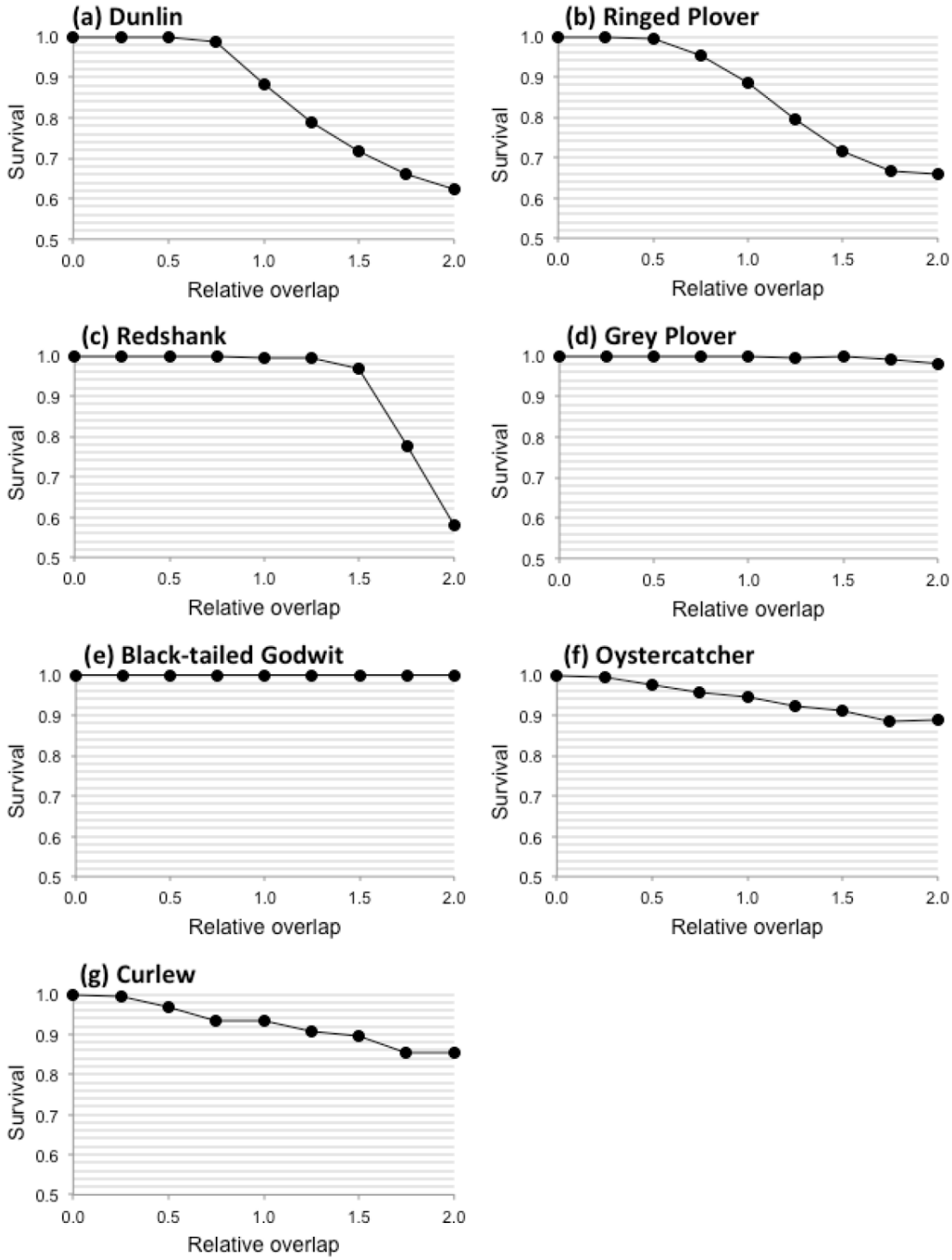

Figure 4.5 Predicted effect of the overlap between the distributions of birds and visitors on the survival of waders in Southampton Water. Simulations assumed that the site was divided into 3 sub-sites, and were based on the current housing scenario. A relative overlap of 1 indicates that birds and visitors are distributed independently. A value greater than 1 indicates that birds and visitors are aggregated, and less than 1 that birds and visitors are separated. The horizontal bars show the 95% confidence intervals of predicted survival – values must differ by more than this value to be significantly different.

Figure 5.8: Predicted effect of overlap between the distribution of birds and visitors (Stillman et al, 2012)

5.3.24 Terrestrial sites favoured by Brent Goose tend to be large, flat, open and low-lying, and close to the coast. The number of buildings surrounding a site is a less significant factor for Brent Goose than for waders. Conversely, important Brent Goose sites tend to be closer to one another whereas important wader sites tend to be more isolated from each other (King, 2010). Loss of terrestrial habitat typically has the highest predicted effect on Brent Goose survival. Such habitat may become even more important for the birds in future when sea level rise is predicted to lead to the loss of areas of saltmarsh (Stillman *et al*, 2012).

5.3.25 Important issues for Brent geese are the size of individual feeding sites, their spacing and the ease with which birds can move between the sites (Stillman *et al*, 2012). A high proportion of each site needs to be further away from visitor access routes than the distances over which birds are disturbed to ensure that disturbance to the birds is minimised. This could be achieved through a network of larger sites or by preventing visitor access through, or close to, smaller sites.

Contribution of Welborne to future visiting rates at the Solent

5.3.26 Data from site-specific surveys of visiting behaviour in the Welborne area are not currently available. In its absence, data from the on-site and household visitor surveys collected during the SDMP were requested from the Solent Forum[12]. Welborne falls predominantly within the western half of post code stem area PO17, currently a sparsely populated rural area which includes most of Funtley. Fareham town broadly falls into three areas; south Fareham (PO14), west Fareham (PO15) and east Fareham (PO16); see Figure 5.10. Together the four areas account for 15,665 domestic delivery addresses or, at a dwelling occupancy rate of 2.3 people per dwelling[13], 36,030 residents. The Welborne evidence base has used the Chelmer model to forecast the population of the new community, which shows that the peak population for Welborne is expected to be around 15,000 (based on 6,000 dwellings) due to a trend of higher household occupancy rates (of around 2.5 per dwelling) in new developments.

5.3.27 Of a total of 784 interviews conducted on-site throughout the Solent, 44 originated from south Fareham town, 13 from west Fareham, 37 from east Fareham, and one from the Welborne area (95 in total for Fareham town, or 12% of all on-site interviewees). Of a total of 1,382 householder-completed postal questionnaires throughout the Solent, 52 were returned from south Fareham town, 28 from west Fareham, 53 from east Fareham and five from the Welborne area (138 in total for Fareham town, or 10% of the total received), a broadly comparable number.

[12] Data were supplied with the following caveat: Any raw data to contain the caveat that the SDMP is seeking evidence at a strategic level across the Solent and within designated sites, and that the data is not to be used out of context to try and inform the effect of disturbance at a local level. Moreover the project is designed to use bird disturbance survey data together with visitor survey data, household surveys data and bird food supply data to model current and future visitor pressure and disturbance. This is important as data at a local level may not have sufficient sample size or suitable context to make meaningful local conclusions.

[13] Census 2011 data indicates that there are 47,941 dwellings in Fareham borough, and a population of 111,581, giving a dwelling occupancy rate of 2.3: http://www.neighbourhood.statistics.gov.uk/dissemination/

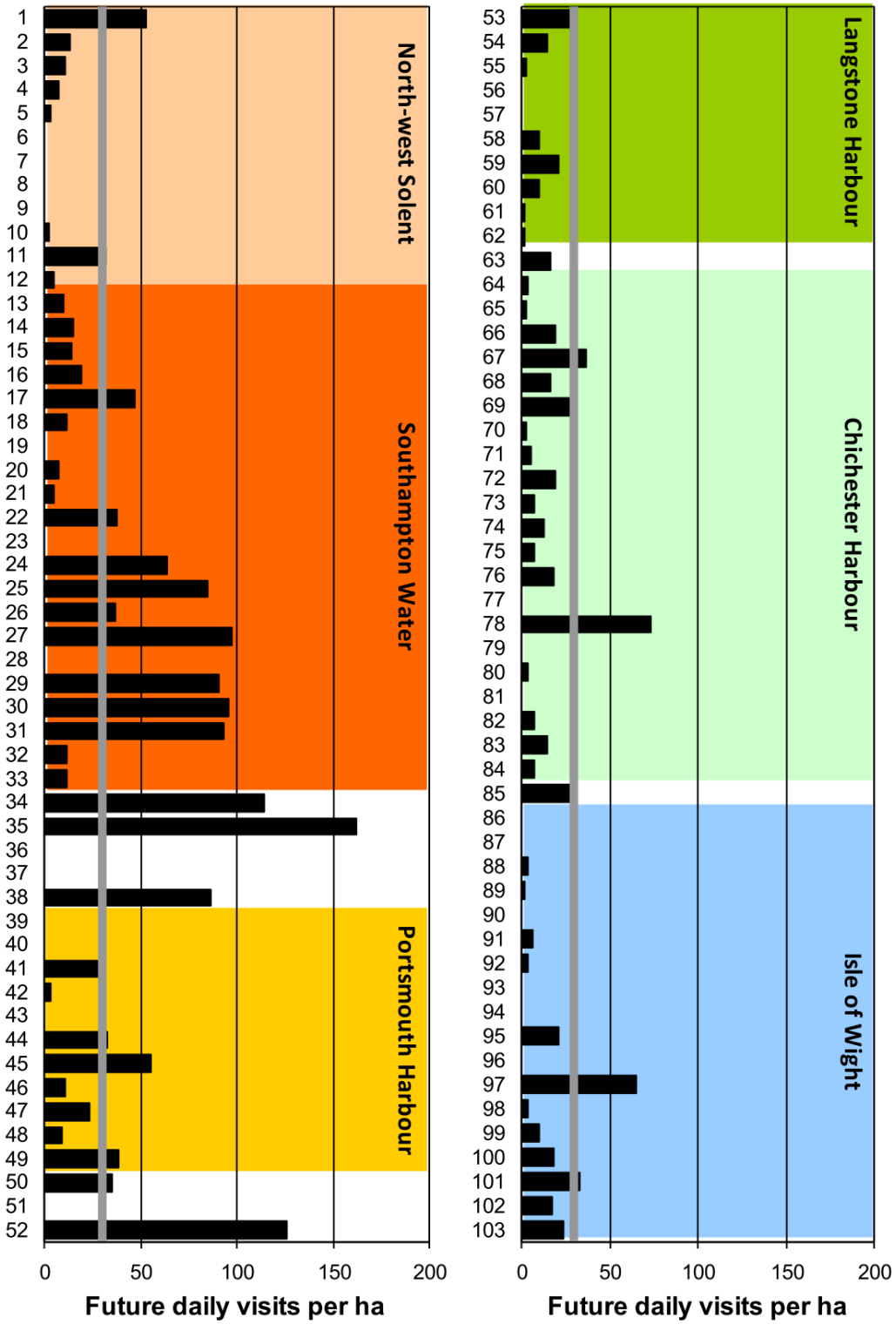

Figure 5.7 Predicted future daily visitor rates during autumn and winter per ha of intertidal habitat (on a spring low tide) within each coastal section throughout the Solent. Values are only shown for sections with an intertidal area over 10 ha. The numbers refer to the coastal sections shown in Figure 5.1, and the colours indicate sections within different sites. Sections without colour do not contain an habitat within a Special Protection Area. The vertical grey bars indicate a daily visitor rate of 30 per ha.

Figure 5.9: Predicted future daily visitor rates per ha of intertidal (Stillman et al, 2012)

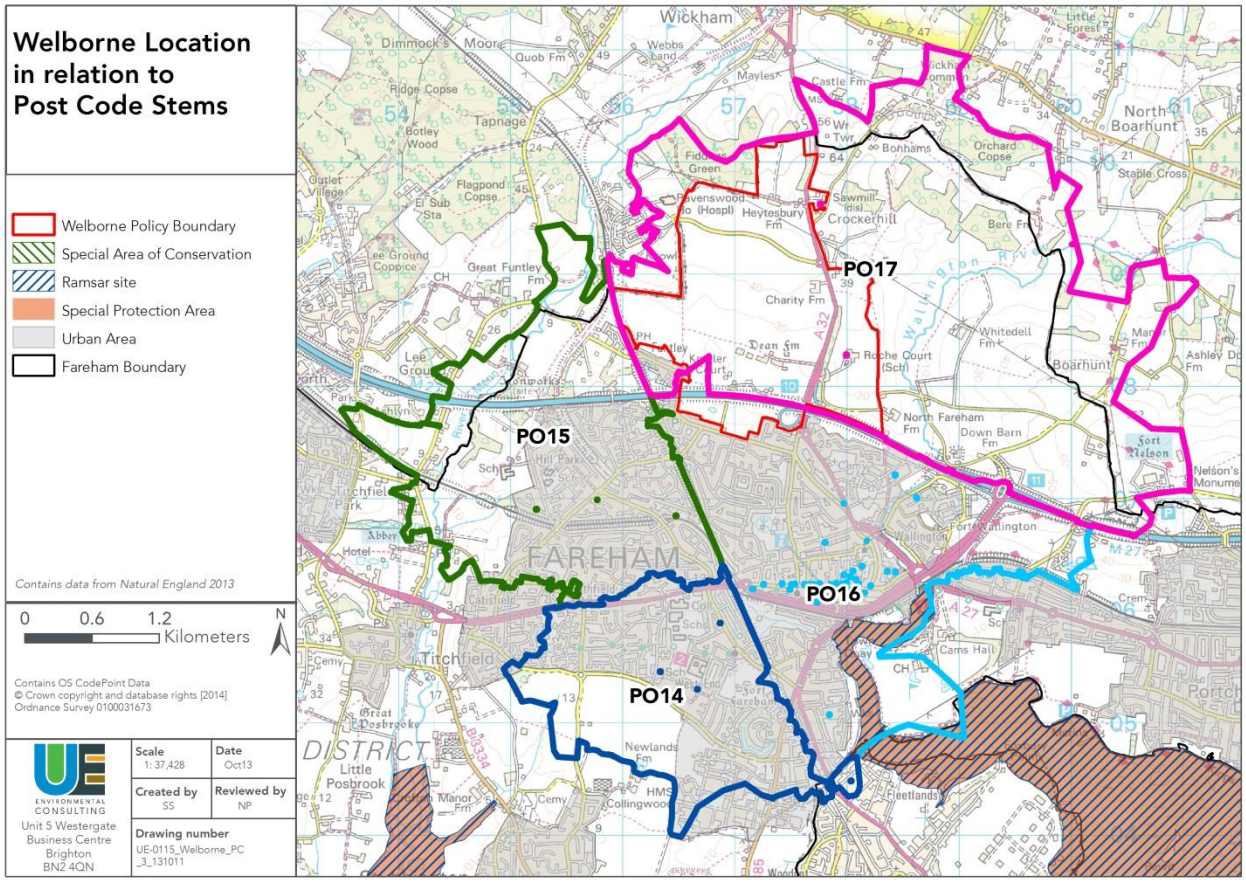

Figure 5.10: Welborne in relation to post code stem areas

5.3.29 The average visiting frequency of these 138 respondents was calculated from the data supplied by Solent Forum. Using the assumed number of visits per year listed in Fearnley *et al* (2011, Table 2; e.g. between two and four times a week equates to 150 visits annually) the average visiting frequency of Fareham residents was calculated to be 67 visits per year. If residents of Welborne exhibit similar visiting patterns to those recorded by residents of Fareham town, they can be expected to generate a total of 1,005,000 annual visits to the Solent coastline. As a comparison, Fearnley *et al* (2011) estimate that, on average, each household in the Solent area visits the coast 132.8 times a year. By this broad brush estimation, the 6,000 dwellings planned for Welborne would generate 796,800 annual household visits, or 1,992,000 annual person visits (based on an occupancy rate of 2.5 people per dwelling).

Avoiding and mitigating adverse disturbance effects on the Solent

5.3.30 The SDMP Phase 3 report (Liley & Tyldesley, 2013) considers 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 outlines 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 main aspects of the strategy include:

- A delivery officer to coordinate implementation of the strategy;
- A team of wardens or rangers to provide on-site presence and talk to visitors;

- A coastal dog project to provide information and promote suitable sites for dog walking;
- A review of parking and access points to provide a baseline from which future changes (additional/reduced parking in certain locations) can be planned and monitored;
- A review of watersports zones and access;
- Codes of Conduct packs relating to the above;
- A series of site-specific projects such as path re-routing, path creation, dedicated areas for dogs or watersports, enhanced facilities for watersports, changes to car parking and so on;
- Watersports permits and enforcement; and
- SANGs, green infrastructure projects and alternative roost sites.

5.3.31 The third phase of the SDMP recommends that financial contributions towards delivering the avoidance and mitigation measures should be collected from new residential development proposals within 5.6km of the Solent, a distance which includes Welborne. It concludes that the strategy, once implemented, would be sufficient to address the impacts of a multitude of smaller scale residential proposals, but that larger scale schemes and those very close to the designated coast will still require individual project-level HRA and site-specific mitigation.

Other plans and projects acting in combination

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

- Strategic Development at North of Whiteley
- West of Waterlooville, Havant
- Boorley Green development in Eastleigh borough
- Developments proposed at Tipner and Horsea Island in Portsmouth
- The Fareham Development Sites and Policies Plan
- Eastleigh Adopted Local Plan Review 2001-2011 (adopted 2006)
- Eastleigh Draft Local Plan (LDF) 2011-2029
- Winchester saved adopted policies in the Local Plan 2006
- Winchester Local Plan Part 1 - Joint Core Strategy (adopted 2013)
- Winchester emerging Local Plan Part 2 – Development Management and Allocations Document.
- Gosport Local Plan Review 2001 to 2016 (Adopted 2006)
- Gosport Borough Draft Local Plan 2011 to 2029
- Portsmouth City Local Plan saved policies (adopted 2006)
- The Portsmouth Plan (adopted 2012)
- Portsmouth AAPs (Somerstown and North Southsea AAP & Southsea Town Centre AAP)

- Portsmouth emerging Site Allocations DPD
- Hampshire Local Transport Plan (2011-2031)

Avoidance and mitigation measures proposed by the Welborne Plan

5.3.33 The Publication Draft Welborne Plan acknowledges the risk of impacts to internationally protected sites at the Solent and responds to this in the requirements of proposed policy WEL30 – see Box 1.

Box 1: WEL30 – Avoiding and mitigating the impact on internationally protected sites and off-site green infrastructure

Development proposals shall be accompanied by a full assessment of the potential impacts on habitats and biodiversity of all sites of national and international importance that may be adversely impacted through the development of Welborne. This assessment shall consider the impacts in combination with other nearby sites allocated for development as identified in the accompanying Habitats Regulations Assessment. The assessment shall set out the on-site and off-site measures proposed in order to avoid or mitigate potential impacts on these internationally protected sites.

Unless an alternative strategy is agreed by the Council and Natural England (which might require more or less green infrastructure), in order to avoid or mitigate potential impacts on the internationally protected sites on the Solent, it is expected that around 84 hectares of suitable alternative natural green space (SANGS) shall be provided either on or immediately adjoining the site. The 84 hectares is based on 6,000 dwellings and could increase or decrease if the number of homes delivered changes

The figure represents 70% of the SANGS standard of 8 hectares of natural green space per 1,000 population, applied to the anticipated peak population at Welborne of around 15,000.

A financial contribution shall also be required towards implementing the Solent Disturbance and Mitigation Strategy. This shall provide for the mitigation of the potential impacts on the internationally protected sites along the Solent coastline that cannot be achieved solely through the delivery of on and off-site green infrastructure at Welborne.

The Council will continue to work with Winchester City Council to determine the appropriate uses of the natural greenspace within their area and the management that will be required. It is expected that a financial contribution will be required from the Welborne development to lay out and help fund on-going management of these areas.

5.3.34 The justification text which explains the need for the policy adds that, where adequate mitigation or avoidance measures cannot be achieved on or adjoining the site through the provision of Suitable Alternative Natural Greenspace (SANG), a financial contribution will be sought to provide off-site mitigation measures. It states that SANG will be needed in addition to the general green infrastructure requirements (such as sports facilities and play grounds) set out by the plan, and that it should be provided adjoining and in close proximity to the site, with multiple links to the wider GI network.

5.3.35 The plan goes on to explain that there are no national or local standards applicable to the Welborne development for the provision of land to mitigate or avoid impacts to protected sites. The nearest equivalent is the SANG standards adopted in relation to the Thames Basin Heaths

SPA. This standard was developed by the adjacent Local Authorities together with Natural England and other wildlife bodies such as the RSPB. If this standard were to be applied to Welborne then, with a projected population of around 15,000 persons, it would require 120ha of SANG.

5.3.36 However, the main distinguishing feature from the Thames Basin is the presence and attractiveness of the Solent coastline. Therefore, Natural England has advised that as a broad rule of thumb it would be anticipated that a target of at least 70% of the SANG standard should be met on or adjoining the site. This equates to a requirement of around 84ha of SANG provided on land within or adjoining Welborne. The balance of the mitigation requirement will be met through a financial contribution towards the measures to be set out in the SDMP to mitigate potential impacts along the coast. This is a 'rule of thumb' breakdown, and if it were to prove possible to exceed the 70% target then this would be encouraged by the Council.

5.3.37 The requirement for around 84ha of land as alternative natural green space could be provided through the combination of land within and adjoining Welborne. This includes Dash Wood and the triangle of land adjoining Knowle, together with land at Fareham Common. This land, shown indicatively on the Strategic Framework Diagram (Figure 1.2), should be set out and managed as natural green space or open countryside in accordance with the broad character area within which it sits.

5.3.38 Collectively these sites have the potential to deliver up to 70.5ha of SANG. The final total will depend on land assembly issues, and the extent to which other uses such as the motorway junction arrangements constrain its value as SANG. It will also be possible to contribute towards the provision SANG, by incorporating an element of the semi-natural green space proposed for Welborne into the network of SANG, especially on the edges of the site where it abuts areas of potential SANG.

5.3.39 Discussions with Natural England have also indicated that SANG should provide a varied but semi-natural landscape and experience and as a minimum should provide the following:

- Car parking for visitors from outside the area;
- Interpretation and information boards;
- Walks, including dog-walking facilities, and runs of between 2.5KM to 5km in length. The routes should be circular and wherever possible should not cross main roads;
- Footpaths should be surfaced but not with tarmac or a similar hard surface; and
- The routes should all be way marked.

5.3.40 Proposed policy WEL35 outline requirements for the governance of green infrastructure provided for Welborne to ensure it is suitably managed and maintained in perpetuity – see Box 2.

5.3.41 The Infrastructure Delivery Plan (IDP) for Welborne (AECOM, January 2014) sets out the range of infrastructure that will be required to support the new community, based on the Council's Concept Masterplan, and the phase at which each facility will be required to be operational. This states that 70.5ha of SANG is intended to be delivered through a combination of sites at

Dash Wood, Knowle Triangle and Fareham Common, and that an additional 14ha will be provided by on-site GI performing dual role. The IDP further indicates that a financial contribution (calculated to be £675,000) will be made to the SDMP avoidance and mitigation strategy, that both the financial contribution and SANGs are classified as 'essential infrastructure' (i.e. that they are necessary to make the proposed development acceptable in planning terms and are directly related to the proposed development), and that their delivery should be phased throughout the development programme in line with the rate of residential completions.

Box 2: WEL35 – Governance and maintenance of green infrastructure

The green infrastructure network plan submitted to the Council with initial planning applications will:

(i) Be accompanied by an implementation, phasing and management plan which clearly sets out how and when the network will be completed and how it will be maintained in perpetuity; and

(ii) Identify who will ultimately adopt and have responsibility for managing and maintaining the different components of green infrastructure within and adjoining the site.

5.3.42 Neither policy WEL30 nor its supporting text refer to avoiding and mitigating disturbance impacts at the New Forest SPA. Disturbance impacts to ground-nesting birds within the SPA are related to walkers and dog walkers and it is likely that the population of Welborne will contribute to future visitor numbers within the New Forest because of its special qualities and National Park designation, although it has not been possible to demonstrate this because visitor survey data has not been forthcoming. However, given the distance of the New Forest from Welborne these visits are likely to be far fewer in number than those visiting the coast. Having established the principle of providing approximately 84ha of SANG at Welborne to meet the daily walking and dog walking needs of future Welborne residents, it is considered that the majority of potential impacts on the New Forest would also be avoided. Financial contributions to the New Forest Recreation Management Strategy could be agreed in the same way that the Welborne SANGs will be supplemented by a financial contribution to the SDMP, if the additional studies being carried out as part of the RMS show this to be necessary.

Recommendations relating to disturbance impacts

5.3.43 It is recommended that ecological surveys are undertaken within Dash Wood to establish its capacity to accept significantly increased visitors numbers as a result of its planned allocation as SANG. If any of the area which is currently assumed to be able to contribute towards meeting the SANG requirement is in any way reduced following the surveys, then an equivalent area of SANG will need to be provided elsewhere. Existing surveys have indicated that Knowle Triangle and Fareham Common are of little intrinsic ecological value, apart from the SINC on Fareham Common. Therefore, when they are laid out as SANG they should both be able to fully contribute to providing an alternative natural greenspace for visitors. Visitor surveys should be carried out at all three sites (Dash Wood, Knowle Triangle and Fareham Common) to inform an assessment of how they are currently used and guide planned improvements to SANG standard.

5.3.44 It is further recommended that a continuing dialogue is established with the New Forest National Park regarding the ongoing studies it is undertaking to inform the Recreation Management Strategy. This should seek to establish whether, and at what point, any financial contribution towards implementing the RMS would be required, over and above the Welborne Plan's proposals for SANG and contributions to the SDMP avoidance and mitigation strategy.

5.4 Effects on Supporting Habitats

5.4.1 Whereas the Solent Disturbance and Mitigation Project seeks to manage impacts to overwintering birds within the SPA/Ramsars, the *Solent Waders and Brent Goose Strategy* (King, 2010) aims to avoid impacts to SPA species using land outside of the designated sites which have an important or uncertain role in supporting waders and Dark-bellied Brent goose at high-water. The Strategy promotes the protection of areas regularly used by these species, or which may become regularly used in the future, from development and increased recreational use through the planning system. Among its findings, the Strategy found that the area of buildings within 500m of a site had a significant role in making the site less suitable for Brent Goose and waders.

5.4.2 No sites identified within the Strategy as currently or potentially important to waders or Brent Goose fall within, or within 500m of, the Welborne boundary. However, a group of sites listed as important for Brent Goose in the earlier 2002 Strategy lie at Monument Farm, about 1km east of the policy boundary. According to the Strategy authors, the Monument Farm sites were included within the scope of the 2010 Strategy, but not visited by any of the volunteer surveyors. Similar sites on a comparable latitude to the east were visited; no Brent Geese were recorded, but not on a sufficient number of visits to be confident of classifying the sites as of "no recorded use". The distance of fields at Monument Farm, and indeed others within the Welborne boundary, from mean high water suggests that, if they are used at all by Brent Goose, it would probably only be during extreme winter weather. Additionally, such sites are only attractive to the birds when a food source is available i.e. winter wheat.

5.4.3 A winter bird survey was carried out in 2010/11 (Chris Blandford Associates; CBA, 2011) which included the entire area of search for the new community, plus a buffer of up to 2km (habitat-dependant). Surveys were carried out between October 2010 and March 2011; weather conditions were generally suitable but some visits had to be re-scheduled due to heavy snow fall. No Brent Goose were recorded, Curlew being the only species observed during the survey which is included on any of the European site citations as a qualifying feature (Chichester and Langstone Harbours SPA). Flocks of between seven and 40 individuals were periodically observed in the permanent pasture around North Fareham Farm and Pook Lane between early December and early February; see for example Figure 5.11. The fields represent some of the least disturbed habitat within the Welborne site due to a general absence of agricultural activities. They are currently allocated for use as a landscape buffer in the Strategic Framework Diagram for Welborne.

5.4.4 The absence of Brent goose, and indeed the overall limited ecological value of the site for wintering birds, is interpreted by CBA (2011, p.8) as being attributable to three main causes:

- "Distance from SPAs: it is conceivable that there are more suitable inland foraging areas closer to the SPAs than the Study Area. This would appear to be borne out by the survey maps accompanying the Brent Goose Strategy, which indicate, in general terms, that Brent geese are moving to suitable inland sites which are closer to the SPA than the Study Area;
- "Habitat suitability: Brent geese generally favour grasslands for foraging. Whilst the Study Area supports areas of grassland, particularly towards its northern and south eastern boundaries (along the A27 corridor), much of this is considered to be sub-optimal or unsuitable due to: field size, hedgerows, tree lines, woodland and agricultural uses (cattle grazing). Whilst arable crops may provide some foraging potential, it appears that the availability of suitable foraging areas closer to the coast may be a deciding factor;
- "Disturbance: it became evident during the survey that much of the Study Area is subject to regular disturbance. The three major forms of disturbance were:
    - General agricultural disturbance associated with crop management including, ploughing, sowing, periodic spraying, cattle movements etc.;
    - Crop protection, particularly in the form of gas cannons, but also including a variety of bird scarers; and
    - Recreational disturbance, such as dog walking and rambling, which was recorded to varying extents during each survey event."

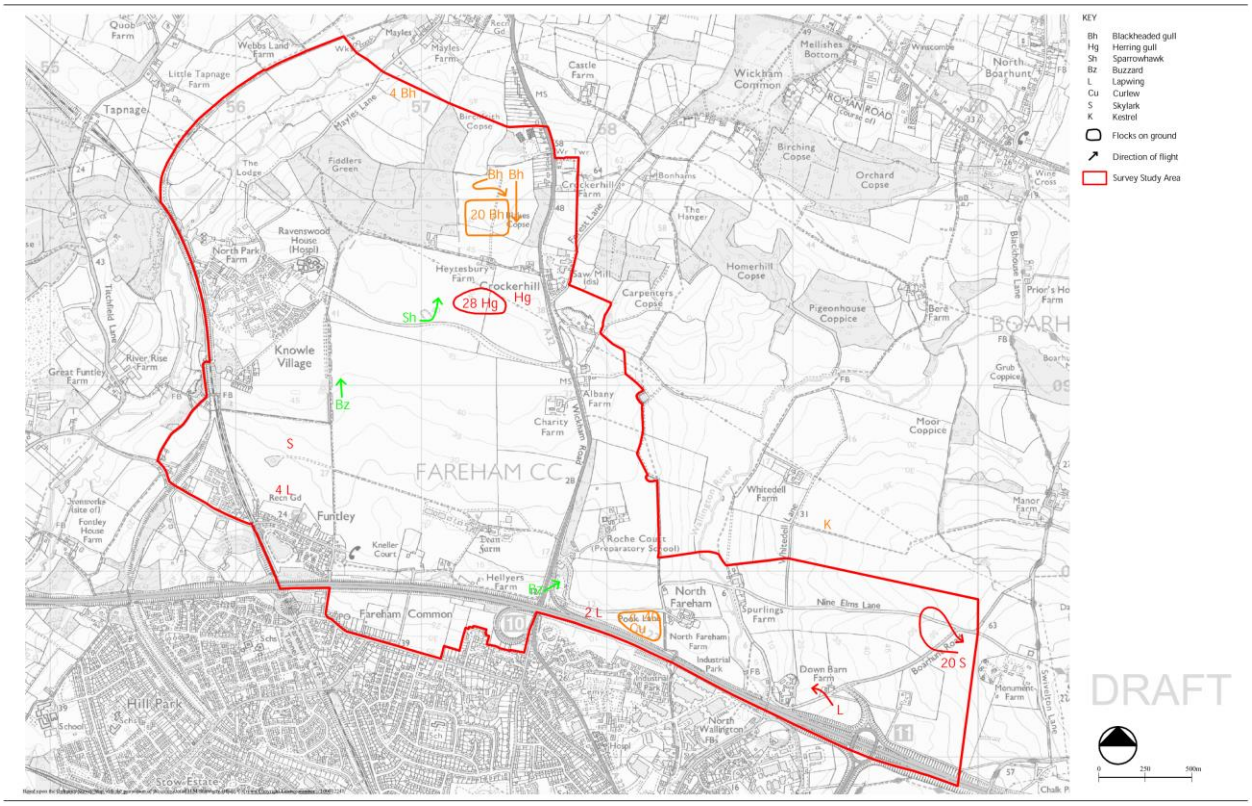

Figure 5.11: Winter bird survey, 8 December 2010 (Source: CBA, 2011)

Other plans and projects acting in combination

5.4.5 The following plans/projects identified at the screening stage may also contribute to the loss or degradation of supporting habitats:

- The Fareham Development Sites and Policies Plan
- Eastleigh Adopted Local Plan Review 2001-2011 (adopted 2006)
- Eastleigh Draft Local Plan (LDF) 2011-2029
- Winchester saved adopted policies in the Local Plan 2006
- Winchester Local Plan Part 1 - Joint Core Strategy (adopted 2013)
- Winchester emerging Local Plan Part 2 – Development Management and Allocations Document.
- Gosport Local Plan Review 2001 to 2016 (Adopted 2006)
- Gosport Borough Draft Local Plan 2011 to 2029
- Portsmouth City Local Plan saved policies (adopted 2006)
- The Portsmouth Plan (adopted 2012)
- Portsmouth AAPs (Somerstown and North Southsea AAP & Southsea Town Centre AAP)
- Portsmouth emerging Site Allocations DPD
- North Solent Shoreline Management Plan (December 2010)
- Joint Hampshire Minerals and Waste Plan (adopted 2013) (includes Portsmouth, Southampton, New Forest National Park and South Downs National Park)

Recommendations in relation to effects on supporting habitats

5.4.6 It is recommended that overwintering bird surveys within and adjacent to the Welborne policy boundary are continued to confirm that the level of use of the site by SPA/Ramsar species is not significant and/or is limited to areas such as the permanent pasture at Pook Lane (i.e. outside of the built footprint of the development). Surveys should build on the single season survey already undertaken, and continue for a total duration of at least three seasons.

5.5 Water Abstraction and Supply

5.5.1 Welborne falls within the Portsmouth Water supply zone. 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 which have all (except for the Meon) been subject to Water Framework Directive (WFD) investigations during the AMP5 period (2010 – 2015).

5.5.2 The Environment Agency's Review of Consents (RoC) under the Habitats Directive, completed in late 2007, determined sustainable levels of water abstraction and waste water discharge that can be met without adverse effects on the ecological integrity of European sites, including the marine habitats of the Solent system and freshwater habitats of its rivers. The chalk Rivers Test

and Itchen, fed by groundwater, supply substantial quantities of potable water, and abstractions from these systems alter the surface water regime, in turn impacting on important ecological receptors. There is a further freshwater requirement in maintaining ecological integrity of the intertidal zones of coastal sites.

5.5.3 In response to the RoC findings, Portsmouth Water accepted changes to its abstraction licences on the River Itchen (SAC), Havant and Bedhampton Springs and a group of Sussex licences (Chichester and Langstone Harbour SPA/Ramsar and Solent Maritime SAC) to protect European sites. These reductions are due to commence in 2015 and be introduced progressively over the following five years in accordance with a Memorandum of Understanding between Portsmouth Water, Southern Water, the Environment Agency and Ofwat.

5.5.4 In its Final Draft Water Resource Management Plan (WRMP) for 2014 Portsmouth Water has concluded that the Havant Thicket reservoir is no longer required. Revisions to demand forecasting indicate that, whilst the Company's supply area will see an increase in both properties and population over the planning period, the growth is not as high as estimated in the WRMP. As a result of this and other factors, Portsmouth Water calculates that the Baseline Supply/Demand Balance under Average Conditions offers a surplus of supply over demand throughout the planning period; see Figure 5.12. A surplus also exists for the Baseline Peak Week and the Baseline Minimum Deployable Output scenarios.

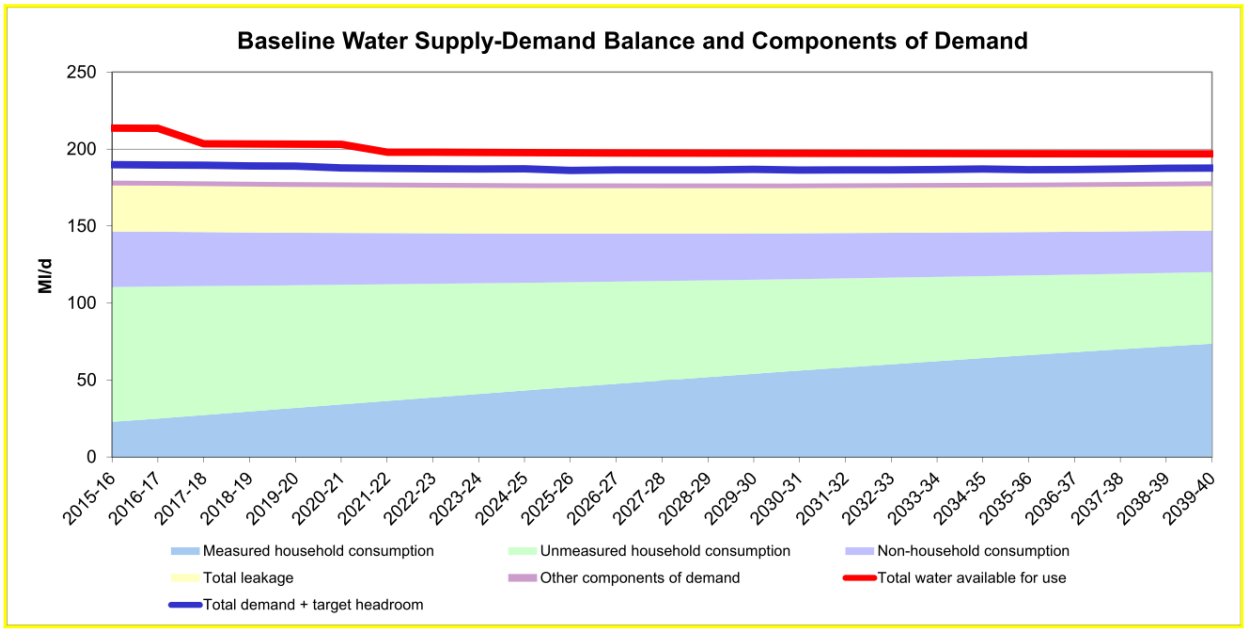

Figure 5.12: Portsmouth Waters' Baseline Water Supply-Demand Balance (Source: Portsmouth Water, 2013)

5.5.5 As Portsmouth Water's baseline supply-demand balance does not forecast a deficit over the planning period for Average, Peak and Minimum Deployable Output scenarios, the company is not seeking to promote any options for new supply or demand management. Its existing abstractions will continue within agreed parameters that were designed to protect the integrity of European sites in the region.

Other plans and projects acting in combination

5.5.6 The following plans/projects may also contribute to increasing water demand:

- The Fareham Development Sites and Policies Plan
- Eastleigh Adopted Local Plan Review 2001-2011 (adopted 2006)
- Eastleigh Draft Local Plan (LDF) 2011-2029
- Winchester saved adopted policies in the Local Plan 2006
- Winchester Local Plan Part 1 - Joint Core Strategy (adopted 2013)
- Winchester Local Plan Part 2 – Development Management and Allocations Document.
- Gosport Local Plan Review 2001 to 2016 (Adopted 2006)
- Gosport Borough Draft Local Plan 2011 to 2029
- Portsmouth City Local Plan saved policies (adopted 2006)
- The Portsmouth Plan (adopted 2012)
- Portsmouth AAPs (Somerstown and North Southsea AAP & Southsea Town Centre AAP)
- Portsmouth emerging Site Allocations DPD

5.6 Waste Water Treatment and Discharge

5.6.1 The ability of wastewater treatment works (WTW) to receive foul water is limited both by conveyance infrastructure capacity and technological capability to treat waste water to the quality standard required for safe discharge into aquatic and marine environments. 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 reduces dissolved oxygen content and impacts on food availability. 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.

5.6.2 The Environment Agency states that nitrogen is the most important constraint affecting WTWs in South Hampshire which discharge into the marine environment. Discharge consent limits are set by the Environment Agency, address both volume and pollutant load, and have been adjusted under the Review of Consents process to avoid adverse effects on European sites including Solent and Southampton Water SPA/Ramsar and Portsmouth Harbour SPA/Ramsar.

5.6.3 Natural England[14] recently met the Environment Agency (EA) to discuss water quality issues in Portsmouth Harbour and the wider Solent, and EA has shared preliminary results of

[14] Letter dated 9 December 2013 to Chris Payne, Head of Planning Policy, Gosport Borough Council, from Charles Routh, Lead Adviser, Winchester Land Use Operations Team, Natural England

investigations it has undertaken into the source of nutrients and macroalgal density. EA's preliminary results indicate that approximately 64% of nitrogen in Portsmouth Harbour as a whole comes from background marine sources, and 30% from rivers and diffuse sources. Only 6% is estimated to come from sewage treatment works within and outside of the harbour.

5.6.4 EA confirmed that macroalgal density across Portsmouth Harbour as a whole is below or close to targets for achieving favourable conservation status and good ecological potential under the Water Framework Directive. However, there are some parts of the harbour (for example in the River Wallington arm) where dense algal mats remain, and where reducing the impact and meeting targets will be challenging. In addition other related targets such as the extent of algal mats are not being met. However, it is believed that improvements in these measures will be achieved in the long term as a result of continued action to tackle pollution sources including planned (2015) improvements in sewage treatment works which have a small but nonetheless important influence on water quality of Portsmouth Harbour.

5.6.5 Action to reduce nutrient inputs to the Solent, including from diffuse sources, is ongoing, and EA's investigations will help to target effort in the right places. The 2015 River Basin Management Plan will chart the path to good ecological potential, which includes restoring the European designated sites to favourable conservation status. In light of this, and the relatively small contribution that sewage treatment works make to total nitrogen loads in Portsmouth Harbour, Natural England's view is that projected household growth within the existing sewage discharge licences will not compromise the actions which are being taken forward to reduce nitrogen loads in Portsmouth Harbour and the Solent.

5.6.6 Southern Water is the water company with responsibility for wastewater treatment in South Hampshire. Welborne falls within the catchment area of Southern Water's Peel Common WTW near Stubbington, which has a long sea outfall to the Solent. Evidence gathered in the baseline report suggests that sufficient capacity for waste water treatment is likely to exist at Peel Common works, despite the constraints placed on the works in relation to both volume and nitrogen loading. But it is accepted that there is a limit to the headroom available at Peel Common and, while other developments in the sub-region may seek to connect to the works, the available capacity will reduce over time. Options for sewerage connections to Peel Common are still being explored and, at present, it is not certain whether a feasible option exists.

5.6.7 The Environment Agency[15] has recently re-confirmed that the Review of Consents work carried out for Peel Common WTW took into account the full scale of residential growth planned for in the South East Plan (80,000 dwellings in South Hampshire). Around a third of the population growth associated with this was expected to come forward within Peel Common's catchment area (Atkins, 2009), including the two Strategic Development Areas at Hedge End and Welborne. Following revocation of the South East Plan, Hedge End is no longer being pursued and meanwhile the scale of residential growth at Welborne has reduced from up to 10,000 to around 6,000 dwellings. The RoC concluded that further measures would be required alongside the licenced discharge consent changes, to protect and restore European sites in Portsmouth Harbour and the Solent, as described by Natural England above.

[15] Email dated 20 December 2013 from Laura Lax, Environment Agency, Solent and South Downs Team.

5.6.8 Hence proposed growth in the Peel Common catchment area within these limits will be acceptable so long as Southern Water confirms that sufficient capacity is available within its consent. Southern Water has collected certified flow measurement data at Peel Common WWTW since 2008, and has reassessed the capacity available in the environmental permit. There is now evidence to demonstrate that nitrogen removal can be achieved to lower concentrations than previously estimated (i.e. lower than 9-10mg/l). On this basis, and assuming that the Agency would apply the no deterioration principle in the event that a new or amended permit is required, Southern Water considers that the environmental constraint identified in the PUSH IWMS (Atkins, 2009) at Peel Common has been removed.

5.6.9 An alternative approach to waste water treatment has been put forward by Albion Water, which has a treatment works at Knowle. The Knowle works discharges to the River Meon which in turn leads to designated habitats at Titchfield Haven, part of the Solent and Southampton Water SPA/Ramsar. The proposal is that sewage could be treated at an enlarged Knowle works, with black water being recycled back into the new community for use in toilet flushing, etc. Albion Water has stated that the existing sewerage assets, the sewage treatment works and discharge consent are able to accommodate some additional flows but it is envisaged that major upgrades and/or additional capacity would be required by 2018, and existing adopted 'strategic' sewers and pumping station would require reinforcement. Any upgrades to enlarge treatment capacity at Knowle WTW would need to operate within the existing discharge consent limits. The company emphasises that its water services would include the provision of non-potable water to meet sanitary and irrigation requirements across the site.

5.6.10 The preferred solution for waste water treatment is not yet known, and so cannot be fully assessed at the current time. The feasibility of both options would need to be explored in greater detail. The issue will be taken forward for further analysis at the planning application stage.

Other plans and projects acting in combination

5.6.11 The following plans/projects identified at the screening stage may also contribute to waste water flows to Peel Common:

- The Fareham Development Sites and Policies Plan
- Eastleigh Adopted Local Plan Review 2001-2011 (adopted 2006)
- Eastleigh Draft Local Plan (LDF) 2011-2029
- Gosport Local Plan Review 2001 to 2016 (Adopted 2006)
- Gosport Borough Draft Local Plan 2011 to 2029

Recommendations in relation to wastewater treatment and discharge

5.6.12 It is recommended that feasibility studies are undertaken to establish which WWTW option is preferred, or whether a combination of the two approaches could be utilised. Studies should include within their objectives the need to confirm that the preferred option would be capable of meeting the required environmental standards for discharge, as stipulated by proposed policy WEL37.

6 Impact Assessment

6.1 Introduction

6.1.1 This chapter assesses whether proposed development at Welborne can be expected to adversely affect the ecological integrity of any of the European sites screened into the assessment. It does this by considering each of the sites' conservation objectives (Table 3.2), in the context of available data on the impact pathways outlined in Chapter 5, and with reference to the characteristics of each site (Chapter 4) and their qualifying features (Chapter 3).

6.1.2 The impact assessment draws on traffic modelling which has been undertaken using the Sub-Regional Transport Model for south Hampshire. The model has been used to assess the impacts of development at Welborne, and associated works to junction 10 of the M27, upon the surrounding road network, including roads in close proximity to European sites. The Welborne Plan makes it clear that there are a number of options for junction 10. It should be noted that the model outputs described in this section relate to one of the options modelled to date and provide an initial indication of the likely traffic impacts of the development.

6.2 Butser Hill SAC

6.2.1 Butser Hill SAC was screened into the HRA because of concerns that it could be adversely affected by atmospheric pollution. However, traffic modelling data (Appendix IV) show that post-development two-way traffic flows on the A3(M) are predicted to decrease by -217 AADT in 2036.

Objective 1: Extent and distribution of qualifying natural habitats and habitats of qualifying species

6.2.2 The Butser Hill SAC is designated as an SAC due to the presence of two Annex 1 habitat types described in Section 4.3 of this report. These habitats are; semi-natural dry grassland and scrubland facies on calcareous substrates *Festuco-Brometalia* and Yew *Taxus baccata* woods of the British Isles (which are a priority feature). There are no qualifying species associated with the SAC. Due to the predicted decrease in traffic flow along the A3(M) in 2036 following implementation of the Welborne Plan, it can be concluded that there will be no adverse effect on the extent and distribution of qualifying natural habitats at this site.

Objective 2: Structure and function (including typical species) of qualifying natural habitats and habitats of qualifying species

6.2.3 Due to the predicted decrease in traffic flow, it is not considered that there will be an adverse effect from pollution impacts on the structure and function of the qualifying natural habitats of Butser Hill SAC.

Objective 3: Supporting processes on which qualifying natural habitats and habitats of qualifying species rely

6.2.4 Due to the predicted decrease in traffic flow, it is not considered that there will be an adverse effect from pollution impacts on the supporting processes on which qualifying natural habitats of Butser Hill SAC rely.

Objective 4: Populations of qualifying species

6.2.5 There are no qualifying species associated with the designation of the Butser Hill SAC.

Objective 5: Distribution of qualifying species within the site

6.2.6 There are no qualifying species associated with the designation of the Butser Hill SAC.

Conclusions regarding adverse effects on integrity

6.2.7 It can be concluded that the Welborne Plan will not result in adverse effects on the ecological integrity of the Butser Hill SAC.

6.3 New Forest SAC/Ramsar

6.3.1 The New Forest SAC/Ramsar were screened into the HRA because of concerns that they could be adversely affected by atmospheric pollution. However, traffic modelling data (Appendix IV) show that post-development two-way traffic flows on the M27 J1 to J2, A35, A36, A31 and Roger Penn Way (at locations 4, 5, 6, 7 and 8 on Figure 5.3) are predicted to decrease in 2036.

Objective 1: Extent and distribution of qualifying natural habitats and habitats of qualifying species

6.3.2 The New Forest SAC/Ramsar site is designated due to the presence of twelve Annex 1 habitat types described in Section 4.3 of this report. These habitats are; oligotrophic waters containing very few minerals of sandy plains (*Littorelletalia uniflorae*), Oligotrophic to mesotrophic standing waters with vegetation of the *Littorelletea uniflorae* and/or of the *Isoëto-Nanojuncetea*, Northern Atlantic wet heaths with *Erica tetralix,* European dry heaths, *Molinia* meadows on calcareous, peaty or clayey-silt-laden soils (*Molinion caeruleae*), depressions on peat substrates of the *Rhynchosporion,* Atlantic acidophilous beech forests with *Ilex* and sometimes also *Taxus* in the shrublayer (*Quercion robori-petraeae* or *Ilici-Fagenion, Asperulo-Fagetum* beech forests, Old acidophilous oak woods with *Quercus robur* on sandy plains, bog woodland (Priority habitat), alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion*, *Alnion incanae*, *Salicion albae)* (Priority habitat), and transition mires and quaking bogs. Due to the predicted post-development decrease in traffic flow along the M27 J1 to J2, A35, A36, A31 and Roger Penn Way, it can be concluded that there will be no adverse effect on the extent and distribution of qualifying natural habitats at this site.

6.3.3 The New Forest SAC/Ramsar is also designated due to the presence of the following qualifying species described in Section 4.2 of this report; Southern Damselfly, Stag Beetle and Great

Crested Newt. Due to the predicted post-development decrease in traffic flow, it is not considered that there will be an adverse effect from pollution impacts on the extent and distribution of the habitats of any qualifying species of the New Forest SAC/Ramsar.

Objective 2: Structure and function (including typical species) of qualifying natural habitats and habitats of qualifying species

6.3.4 Due to the predicted post-development decrease in traffic flow, it is not considered that there will be an adverse effect from pollution impacts on the structure and function of the qualifying natural habitats of the New Forest SAC/Ramsar or on the habitats of any of its qualifying species.

Objective 3: Supporting processes on which qualifying natural habitats and habitats of qualifying species rely

6.3.5 Due to the predicted post-development decrease in traffic flow, it is not considered that there will be an adverse effect from pollution impacts on the supporting processes on which the qualifying natural habitats of the New Forest SAC/Ramsar rely. Furthermore there are predicted to be no adverse effects on the habitats of qualifying species as a result of the plan.

Objective 4: Populations of qualifying species

6.3.6 Due to the predicted post-development decrease in traffic flow, it is not considered that there will be an adverse effect from pollution impacts on the populations of qualifying species within the New Forest SAC/Ramsar.

Objective 5: Distribution of qualifying species within the site

6.3.7 Due to the predicted post-development decrease in traffic flow, it is not considered that there will be an adverse effect from pollution impacts on the distributions of qualifying species within the New Forest SAC/Ramsar.

Conclusions regarding adverse effects on integrity

6.3.8 It can be concluded that the Welborne Plan will not result in adverse effects on the ecological integrity of the New Forest SAC/Ramsar.

6.4 River Itchen SAC

6.4.1 River Itchen SAC was screened into the HRA because of concerns that it could be adversely affected by atmospheric pollution and impacts related to water abstraction and supply. Traffic modelling data (Appendix IV) show that post-development two-way traffic flows on the M27, M3, A272 and A34 close to the river (at locations 9, 10, 11 and 12 on Figure 5.3) are predicted to mainly decrease in 2036. Some minor increases are also predicted but these are limited to less than 50 AADT vehicle movements.

6.4.2 Licensing changes are being implemented to return abstraction to sustainable levels and protect the qualifying habitats and species of the River Itchen SAC. Portsmouth Water's Final

Draft Water Resource Management Plan for 2014 shows that baseline supply-demand balance does not forecast a deficit over the planning period for Average, Peak and Minimum Deployable Output scenarios, and the company is not seeking to promote any options for new supply or demand management. Its existing abstractions will continue within agreed parameters that were designed to protect the integrity of European sites in the region.

Objective 1: Extent and distribution of qualifying natural habitats and habitats of qualifying species

6.4.3 The Itchen is designated as a classic example of a sub-type 1 chalk river, which is dominated throughout by aquatic *Ranunculus* spp vegetation. The Itchen also supports the following qualifying species which are a primary reason for the selection of this site as an SAC. These are described in Section 4.2 of this report and include: White-clawed Crayfish, Southern Damselfly, Bullhead, Brook Lamprey, Otter and Atlantic Salmon. The WRMP shows there to be sufficient water supply over the planning period. Predicted traffic flows are expected to decrease close to the river despite development under the Welborne Plan. As a result there are no predicted adverse effects on the extent and distribution of qualifying natural habitats and habitats of qualifying species.

Objective 2: Structure and function (including typical species) of qualifying natural habitats and habitats of qualifying species

6.4.4 Due to the predicted post-development decrease in traffic flow, and the return of abstraction to sustainable levels, it is not considered that there will be an adverse effect on the structure and function of the qualifying natural habitats of the River Itchen SAC, or on the habitats of its qualifying species.

Objective 3: Supporting processes on which qualifying natural habitats and habitats of qualifying species rely

6.4.5 Due to the predicted post-development decrease in traffic flow, and the return of abstraction to sustainable levels, it is not considered that there will be an adverse effect on the supporting processes on which the qualifying natural habitats of the River Itchen SAC rely. Neither are any adverse effects predicted on the habitats of its qualifying species as a result of the Welborne Plan.

Objective 4: Populations of qualifying species

6.4.6 Due to the predicted post-development decrease in traffic flow, and the return of abstraction to sustainable levels, it is not considered that there will be an adverse effect on the populations of qualifying species for which the River Itchen SAC is designated.

Objective 5: Distribution of qualifying species within the site

6.4.7 Due to the predicted post-development decrease in traffic flow, and the return of abstraction to sustainable levels, it is not considered that there will be an adverse effect on the distribution of qualifying species for which the River Itchen SAC is designated.

Conclusions regarding adverse effects on integrity

6.4.8 It can be concluded that the Welborne Plan will not result in adverse effects on the ecological integrity of the River Itchen SAC.

6.5 Solent Maritime SAC

6.5.1 Solent Maritime SAC was screened into the HRA because of concerns that it could be adversely affected by atmospheric pollution and impacts related waste water treatment and discharge. Traffic modelling data (Appendix IV) show that post-development two-way traffic flows on the M27, A2030, A3023 close to the SAC (at locations 18, 19, 20 and 21 on Figure 5.3) are predicted to mainly decrease in 2036. The major exception to this is where the M27 crosses the Hamble between junctions 8 and 9. However, given the low sensitivity of intertidal mudflat and coastal saltmarsh habitats to atmospheric nitrogen inputs, and their locations in the Hamble estuary relative to the M27 and the SAC boundary, it is concluded that adverse effects on the integrity of the SAC is unlikely to result from increasing traffic flows at this location.

6.5.2 There appears to be a reasonably good degree of confidence that Peel Common wastewater treatment works would have the capacity to treat effluent to the standards required by its current discharge consent, if Southern Water is eventually selected as the preferred wastewater treatment provider for Welborne. It is not currently known whether Knowle treatment works could be sufficiently upgraded to continue operating within its discharge consent limits if it was selected as the preferred option. The preferred solution for waste water treatment is not yet known, and so cannot be fully assessed at the current time. The issue will be taken forward for further analysis at the planning application stage.

Objective 1: Extent and distribution of qualifying natural habitats and habitats of qualifying species

6.5.3 The Solent Maritime SAC site is designated due to the presence of ten Annex 1 habitat types which are described in Section 4.3 of this report. These are: Estuaries, *Spartina* swards, Atlantic salt meadows, Sandbanks which are slightly covered by water at all times, Mudflats and sandbanks not covered by water at all times, Coastal lagoons (a priority feature), Annual vegetation of drift lines, Perennial vegetation of stony banks, *Salicornia* and other annuals colonising mud and sand, and Shifting dunes along the shoreline with *Ammophila arenaria*. The site also supports Desmoulin's Whorl Snail which is an Annex II species listed as a qualifying feature of the SAC. Given the predicted post-development decrease in traffic flow along the M27, A2030, A3023 close to the SAC, it can be concluded that there will be no adverse effect on the extent and distribution of qualifying natural habitats at this site or on the habitats of qualifying species.

6.5.4 There is reasonable confidence that Peel Common wastewater treatment works has sufficient capacity to treat the volume of effluent that would be received from Welborne to the standards required by the current discharge consent, and as a result there would be no predicted adverse effects on the extent and distribution of qualifying natural habitats or the habitats of qualifying species. However, it is not currently known which option will be preferred, nor whether Knowle

treatment works can be sufficiently upgraded to ensure no adverse effects if taken forward. Adverse effects from elevated pollutant loads within wastewater discharges cannot therefore be ruled out with confidence at this stage. Further project-level HRA will be required at the outline planning application stage to demonstrate that, whichever option is ultimately preferred, there are no adverse effects on the extent and distribution of qualifying natural habitats and habitats of qualifying species.

Objective 2: Structure and function (including typical species) of qualifying natural habitats and habitats of qualifying species

6.5.5 Given the predicted post-development decrease in traffic flow, it is not considered that there will be an adverse effect on the structure and function of the qualifying natural habitats of the Solent Maritime SAC, nor on the habitats of its qualifying species.

6.5.6 However until further project-level HRA is undertaken regarding the proposed wastewater treatment options, it cannot currently be concluded that the development of Welborne will not adversely affect the structure and function of the qualifying natural habitats, or the habitats of qualifying species, as a result of wastewater treatment and discharge.

Objective 3: Supporting processes on which qualifying natural habitats and habitats of qualifying species rely

6.5.7 Given the predicted post-development decrease in traffic flow, it is not considered that there will be an adverse effect on the supporting processes on which the qualifying natural habitats of the Solent Maritime SAC rely, nor on the habitats of its qualifying species.

6.5.8 It cannot currently be concluded that the development of Welborne will not adversely affect the supporting processes on which qualifying natural habitats, and habitats of qualifying species, rely as a result of wastewater treatment and discharge.

Objective 4: Populations of qualifying species

6.5.9 Given the predicted post-development decrease in traffic flow, it is not considered that there will be an adverse effect on the populations of the qualifying species for which the Solent Maritime SAC is designated.

6.5.10 It cannot currently be concluded that the development of Welborne will not adversely affect the populations of qualifying species for which the SAC was designated, as a result of wastewater treatment and discharge.

Objective 5: Distribution of qualifying species within the site

6.5.11 Given the predicted post-development decrease in traffic flow, it is not considered that there will be an adverse effect on the distributions of the qualifying species for which the Solent Maritime SAC is designated.

6.5.12 It cannot currently be concluded that the development of Welborne will not adversely affect the distributions of qualifying species within the SAC, as a result of wastewater treatment and discharge.

Conclusions regarding adverse effects on integrity

6.5.13 With regards air pollution impacts, it can be concluded that the Welborne Plan will not result in adverse effects on the ecological integrity of the Solent Maritime SAC.

6.5.14 However, there is currently uncertainty regarding the potential for wastewater treatment and discharge impacts on the Solent Maritime SAC, and it cannot currently be concluded that the development of Welborne will not adversely affect the ecological integrity of the site.

6.6 Chichester and Langstone Harbours SPA/Ramsar

6.6.1 Chichester and Langstone Harbours SPA/Ramsar were screened into the HRA because of concerns that they could be adversely affected by atmospheric pollution, disturbance impacts and effects on supporting habitats. Traffic modelling data (Appendix IV) show that post-development two-way traffic flows on the M27, A2030, A3023 close to the SPA/Ramsar (at locations 18, 19 and 20 on Figure 5.3) are predicted to mainly decrease in 2036. Some minor increases are also predicted but these are limited to less than 20 AADT vehicle movements.

6.6.2 The Solent Disturbance and Mitigation Project provides evidence that new residential developments within 5.6km of the Solent coastline could adversely affect the integrity of the SPA/Ramsar by increasing disturbance to overwintering birds. The Welborne Plan acknowledges this and sets out a potential strategy for delivering 70.5ha of off-site SANG at Dash Wood, Knowle Triangle and Fareham Common, an additional 14ha of on-site SANG (GI performing dual role), and a financial contribution of approximately £675,000 towards delivering the SDMP avoidance and mitigation strategy, unless a more effective strategy can be agreed by both the Council and Natural England. It further requires that governance arrangements for green infrastructure are established to ensure it is suitably managed and maintained in perpetuity, and that GI and SANG should be phased throughout the development programme in line with the rate of residential completions. It is concluded that the Welborne Plan sets out an adequate response to the risk of disturbance impacts and, while it retains a degree of flexibility over final arrangements as the plan moves forward, demonstrates that opportunities to avoid and mitigate adverse disturbance effects are available.

6.6.3 Turning to supporting habitats for the SPA/Ramsar, surveys carried out between October 2010 and March 2011 did not record any sightings of Brent Goose within the site. Curlew was the only species observed which is included on any of the European site citations as a qualifying feature (Chichester and Langstone Harbours SPA). Flocks of between seven and 40 individuals were periodically observed in the permanent pasture around North Fareham Farm and Pook Lane between early December and early February. The area is currently allocated for use as a landscape buffer in the Strategic Framework Diagram for Welborne. Furthermore, the policy area boundary has been adjusted to exclude fields around Monument Farm which have previously been observed to support Brent Goose.

Objective 1: Extent and distribution of the habitats of the qualifying features

6.6.4 The Chichester and Langstone Harbours is designated as an SPA due to the presence of the following bird species listed under Annex I of the Birds Directive: Little Tern, Sandwich Tern, Common Tern, Little Egret and Bar-tailed Godwit. It also supports overwintering populations of European importance of the following migratory species: Dark-bellied Brent Goose, Dunlin, Grey Plover, Redshank, Ringed Plover, Wigeon, Pintail, Shoveler, Teal, Turnstone, Sanderling, Shelduck, Curlew and Red-breasted Merganser. The Ramsar citation further includes migratory Black-tailed Godwit. Given the predicted post-development decreases in traffic flow on the majority of roads close to the SPA (M27, A2030, A3023), together with some small but not significant increases, it is not considered that there will be an adverse effect on the extent and distribution of the habitats of qualifying species.

6.6.5 As a result of the SANGs planned for Welborne, together with contributions towards delivering the SDMP, it is concluded that there will be no adverse effects on the extent and distribution of the habitats of the qualifying species as a result of disturbance.

6.6.6 The allocation of land within Welborne is not considered to adversely affect the extent and distribution of supporting habitats for qualifying species outside of the SPA/Ramsar boundaries.

Objective 2: Structure and function of the habitats of the qualifying features

6.6.7 Given the predicted post-development decreases in traffic flow on the majority of roads close to the SPA/Ramsar, it is not considered that there will be an adverse effect on the structure and function of the habitats of qualifying species.

6.6.8 The commitment towards delivering SANG and contributions to the SDMP is considered to demonstrate that sufficient measures are available to ensure that there will be no adverse effect on the structure and function of the habitats of qualifying species as a result of increased disturbance impacts.

6.6.9 The allocation of land within Welborne is not considered to adversely affect the structure and function of supporting habitats for qualifying species outside of the SPA/Ramsar boundaries.

Objective 3: Supporting processes on which the habitats of the qualifying features rely

6.6.10 Given the predicted post-development decreases in traffic flow on the majority of roads close to the SPA/Ramsar, it is not considered that there will be an adverse effect on the supporting processes on which the habitats of qualifying species rely.

6.6.11 The commitment towards delivering SANG and contributions to the SDMP is considered to demonstrate that sufficient measures are available to ensure that there will be no adverse effect on the supporting processes on which the habitats of qualifying species rely as a result of increased disturbance impacts.

6.6.12 The allocation of land within Welborne is not considered to adversely affect the supporting processes on which the habitats for qualifying species outside of the SPA/Ramsar boundaries rely.

Objective 4: Populations of the qualifying features

6.6.13 Given the predicted post-development decreases in traffic flow on the majority of roads close to the SPA/Ramsar, it is not considered that there will be an adverse effect on the populations of qualifying species.

6.6.14 The commitment towards delivering SANG and contributions to the SDMP is considered to demonstrate that sufficient measures are available to ensure that there will be no adverse effect on the populations of qualifying species as a result of increased disturbance impacts.

6.6.15 The allocation of land within Welborne is not considered to adversely affect the populations of qualifying species outside of the SPA/Ramsar boundaries.

Objective 5: Distribution of qualifying features within the site

6.6.16 Given the predicted post-development decreases in traffic flow on the majority of roads close to the SPA/Ramsar, it is not considered that there will be an adverse effect on the distribution of qualifying species within the site.

6.6.17 The commitment towards delivering SANG and contributions to the SDMP is considered to demonstrate that sufficient measures are available to ensure that there will be no adverse effect on the distributions of qualifying species within the site as a result of increased disturbance impacts.

Conclusions regarding adverse effects on integrity

6.6.18 It can be concluded that the Welborne Plan will not result in adverse effects on the ecological integrity of the Chichester and Langstone Harbours SPA/Ramsar.

6.7 New Forest SPA

6.7.1 The New Forest SPA was screened into the HRA because of concerns that it could be adversely affected by atmospheric pollution and disturbance impacts. However, traffic modelling data (Appendix IV) show that post-development two-way traffic flows on the M27 J1 to J2, A35, A36, A31 and Roger Penn Way (at locations 4, 5, 6, 7 and 8 on Figure 5.3) are predicted to decrease in 2036.

6.7.2 It is likely that the population of Welborne will contribute to future visitor numbers within the New Forest because of its special qualities and National Park designation, although it has not been possible to demonstrate this because visitor survey data has not been forthcoming. However, given the distance of the New Forest from Welborne these visits are likely to be far fewer in number than those visiting the coast. Having established the principle of providing approximately 84ha of SANG at Welborne to meet the daily walking and dog walking needs of future Welborne residents, it is considered that the majority of potential impacts on the New Forest would also be avoided. Financial contributions to the New Forest Recreation Management Strategy could be agreed in the same way that the Welborne SANGs will be supplemented by a financial contribution to the SDMP, if the additional studies being carried

out as part of the RMS show this to be necessary. It is concluded that the Welborne Plan sets out an adequate response to the risk of disturbance impacts and, while it retains a degree of flexibility over final arrangements as the plan moves forward, demonstrates that opportunities to avoid and mitigate adverse disturbance effects are available.

Objective 1: Extent and distribution of the habitats of the qualifying features

6.7.3 The New Forest is designated as an SPA due to the presence of the following species of breeding birds listed under Annex I of the Birds Directive: Dartford Warbler, Honey Buzzard, Woodlark and Nightjar. It also supports an important population of overwintering Hen Harrier. Given the predicted post-development decreases in traffic flow on roads close to the SPA, it is not considered that there will be an adverse effect on the extent and distribution of the habitats of qualifying species.

6.7.4 Having established the principle of providing approximately 84ha of SANG at Welborne to meet the daily walking and dog walking needs of future Welborne residents, it is considered that there are unlikely to be adverse effects on the extent and distribution of the habitats of the qualifying species of the SPA as a result of disturbance.

Objective 2: Structure and function of the habitats of the qualifying features

6.7.5 Given the predicted post-development decreases in traffic flow on roads close to the SPA, it is not considered that there will be an adverse effect on the structure and function of the habitats of qualifying species.

6.7.6 Having established the principle of providing approximately 84ha of SANG at Welborne to meet the daily walking and dog walking needs of future Welborne residents, it is considered that there are unlikely to be adverse effects on the structure and function of the habitats of the qualifying species of the SPA as a result of disturbance.

Objective 3: Supporting processes on which the habitats of the qualifying features rely

6.7.7 Given the predicted post-development decreases in traffic flow on roads close to the SPA, it is not considered that there will be an adverse effect from pollution impacts on the supporting processes on which the habitats of the New Forest SPA qualifying species rely.

6.7.8 Having established the principle of providing approximately 84ha of SANG at Welborne to meet the daily walking and dog walking needs of future Welborne residents, it is considered that there are unlikely to be adverse effects on the supporting processes on which the habitats of the qualifying species of the SPA rely, as a result of disturbance impacts.

Objective 4: Populations of the qualifying features

6.7.9 Given the predicted post-development decreases in traffic flow on roads close to the SPA, it is not considered that there will be an adverse effect from pollution impacts on the populations of the qualifying species of the New Forest SPA.

6.7.10 As a result of the SANG provisions set out in the Welborne Plan, it is concluded that there will be no adverse effects on the populations of qualifying species of the New Forest SPA.

Objective 5: Distribution of qualifying features within the site

6.7.11 Given the predicted post-development decreases in traffic flow on roads close to the SPA, it is not considered that there will be an adverse effect from pollution impacts on the distributions of the qualifying species within the New Forest SPA.

6.7.12 As a result of the SANG provisions set out in the Welborne Plan, it is concluded that there will be no adverse effects on the distributions of qualifying species within the New Forest SPA.

Conclusions regarding adverse effects on integrity

6.7.13 It can be concluded that the Welborne Plan will not result in adverse effects on the ecological integrity of the New Forest SPA.

6.8 Portsmouth Harbour SPA/Ramsar

6.8.1 Portsmouth Harbour SPA/Ramsar were screened into the HRA because of concerns that they could be adversely affected by atmospheric pollution, disturbance impacts, and effects on supporting habitats. Traffic modelling data (Appendix IV) show that post-development two-way traffic flows on the M27, M275, A27, A27/A32 and South Street close to the SPA/Ramsar (at locations 13, 14, 15, 16 and 17 on Figure 5.3) are predicted to increase in some locations by 2036, and to decrease in other locations. Generally speaking, increases in traffic flow are predicted to be relatively minor and are limited to less than 200 AADT two-way vehicle movements. The exception to this is the A27 at Paulsgrove Lake, Portchester where traffic flow is expected to increase by 924 AADT two-way vehicle movements. However, this nonetheless falls below the 1,000 AADT threshold given in DMRB guidance, under which further detailed assessment is not considered to be required.

6.8.2 The Solent Disturbance and Mitigation Project provides evidence that new residential developments within 5.6km of the Solent coastline could adversely affect the integrity of the SPA/Ramsar by increasing disturbance to overwintering birds. The Welborne Plan acknowledges this and sets out a potential strategy for delivering 70.5ha of off-site SANG at Dash Wood, Knowle Triangle and Fareham Common, an additional 14ha of on-site SANG (GI performing dual role), and a financial contribution of approximately £675,000 towards delivering the SDMP avoidance and mitigation strategy, unless a more effective strategy can be agreed by both the Council and Natural England. It further requires that governance arrangements for green infrastructure are established to ensure it is suitably managed and maintained in perpetuity, and that GI and SANG should be phased throughout the development programme in line with the rate of residential completions. It is concluded that the Welborne Plan sets out an adequate response to the risk of disturbance impacts and, while it retains a degree of flexibility over final arrangements as the plan moves forward, demonstrates that opportunities to avoid and mitigate adverse disturbance effects are available.

6.8.3 Turning to supporting habitats for the SPA/Ramsar, surveys carried out between October 2010 and March 2011 did not record any sightings of Brent Goose within the site. Curlew was the only species observed which is included on any of the European site citations as a qualifying feature (Chichester and Langstone Harbours SPA). Flocks of between seven and 40 individuals were periodically observed in the permanent pasture around North Fareham Farm and Pook Lane between early December and early February. The area is currently allocated for use as a landscape buffer in the Strategic Framework Diagram for Welborne. Furthermore, the policy area boundary has been adjusted to exclude fields around Monument Farm which have previously been observed to support Brent Goose.

Objective 1: Extent and distribution of the habitats of the qualifying features

6.8.4 Portsmouth Harbour is designated as an SPA/Ramsar because of its overwintering populations of European importance of the following bird species: Dark-bellied Brent Goose, Dunlin, Black-tailed Godwit and Red-breasted Merganser. Predicted increases in traffic flow are relatively minor on the majority of the roads close to the SPA with the exception of the A27. However traffic increases on the A27 are still predicted to fall below the threshold where further assessment would be required. As a result there are no predicted adverse effects to the extent and distribution of the habitats of the qualifying species as a result of pollution impacts.

6.8.5 As a result of the SANGs planned for Welborne, together with contributions towards delivering the SDMP, it is concluded that there will be no adverse effects on the extent and distribution of the habitats of the qualifying species as a result of disturbance.

6.8.6 The allocation of land within Welborne is not considered to adversely affect the extent and distribution of supporting habitats for qualifying species outside of the SPA/Ramsar boundaries.

Objective 2: Structure and function of the habitats of the qualifying features

6.8.7 Predicted increases in traffic flow are relatively minor on the majority of the roads close to the SPA. As a result there are no predicted adverse effects to the structure and function of the habitats of the qualifying species as a result of pollution impacts.

6.8.8 As a result of the SANGs planned for Welborne, together with contributions towards delivering the SDMP, it is concluded that there will be no adverse effects on the structure and function of the habitats of the qualifying species as a result of disturbance.

6.8.9 The allocation of land within Welborne is not considered to adversely affect the structure and function of supporting habitats for qualifying species outside of the SPA/Ramsar boundaries.

Objective 3: Supporting processes on which the habitats of the qualifying features rely

6.8.10 Predicted increases in traffic flow are relatively minor on the majority of the roads close to the SPA. As a result there are no predicted adverse effects to the supporting processes on which the habitats of the qualifying species rely as a result of pollution impacts.

6.8.11 The commitment towards delivering SANG and contributions to the SDMP is considered to demonstrate that sufficient measures are available to ensure that there will be no adverse effect

on the supporting processes on which the habitats of qualifying species rely as a result of increased disturbance impacts.

6.8.12 The allocation of land within Welborne is not considered to adversely affect the supporting processes on which the habitats for qualifying species outside of the SPA/Ramsar boundaries rely.

Objective 4: Populations of the qualifying features

6.8.13 Predicted increases in traffic flow are relatively minor on the majority of the roads close to the SPA. It is not considered that there will be an adverse effect on the populations of the qualifying species of the Portsmouth Harbour SPA/Ramsar.

6.8.14 The commitment towards delivering SANG and contributions to the SDMP is considered to demonstrate that sufficient measures are available to ensure that there will be no adverse effect on the populations of qualifying species as a result of increased disturbance impacts.

6.8.15 The allocation of land within Welborne is not considered to adversely affect the populations of qualifying species outside of the SPA/Ramsar boundaries.

Objective 5: Distribution of qualifying features within the site

6.8.16 Predicted increases in traffic flow are relatively minor on the majority of the roads close to the SPA. It is not considered that there will be an adverse effect on the distributions of the qualifying species of the Portsmouth Harbour SPA/Ramsar.

6.8.17 The commitment towards delivering SANG and contributions to the SDMP is considered to demonstrate that sufficient measures are available to ensure that there will be no adverse effect on the distributions of qualifying species within the site as a result of increased disturbance impacts.

Conclusions regarding adverse effects on integrity

6.8.18 It can be concluded that the Welborne Plan will not result in adverse effects on the ecological integrity of the Portsmouth Harbour SPA/Ramsar.

6.9 Solent and Southampton Water SPA/Ramsar

6.9.1 Solent and Southampton Water SPA/Ramsar were screened into the HRA because of concerns that they could be adversely affected by atmospheric pollution, disturbance impacts, effects on supporting habitats and impacts related to waste water treatment and discharge. Traffic modelling data (Appendix IV) show that post-development two-way traffic flows on Fort Road, Gosport and Titchfield Road close to the SPA/Ramsar (at locations 1 (Ramsar only) and 2 on Figure 5.3) are predicted to mainly decrease in 2036. An increase of less than 50 AADT is predicted for Titchfield Road.

6.9.2 The Solent Disturbance and Mitigation Project provides evidence that new residential developments within 5.6km of the Solent coastline could adversely affect the integrity of the

SPA/Ramsar by increasing disturbance to overwintering birds. The Welborne Plan acknowledges this and sets out a potential strategy for delivering 70.5ha of off-site SANG at Dash Wood, Knowle Triangle and Fareham Common, an additional 14ha of on-site SANG (GI performing dual role), and a financial contribution of approximately £675,000 towards delivering the SDMP avoidance and mitigation strategy, unless a more effective strategy can be agreed by both the Council and Natural England. It further requires that governance arrangements for green infrastructure are established to ensure it is suitably managed and maintained in perpetuity, and that GI and SANG should be phased throughout the development programme in line with the rate of residential completions. It is concluded that the Welborne Plan sets out an adequate response to the risk of disturbance impacts and, while it retains a degree of flexibility over final arrangements as the plan moves forward, demonstrates that opportunities to avoid and mitigate adverse disturbance effects are available.

6.9.3 Turning to supporting habitats for the SPA/Ramsar, surveys carried out between October 2010 and March 2011 did not record any sightings of Brent Goose within the site. Curlew was the only species observed which is included on any of the European site citations as a qualifying feature (Chichester and Langstone Harbours SPA). Flocks of between seven and 40 individuals were periodically observed in the permanent pasture around North Fareham Farm and Pook Lane between early December and early February. The area is currently allocated for use as a landscape buffer in the Strategic Framework Diagram for Welborne. Furthermore, the policy area boundary has been adjusted to exclude fields around Monument Farm which have previously been observed to support Brent Goose.

6.9.4 There appears to be a reasonably good degree of confidence that Peel Common wastewater treatment works would have the capacity to treat effluent to the standards required by its current discharge consent, if Southern Water is eventually selected as the preferred wastewater treatment provider for Welborne. It is not currently known whether Knowle treatment works could be sufficiently upgraded to continue operating within its discharge consent limits if it was selected as the preferred option. The preferred solution for waste water treatment is not yet known, and so cannot be fully assessed at the current time. The issue will be taken forward for further analysis at the planning application stage.

Objective 1: Extent and distribution of the habitats of the qualifying features

6.9.5 The Solent and Southampton Water SPA/Ramsar is designated due to the presence of the following bird species listed under Annex I of the Birds Directive: Little Tern, Sandwich Tern, Common Tern, Mediterranean Gull, Roseate Tern. The Ramsar citation further lists an internationally important breeding population of Black-headed Gull. The site also supports an important population of overwintering Black-tailed Godwit, Dark-bellied Brent Goose, Ringed Plover and Teal and is recognised as supporting an internationally important assemblage of birds. Post-development traffic flows on roads close to the SPA/Ramsar are predicted to either decrease, or increase by a level which is not significant. It is concluded that there will be no adverse effect on the extent and distribution of the habitats of qualifying species.

6.9.6 As a result of the SANGs planned for Welborne, together with contributions towards delivering the SDMP, it is concluded that there will be no adverse effects on the extent and distribution of the habitats of the qualifying species as a result of disturbance.

6.9.7 The allocation of land within Welborne is not considered to adversely affect the extent and distribution of supporting habitats for qualifying species outside of the SPA/Ramsar boundaries.

6.9.8 There is reasonable confidence that Peel Common wastewater treatment works has sufficient capacity to treat the volume of effluent that would be received from Welborne to the standards required by the current discharge consent, and as a result there would be no predicted adverse effects on the extent and distribution of the habitats of qualifying species. However, it is not currently known which option will be preferred, nor whether Knowle treatment works can be sufficiently upgraded to ensure no adverse effects if taken forward. Adverse effects from elevated pollutant loads within wastewater discharges cannot therefore be ruled out with confidence at this stage. Further project-level HRA will be required at the outline planning application stage to demonstrate that, whichever option is ultimately preferred, there are no adverse effects on the extent and distribution of habitats of qualifying species.

Objective 2: Structure and function of the habitats of the qualifying features

6.9.9 Predicted increases in traffic flow are relatively minor on roads close to the SPA. As a result there are no predicted adverse effects to the structure and function of the habitats of the qualifying species as a result of pollution impacts.

6.9.10 As a result of the SANGs planned for Welborne, together with contributions towards delivering the SDMP, it is concluded that there will be no adverse effects on the structure and function of the habitats of the qualifying species as a result of disturbance.

6.9.11 The allocation of land within Welborne is not considered to adversely affect the structure and function of supporting habitats for qualifying species outside of the SPA/Ramsar boundaries.

6.9.12 However until further project-level HRA is undertaken regarding the proposed wastewater treatment options, it cannot currently be concluded that the development of Welborne will not adversely affect the structure and function of the habitats of qualifying species, as a result of wastewater treatment and discharge.

Objective 3: Supporting processes on which the habitats of the qualifying features rely

6.9.13 Predicted increases in traffic flow are relatively minor on roads close to the SPA. As a result there are no predicted adverse effects to the supporting processes on which the habitats of the qualifying species rely due to pollution impacts.

6.9.14 The commitment towards delivering SANG and contributions to the SDMP is considered to demonstrate that sufficient measures are available to ensure that there will be no adverse effect on the supporting processes on which the habitats of qualifying species rely as a result of increased disturbance impacts.

6.9.15 The allocation of land within Welborne is not considered to adversely affect the supporting processes on which the habitats for qualifying species outside of the SPA/Ramsar boundaries rely.

6.9.16 It cannot currently be concluded that the development of Welborne will not adversely affect the supporting processes on which the habitats of qualifying species rely, as a result of wastewater treatment and discharge.

Objective 4: Populations of the qualifying features

6.9.17 Predicted increases in traffic flow are relatively minor on roads close to the SPA. It is not considered that there will be an adverse effect on the populations of the qualifying species of the Solent and Southampton Water SPA/Ramsar.

6.9.18 The commitment towards delivering SANG and contributions to the SDMP is considered to demonstrate that sufficient measures are available to ensure that there will be no adverse effect on the populations of qualifying species as a result of increased disturbance impacts.

6.9.19 The allocation of land within Welborne is not considered to adversely affect the populations of qualifying species outside of the SPA/Ramsar boundaries.

6.9.20 It cannot currently be concluded that the development of Welborne will not adversely affect the populations of qualifying species for which the SPA/Ramsar was designated, as a result of wastewater treatment and discharge.

Objective 5: Distribution of qualifying features within the site

6.9.21 Predicted increases in traffic flow are relatively minor on roads close to the SPA. It is not considered that there will be an adverse effect on the distributions of the qualifying species of the Solent and Southampton Water SPA/Ramsar.

6.9.22 The commitment towards delivering SANG and contributions to the SDMP is considered to demonstrate that sufficient measures are available to ensure that there will be no adverse effect on the distributions of qualifying species within the site as a result of increased disturbance impacts.

6.9.23 It cannot currently be concluded that the development of Welborne will not adversely affect the distributions of qualifying species within the SPA/Ramsar, as a result of wastewater treatment and discharge.

Conclusions regarding adverse effects on integrity

6.9.24 With regards air pollution and disturbance impacts, and effects on supporting habitats, it can be concluded that the Welborne Plan will not result in adverse effects on the ecological integrity of the Solent and Southampton Water SPA/Ramsar.

6.9.25 However, there is currently uncertainty regarding the potential for wastewater treatment and discharge impacts on the Solent and Southampton Water SPA/Ramsar, and it cannot currently be concluded that the development of Welborne will not adversely affect the ecological integrity of the site.

7 Summary and Conclusions

7.1 Summary

7.1.1 This document sets out the Habitats Regulations Assessment for the Publication Draft Welborne Plan. It draws on information previously published in other documents which form part of the overall HRA procedure for the Welborne Plan, including the 2012 Baseline Data Review Report and the 2013 Screening Statement.

7.1.2 The assessment addresses the following proposed policies within the Welborne Plan:

- WEL3 Allocation of land;
- WEL9 Employment;
- WEL10 The District Centre;
- WEL23 Transport Principles;
- WEL24 Strategic Road Access;
- WEL25 Local Road Transport and Access; and
- WEL37 Water Efficiency, Supply and Disposal.

7.2 Conclusions

7.2.1 It can be concluded that the Welborne Plan will not result in adverse effects on the ecological integrity of the Butser Hill SAC.

7.2.2 It can be concluded that the Welborne Plan will not result in adverse effects on the ecological integrity of the New Forest SAC/Ramsar. It can also be concluded that the Welborne Plan will not result in adverse effects on the ecological integrity of the New Forest SPA.

7.2.3 It can be concluded that the Welborne Plan will not result in adverse effects on the ecological integrity of the River Itchen SAC.

7.2.4 With regards air pollution impacts, it can be concluded that the Welborne Plan will not result in adverse effects on the ecological integrity of the Solent Maritime SAC. However, there is currently uncertainty regarding the potential for wastewater treatment and discharge impacts on the Solent Maritime SAC, and it cannot currently be concluded that the development of Welborne will not adversely affect the ecological integrity of the site in this way.

7.2.5 It can be concluded that the Welborne Plan will not result in adverse effects on the ecological integrity of the Chichester and Langstone Harbours SPA/Ramsar.

7.2.6 It can be concluded that the Welborne Plan will not result in adverse effects on the ecological integrity of the Portsmouth Harbour SPA/Ramsar.

7.2.7 With regards air pollution and disturbance impacts, and effects on supporting habitats, it can be concluded that the Welborne Plan will not result in adverse effects on the ecological integrity of the Solent and Southampton Water SPA/Ramsar. However, there is currently uncertainty regarding the potential for wastewater treatment and discharge impacts on the Solent and Southampton Water SPA/Ramsar, and it cannot currently be concluded that the development of Welborne will not adversely affect the ecological integrity of the site in this way.

7.3 Recommendations

7.3.1 Based on current traffic modelling results from the Sub-Regional Transport Model, there is predicted to be a significant increase in vehicle movements at the M27 Hamble crossing only. However, habitats present at this location are not sensitive to air pollution. Modelling results for the A27 near to Paulsgrove Lake indicate that future traffic flow could increase by 924 AADT vehicle movements, which is approaching a significant figure. The future project-level HRA for outline planning applications for development at Welborne will need to take this into account and demonstrate that the final proposed junction arrangements for the new community would not lead to a significant increase in traffic flow on any road link passing within 200m of SAC/SPA/Ramsar sites in and around the borough.

7.3.2 It is recommended that ecological surveys are undertaken within Dash Wood to establish its capacity to accept significantly increased visitors numbers as a result of its planned allocation as SANG. If any of the area which is currently assumed to be able to contribute towards meeting the SANG requirement is in any way reduced following the surveys, then an equivalent area of SANG will need to be provided elsewhere. Existing surveys have indicated that Knowle Triangle and Fareham Common are of little intrinsic ecological value, apart from the SINC on Fareham Common. Therefore, when they are laid out as SANG they should both be able to fully contribute to providing an alternative natural greenspace for visitors. Visitor surveys should be carried out at all three sites (Dash Wood, Knowle Triangle and Fareham Common) to inform an assessment of how they are currently used and guide planned improvements to SANG standard.

7.3.3 It is further recommended that a continuing dialogue is established with the New Forest National Park regarding the ongoing studies it is undertaking to inform the Recreation Management Strategy. This should seek to establish whether, and at what point, any financial contribution towards implementing the RMS would be required, over and above the Welborne Plan's proposals for SANG and contributions to the SDMP avoidance and mitigation strategy.

7.3.4 It is recommended that overwintering bird surveys within and adjacent to the Welborne policy boundary are continued to confirm that the level of use of the site by SPA/Ramsar species is not significant and/or is limited to areas such as the permanent pasture at Pook Lane (i.e. outside of the built footprint of the development). Surveys should build on the single season survey already undertaken, and continue for a total duration of at least three seasons.

7.3.5 It is recommended that feasibility studies are undertaken to establish which WWTW option is preferred, or whether a combination of the two approaches could be utilised. Studies should include within their objectives the need to confirm that the preferred option would be capable of meeting the required environmental standards for discharge, as stipulated by proposed policy WEL37.

7.4 Next Steps

7.4.1 Following publication of the Welborne Plan and its Habitats Regulations Assessment, the Plan will move towards Examination in Public. Representations received on the Publication Draft Plan may necessitate further changes to the plan and, if so, significant changes will also be subject to further appraisal. This may lead to a further edition of the HRA Report being produced, or perhaps an Addendum to the current report, so that the findings of further appraisal can be circulated. The representations, proposed changes to the plan and HRA information will be submitted to the Planning Inspector to consider during the Examination in Public.

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References and Bibliography

AEA Technology (2010): *Road transport emissions impacts on Nature Conservation Sites. Report to the Partnership for Urban South Hampshire*.

AECOM (January 2014): *Welborne New Community Infrastructure Delivery Plan 2014: Stage 2 Update Report*.

Boorman LA & Hazelden J (2012): Impacts of Additional Aerial Inputs of Nitrogen to Saltmarsh and Transitional Habitats. Report to Countryside Council for Wales, cited on http://www.apis.ac.uk/

British Trust for Ornithology (2004): *National Nightjar Survey*. [Accessed October 2013] www.bto.org/survey/complete/nat_nightjar2004/nightjar

British Trust for Ornithology website [accessed October 2013]: http://www.bto.org/about-birds

Chris Blandford Associates (2011): *The North of Fareham Consortium: North of Fareham Strategic Development Area Winter Birds Survey*.

Department for Communities and Local Government (DCLG, 2006): *Planning for the Protection of European Sites: Appropriate Assessment (Draft)*.

DCLG (2012): *National Planning Policy Framework*.

Dodd AM, Cleary BE, Dawkins JS, Byron HJ, Palframan LJ & Williams GM (2007): *The Appropriate Assessment of Spatial Plans in England: a guide to why, when and how to do it*.

Dore CJ *et al* (2003): *UK Emissions of Air Pollutants 1970 – 2003.* UK National Atmospheric Emissions Inventory.

English Nature (1997a&b, 1999 and 2001): *Habitats Regulations Guidance Notes 1 – 4*.

English Nature (2004): *Internal Guidance to decisions on 'site integrity': A framework for provision of advice to competent authorities*.

European Commission (2000a): *Communication from the Commission on the Precautionary Principle*.

European Commission (2000b): *Managing Natura 2000 Sites: The provisions of Article 6 of the Habitats Directive 92/43/EEC*.

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

European Council (1992): *Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora*.

European Council (2009): *Council Directive 2009/147/EC on the conservation of wild birds*.

Fearnley, H., Clarke, R. T. & Liley, D. (2010). *The Solent Disturbance & Mitigation Project. Phase II - On-site visitor survey results from the Solent region.* ©Solent Forum / Footprint Ecology.

Fearnley H, Clarke RT & Liley D (2011): *The Solent Disturbance and Mitigation Project. Phase II – results of the Solent household survey*. Solent Forum / Footprint Ecology.

Hampshire Biodiversity Partnership (2000): *Biodiversity Action Plan for Hampshire: Volume Two*. [Accessed October 2013]: www.hampshirebiodiversity.org.uk

Hall, R.J.; Emmett, B.; Garbutt, A.; Jones, L.; Rowe, E.; Sheppard, L.; Vanguelova, E.; Pitman, R.; Britton, A.; Hester, A.; Ashmore, M.; Power, S.; Caporn, S. (2011): *UK Status Report July 2011: Update to empirical critical loads of nitrogen*. Report to Defra under contract AQ801 Critical Loads and Dynamic Modelling, cited on http://www.apis.ac.uk/node/972

Holt C, Austin G, Calbrade N, Mellan H, Hearn R, Stroud D, Wotton S & Musgrove A (2012): *Waterbirds in the UK 2010/11: The Wetland Bird Survey*.

International Council for the Exploration of the Sea (ICES) (2013): *Report of the Working Group on North Atlantic Salmon (WGNAS*). Copenhagen, Denmark

International Union for Conservation of Nature website [accessed October 2013]: www.iucnredlist.org

Joint Nature Conservancy Council website [accessed October 2013]: http://jncc.defra.gov.uk/ProtectedSites/SACselection/SAC_habitats.asp

Jones, M.L.M.; Sowerby, A.; Williams, D.L.; Jones, R.E. (2008); Factors controlling soil development in sand dunes: evidence from a coastal dune soil chronosequence. *Plant and Soil* **307** 219-234, cited on http://www.apis.ac.uk/node/972

King D (2010): *Solent Waders and Brent Goose Strategy 2010*. Hampshire and Isle of Wight Wildlife Trust.

Langston RHW, Liley D, Murison G, Woodfield E & Clarke RT (2007): What effects do walkers and dogs have on the distribution and productivity of breeding European nightjar *Caprimulgus europaeus*? *Ibis* **149** (Suppl. 1): 27 – 36.

Laxen D and Wilson P (2002): *A New Approach to Deriving NO_2 from NO_X for Air Quality Assessment of Roads*. Report prepared on behalf of Defra and the devolved administrations.

Liley D & Clarke RT (2003): The impact of urban development and human disturbance on the numbers of nightjar *Caprimulgus europaeus* on heathlands in Dorset, England. *Biological Conservation* **114**: 219 – 230.

Liley D and Sutherland WJ (2007): Predicting the population consequences of human disturbance for Ringed Plovers *Charadrius hiaticula*: a game theory approach. *Ibis*, **149**, pp.82-94.

Liley D, Stillman R & Fearnley H (2011): *The Solent Disturbance and Mitigation Project, Phase 2: Results of Bird Disturbance Fieldwork 2009/10*. Footprint Ecology / Solent Forum.

Liley D & Tyldesley D (2013): *Solent Disturbance and Mitigation Project: Phase III. Towards an Avoidance and Mitigation Strategy*. Unpublished report. Footprint Ecology/David Tyldesley & Associates

Mallord, J.W., Dolman, P.M., Brown, A.F. & Sutherland, W.J. (2007a): Linking recreational disturbance to population size in a ground-nesting passerine. *Journal of Applied Ecology* **44**: 185–195.

Mallord JW, Dolman PM, Brown AF and Sutherland WJ (2007b): Quantifying density dependence in a bird population using human disturbance. *Oecologia*, **153**, pp.49-56.

Murison G (2002): *The Impact of Human Disturbance on the Breeding Success of Nightjar* Caprimulgus europaeus *on Heathlands in South Dorset, England.* English Nature Research Reports No. 483.

Murison G, Bullock JM, Underhill-Day J, Langston R, Brown AF & Sutherland WJ (2007): Habitat type determines the effects of disturbance on the breeding productivity of the Dartford Warbler *Sylvia undata*. *Ibis* **149** (Suppl. 1): 16 – 26.

MVA Consultancy (December 2013): *Welborne, Fareham – Run 8b SRTM Modelling Analysis*. Report for Fareham Borough Council.

New Forest National Park Authority (2010): *New Forest National Park Recreation Management Strategy 2010 – 2030.*

Nilsson J and Grennfelt P (Eds) (1988): *Critical Loads for Sulphur and Nitrogen*. Quoted by the Air Pollution Information System, accessed online at (14/09/09): http://www.apis.ac.uk/overview/issues/overview_Cloadslevels.htm

ODPM (2005): *Government Circular: Biodiversity and Geological Conservation – Statutory Obligations and their Impact within the Planning System*.

Phoenix, G.K.; Emmett, B.A.; Britton, A.J.; Caporn, S.J.M.; Dise, N.B.; Helliwell, R.; Jones, M.L.M.; Leake, J.R.; Leith, I.D.; Sheppard, L.J.; Sowerby, A.; Pilkington, M.G.; Rowe, E.C.; MR, A.; Power, S.A. (2012): Impacts of atmospheric nitrogen deposition: responses of multiple plant and soil parameters across contrasting ecosystems in long-term field experiments. *Global Change Biology* **18** 1197-1215, cited on http://www.apis.ac.uk/node/972

Plassmann, K.; Edwards-Jones, G.; Jones, M.L.M. (2009): The effects of low levels of nitrogen deposition and grazing on dune grassland. *Science of the Total Environment* **407** 1391-1404, cited on http://www.apis.ac.uk/node/972

Portsmouth Water (November 2013): *Draft Final Water Resource Management Plan 2014.*

Rowe, E.C.; Jones, M.L.M.; Henrys, P.A.; Smart, S.M.; Tipping, E.; Mills, R.T.E.; Evans, C.D. (2011): Predicting effects of N pollutant load on plant species based on a dynamic soil eutrophication indicator. Science Report 39, cited on http://www.apis.ac.uk/node/972

Sharp J, Lowen J & Liley D (2008): *Changing Patterns of Visitor Numbers within the New Forest National Park, with particular reference to the New Forest SPA.*

Stillman RA, Cox J, Liley D, Ravenscroft N, Sharp J & Wells M (2009): *Solent Disturbance and Mitigation Project: Phase I Report.* (Report to the Solent Forum).

Stillman RA, West AD, Clarke RT & Liley D (2012): *Solent Disturbance and Mitigation Project Phase II: Predicting the impact of human disturbance on overwintering birds in the Solent*. Report to the Solent Forum.

Tyldesley D (2009): *The Habitats Regulations Assessment of Local Development Documents: Revised Draft Guidance for Natural England.*

Urban Edge Environmental Consulting Ltd (UEEC; 2012): *Habitats Regulations Assessment for the North of Fareham SDA: Baseline Data Review Report.*

UEEC (2013): *Habitats Regulations Assessment for the New Community North of Fareham Plan: Screening Statement.*

United Nations Educational, Scientific and Cultural Organisation (UNESCO, 1971): *Convention on Wetlands of International Importance especially as Waterfowl Habitat*. (Ramsar (Iran), 2 February 1971, UN Treaty Series No. 14583).

Appendix I: Updated Screening Assessment

Please see insert.

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Publication Draft Welborne Plan: Updated Screening Assessment			SAC					SPA					Ramsar				
ID	Proposal	Likely Significant Effect / Comment	Butser Hill	River Itchen	Solent and Isle of Wight Lagoons	Solent Maritime	The New Forest	Chichester and Langstone Harbours	Portsmouth Harbour	Solent and Southampton Water	The New Forest	Chichester and Langstone Harbours	Portsmouth Harbour	Solent and Southampton Water	The New Forest
Development Principles																	
WEL1	Sustainable Development		A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1
WEL2	High Level Development Principles		A5	A5	A5	A5	A5	A5	A5	A5	A5	A5	A5	A5	A5
Allocation of Land and the Comprehensive Approach																	
WEL3	Allocation of Land	Atmospheric pollution; Disturbance; Effects on supporting habitats; Water abstraction; Wastewater discharge	?	D1/2	A4	D1/2	?	C2	C2	C2	C2	C2	C2	C2	?
WEL4	Comprehensive Approach		A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1
Maintaining Settlement Separation																	
WEL5	Maintaining Settlement Separation		A3	A3	A3	A3	A3	A3	A3	A3	A3	A3	A3	A3	A3
Character Areas, Design Principles and Heritage Assets																	
WEL6	General Design Principles		A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1
WEL7	Strategic Design Code		A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1
WEL8	Protection and Enhancement of the Historic Environment		A3	A3	A3	A3	A3	A3	A3	A3	A3	A3	A3	A3	A3
Economy and Self-Containment																	
WEL9	Employment	Atmospheric pollution	?	D1/2	A4	D1/2	?	D1/2	D1/2	D1/2	?	D1/2	D1/2	D1/2	?
WEL10	The District Centre	Atmospheric pollution	?	D1/2	A4	D1/2	?	D1/2	D1/2	D1/2	?	D1/2	D1/2	D1/2	?
WEL11	The Local Centre		A4	A4	A4	A4	A4	A4	A4	A4	A4	A4	A4	A4	A4
WEL12	Community Hub		A4	A4	A4	A4	A4	A4	A4	A4	A4	A4	A4	A4	A4
WEL13	Community Buildings		A4	A4	A4	A4	A4	A4	A4	A4	A4	A4	A4	A4	A4
WEL14	Healthcare Services		A4	A4	A4	A4	A4	A4	A4	A4	A4	A4	A4	A4	A4
WEL15	Primary and Pre-School Provision	(Capacity designed to meet Welborne need only; All are located west of A32)	A4	A4	A4	A4	A4	A4	A4	A4	A4	A4	A4	A4	A4
WEL16	Secondary School Provision	(Capacity designed to meet Welborne need only; Located west of A32)	A4	A4	A4	A4	A4	A4	A4	A4	A4	A4	A4	A4	A4

Publication Draft Welborne Plan: Updated Screening Assessment			SAC					SPA				Ramsar			
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Homes															
WEL17	Market Housing Mix and Flexibility		A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1
WEL18	Affordable Housing		A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1
WEL19	Extra Care Provision		A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1
WEL20	Wheelchair Adapted Homes		A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1
WEL21	Custom Build Homes		A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1
WEL22	Gypsies, Travellers and Travelling Showpeople		A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1
Transport, Access and Movement															
WEL23	Transport Principles for Welborne	Atmospheric pollution	?	D1/2	A4	D1/2	?	D1/2	D1/2	D1/2	?	D1/2	D1/2	D1/2	?
WEL24	Strategic Road Access	Atmospheric pollution	?	D1/2	A4	D1/2	?	D1/2	D1/2	D1/2	?	D1/2	D1/2	D1/2	?
WEL25	Local Road Transport and Access	Atmospheric pollution	?	D1/2	A4	D1/2	?	D1/2	D1/2	D1/2	?	D1/2	D1/2	D1/2	?
WEL26	Public Transport		A4	A4	A4	A4	A4	A4	A4	A4	A4	A4	A4	A4	A4
WEL27	Encouraging Sustainable Choices		A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1
WEL28	Cycling and Pedestrian Linkages		A4	A4	A4	A4	A4	A4	A4	A4	A4	A4	A4	A4	A4
Green Infrastructure, Biodiversity and Landscape															
WEL29	On-site Green Infrastructure		A3	A3	A3	A3	A3	A3	A3	A3	A3	A3	A3	A3	A3
WEL30	Avoiding and Mitigating the Impact on Internationally Protected Sites and Off-Site Green Infrastructure		A2	A2	A2	A2	A2	A2	A2	A2	A2	A2	A2	A2	A2
WEL31	Conserving and Enhancing Biodiversity		A2	A2	A2	A2	A2	A2	A2	A2	A2	A2	A2	A2	A2
WEL32	Strategic Green Infrastructure Corridors and Connections		A3	A3	A3	A3	A3	A3	A3	A3	A3	A3	A3	A3	A3
WEL33	Structural Landscaping		A3	A3	A3	A3	A3	A3	A3	A3	A3	A3	A3	A3	A3
WEL34	Detailed Landscaping		A3	A3	A3	A3	A3	A3	A3	A3	A3	A3	A3	A3	A3
WEL35	Governance and Maintenance of Green Infrastructure		A3	A3	A3	A3	A3	A3	A3	A3	A3	A3	A3	A3	A3

Publication Draft Welborne Plan: Updated Screening Assessment			SAC					SPA				Ramsar			
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Energy, Water and Waste															
WEL36	Energy		A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1
WEL37	Water Efficiency, Supply and Disposal	Water abstraction; Wastewater discharge	A1	?	A1	?	A1	A1	?	?	A1	A1	?	?	A1
WEL38	Water Quality and Aquifer Protection		A3	A3	A3	A3	A3	A3	A3	A3	A3	A3	A3	A3	A3
WEL39	Flooding and Sustainable Drainage Systems		A3	A3	A3	A3	A3	A3	A3	A3	A3	A3	A3	A3	A3
WEL40	Household Waste Recycling Centre and Recycling		A4	A4	A4	A4	A4	A4	A4	A4	A4	A4	A4	A4	A4
Delivering the New Community															
WEL41	Phasing and Delivery		A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1
WEL42	Safeguarding Land for Specific Development		A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1
WEL43	Development Construction and Quality Control		A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1

Assessment Key

Category A: No negative effect	
A1	Options / policies that will not themselves lead to development e.g. because they relate to design or other qualitative criteria for development, or they are not a land use planning policy.
A2	Options / policies intended to protect the natural environment, including biodiversity.
A3	Options / policies intended to conserve or enhance the natural, built or historic environment, where enhancement measures will not be likely to have any negative effect on a European Site.
A4	Options / policies that positively steer development away from European sites and associated sensitive areas.
A5	Options / policies that would have no effect because development is implemented through later policies in the same plan, which are more specific and therefore more appropriate to assess for their effects on European Sites.
Category B: No significant effect	
B	Options / policies that could have an effect, but the likelihood is there would be no significant negative effect on a European site either alone or in combination with other elements of the same plan, or other plans or projects.
Category C: Likely significant effect alone	
C1	The option, policy or proposal could directly affect a European site because it provides for, or steers, a quantity or type of development onto a European site, or adjacent to it.
C2	The option / policy could indirectly affect a European site e.g. because it provides for, or steers, a quantity or type of development that may be ecologically, hydrologically or physically connected to it or increase disturbance.
C3	Proposals for a magnitude of development that, no matter where it was located, the development would be likely to have a significant effect on a European site.
C4	An option / policy that makes provision for a quantity / type of development but the effects are uncertain because its detailed location is to be selected following consideration of options in a later, more specific plan.
C5	Options / policies for developments or infrastructure projects that could block alternatives for the provision of other development in the future, that may lead to adverse effects on European sites, which would otherwise be avoided.
C6	Options, policies or proposals which are to be implemented in due course - if implemented in one or more particular ways, the proposal could possibly have a significant effect on a European site.
C7	Any other options, policies or proposals that would be vulnerable to failure under the Habitats Regulations at project assessment stage; to include them in the plan would be regarded by the EC as 'faulty planning'.
C8	Any other proposal that may have an adverse effect on a European site, which might try to pass the tests of HRA at project level by arguing that the plan provides IROPI to justify its consent despite a negative assessment.
Category D: Likely significant effects in combination	
D1	The option, policy or proposal alone would not be likely to have significant effects but if its effects are combined with the effects of other policies within the same plan the cumulative effects would be likely to be significant.
D2	Options, policies or proposals that alone would not be likely to have significant effects but if their effects are combined with the effects of other plans or projects, the combined effects would be likely to be significant.
D3	Options or proposals that are, or could be, part of a programme or sequence of development delivered over a period, where the implementation of the later stages could have a significant effect on European sites.
?	Uncertain effects - take forward to Appropriate Assessment.

			SAC					SPA				Ramsar			
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ID	Proposal	Likely Significant Effect / Comment													

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Appendix II: Site Condition Status

European Site	SSSI Name	Condition Status
Butser Hill SAC	Butser Hill	10 units consisting of; 92.13% Favourable and 7.87% Unfavourable recovering.
River Itchen SAC	River Itchen	116 units consisting of 6.55% Favourable, 57.02% Unfavourable recovering, 30.34% unfavourable no change, 5.72% Unfavourable declining, 0.37% Destroyed / part destroyed
Solent Maritime SAC	Chichester Harbour	43 units consisting of 22.09% favourable, 77.67% unfavourable recovering and 0.24% unfavourable no change
	Bracklesham Bay	4 units; 64.95% consisting of 29.54% unfavourable recovering and 5.51% unfavourable no change
	Yar Estuary	30 units consisting of 83.15% favourable and 16.85% unfavourable recovering.
	Hurst Castle and Lymington River Estuary	34 units; 27.04% of the area is favourable, 70.09% unfavourable recovering and 2.87% unfavourable declining
	New Forest	582 units; 52.66% of the area is favourable, 46.15% unfavourable recovering, 0.30% unfavourable no change, 0.88% unfavourable declining and 0.01% destroyed/part destroyed
	King's Quay Shore	30 units; 95.12% of the area is favourable, 4.67% unfavourable recovering and 0.21% destroyed/part destroyed
	Upper Hamble Estuary and Woods	16 units; 85.94% of the area is favourable, 11.31% is unfavourable recovering and 2.75% unfavourable no change
	Eling and Bury Marshes	4 units; 11.46% of the area is favourable and 88.54% is unfavourable recovering
	Lincegrove and Hackett's Marshes	3 units; 100% of the area is unfavourable recovering
	Lower Test Valley	8 units all in favourable condition

European Site	SSSI Name	Condition Status
	Bouldnor And Hamstead Cliffs	9 units all in favourable condition
	Hythe to Calshot Marshes	6 units; 100% of the area is unfavourable recovering
	Sinah Common	2 units; 100% of the area is unfavourable recovering
	Lee-on-the Solent to Itchen Estuary	27 units; 82.49% of the area is favourable, 15.98% unfavourable recovering and 1.53% unfavourable no change
	Newtown Harbour	78 units; 89.33% of the area is favourable, 10.32% is unfavourable recovering, 0.35% unfavourable declining
	Langstone Harbour	13 units; 8.96% of which favourable, 91.04% unfavourable recovering
	Medina Estuary	12 units; all in favourable condition
	Thorness Bay	14 units; 96.21% of the area is favourable and 3.79% is unfavourable declining
	Warblington Meadow	1 unit which is in unfavourable recovering condition
	North Solent	98 units; 63.21% of the area is favourable, 34.94% unfavourable recovering, 0.93% unfavourable no change, 0.91% unfavourable declining
New Forest SAC	Landford Heath	3 units; 51.97% of the area is unfavourable recovering and 48.03% is unfavourable declining
	River Avon System	51 units; 3.48% of the area is favourable, 36.59% is unfavourable recovering, 57.13% is unfavourable no change, 2.8% is unfavourable declining
	Landford Bog	2 units both unfavourable recovering
	Langley Wood and Homan's Copse	3 units; 98.87% is unfavourable no change, 1.13% is unfavourable declining
	Whiteparish Common	4 units; 1.27% of the area is favourable, 91.84% is unfavourable recovering, 6.90% is unfavourable no change
	Loosehanger Copse and Meadows	5 units; all in unfavourable but recovering condition
	The New Forest	582 units; 52.66% of the area is favourable, 46.15% unfavourable recovering, 0.30% unfavourable no change,

European Site	SSSI Name	Condition Status
		0.88% unfavourable declining and 0.01% destroyed/part destroyed
	Norley Copse and Meadow	2 units; 58.63% of the area is favourable, 41.37% is unfavourable recovering
	Roydon Woods	8 units all in favourable condition
	Lymington River	1 unit in unfavourable but recovering condition
	North Solent	98 units; 63.21% of the area is favourable, 34.94% unfavourable recovering, 0.93% unfavourable no change, 0.91% unfavourable declining
Chichester and Langstone Harbours SPA	Chichester Harbour	43 units consisting of 22.09% favourable, 77.67% unfavourable recovering and 0.24% unfavourable no change
	Sinah Common	2 units; 100% of the area is unfavourable recovering
	Langstone Harbour	13 units; 8.96% of which favourable, 91.04% unfavourable recovering
	Warblington Meadow	1 unit which is in unfavourable recovering condition
Portsmouth Harbour SPA	Portsmouth Harbour	23 units; 23.44% of the area is favourable, 76.19% is unfavourable recovering, 0.02% is unfavourable declining and 0.35% destroyed / part destroyed
Solent and Southampton Water SPA	Yar Estuary	30 units consisting of 83.15% favourable and 16.85% unfavourable recovering.
	Hurst Castle and Lymington River Estuary	34 units; 27.04% of the area is favourable, 70.09% unfavourable recovering and 2.87% unfavourable declining
	Bembridge School and Cliffs	6 units; 92.45% of the area is favourable, 7.55% is unfavourable no change
	New Forest	582 units; 52.66% of the area is favourable, 46.15% unfavourable recovering, 0.30% unfavourable no change, 0.88% unfavourable declining and 0.01% destroyed/part destroyed
	King's Quay Shore	30 units; 95.12% of the area is favourable, 4.67% unfavourable recovering and 0.21% destroyed/part destroyed
	Sowley Pond	2 units both in favourable condition
	Upper Hamble Estuary and Woods	16 units; 85.94% of the area is favourable, 11.31% is unfavourable recovering and 2.75% unfavourable no change

European Site	SSSI Name	Condition Status
	Whitecliff Bay and Bembridge Ledges	8 units; 99.07% of the area is favourable, 0.93% is unfavourable no change
	Eling and Bury Marshes	4 units; 11.46% of the area is favourable and 88.54% is unfavourable recovering
	Lincegrove and Hackett's Marshes	3 units; 100% of the area is unfavourable recovering
	Brading Marshes to St Helens Ledges	58 units; 40.03% of the area is favourable, 11.83% is unfavourable recovering, 48.59% is unfavourable declining
	Lower Test Valley	8 units all in favourable condition
	Lymington River Reedbeds	4 units; 35.50% of the area is favourable, 64.50% is unfavourable recovering
	Dibden Bay	2 units; 98% of the area is favourable, 2% is unfavourable and declining
	Hythe to Calshott Marshes	6 units; 100% of the area is unfavourable recovering
	River Test	91 units; 17.92% of the area is favourable, 37.55% unfavourable recovering, 43.39%unfavourable no change, 1.03% unfavourable declining
	Lee-on-the Solent to Itchen Estuary	27 units; 82.49% of the area is favourable, 15.98% unfavourable recovering and 1.53% unfavourable no change
	Titchfield Haven	8 units; 96.48% unfavourable recovering and 3.52% unfavourable declining
	Newtown Harbour	78 units; 89.33% of the area is favourable, 10.32% is unfavourable recovering, 0.35% unfavourable declining
	Medina Estuary	12 units; all in favourable condition
	Thorness Bay	14 units; 96.21% of the area is favourable and 3.79% is unfavourable declining
	Lymington River	1 unit in unfavourable but recovering condition
	Ryde Sands and Wootton Creek	17 units; 71.92% of the area is favourable and 28.08% is unfavourable but recovering
	North Solent	98 units; 63.21% of the area is favourable, 34.94% unfavourable recovering, 0.93% unfavourable no change,

European Site	SSSI Name	Condition Status
		0.91% unfavourable declining
New Forest SPA	Landford Heath	3 units; 51.97% of the area is unfavourable recovering and 48.03% is unfavourable declining
	River Avon System	51 units; 3.48% of the area is favourable, 36.59% is unfavourable recovering, 57.13% is unfavourable no change, 2.8% is unfavourable declining
	New Forest	582 units; 52.66% of the area is favourable, 46.15% unfavourable recovering, 0.30% unfavourable no change, 0.88% unfavourable declining and 0.01% destroyed/part destroyed
	Norley Copse and Meadow	2 units; 58.63% of the area is favourable, 41.37% is unfavourable recovering
	Lymington River	1 unit in unfavourable but recovering condition
	North Solent	98 units; 63.21% of the area is favourable, 34.94% unfavourable recovering, 0.93% unfavourable no change, 0.91% unfavourable declining
	Roydon Woods	8 units all in favourable condition
Chichester and Langstone Harbours Ramsar	Chichester Harbour	43 units consisting of 22.09% favourable, 77.67% unfavourable recovering and 0.24% unfavourable no change
	Sinah Common	2 units; 100% of the area is unfavourable recovering
	Langstone Harbour	13 units; 8.96% of which favourable, 91.04% unfavourable recovering
Portsmouth Harbour Ramsar	Portsmouth Harbour	23 units; 23.44% of the area is favourable, 76.19% is unfavourable recovering, 0.02% is unfavourable declining and 0.35% destroyed / part destroyed
New Forest Ramsar	River Avon System	51 units; 3.48% of the area is favourable, 36.59% is unfavourable recovering, 57.13% is unfavourable no change, 2.8% is unfavourable declining
	New Forest	582 units; 52.66% of the area is favourable, 46.15% unfavourable recovering, 0.30% unfavourable no change, 0.88% unfavourable declining and 0.01% destroyed/part destroyed
	Norley Copse and Meadow	2 units; 58.63% of the area is favourable, 41.37% is unfavourable recovering

European Site	SSSI Name	Condition Status
	Lymington River	1 unit in unfavourable but recovering condition
	North Solent	98 units; 63.21% of the area is favourable, 34.94% unfavourable recovering, 0.93% unfavourable no change, 0.91% unfavourable declining
	Roydon Woods	8 units all in favourable condition
Solent and Southampton Water Ramsar	Yar Estuary	30 units consisting of 83.15% favourable and 16.85% unfavourable recovering.
	Hurst Castle and Lymington River Estuary	34 units; 27.04% of the area is favourable, 70.09% unfavourable recovering and 2.87% unfavourable declining
	Bembridge School and Cliffs	6 units; 92.45% of the area is favourable, 7.55% is unfavourable no change
	New Forest	582 units; 52.66% of the area is favourable, 46.15% unfavourable recovering, 0.30% unfavourable no change, 0.88% unfavourable declining and 0.01% destroyed/part destroyed
	King's Quay Shore	30 units; 95.12% of the area is favourable, 4.67% unfavourable recovering and 0.21% destroyed/part destroyed
	Sowley Pond	2 units both in favourable condition
	Upper Hamble Estuary and Woods	16 units; 85.94% of the area is favourable, 11.31% is unfavourable recovering and 2.75% unfavourable no change
	Whitecliff Bay and Bembridge Ledges	8 units; 99.07% of the area is favourable, 0.93% is unfavourable no change
	Eling and Bury Marshes	4 units; 11.46% of the area is favourable and 88.54% is unfavourable recovering
	Lincegrove and Hackett's Marshes	3 units; 100% of the area is unfavourable recovering
	Brading Marshes to St Helens Ledges	58 units; 40.03% of the area is favourable, 11.83% is unfavourable recovering, 48.59% is unfavourable declining
	Lower Test Valley	8 units all in favourable condition

European Site	SSSI Name	Condition Status
	Lymington River Reedbeds	4 units; 35.50% of the area is favourable, 64.50% is unfavourable recovering
	Dibden Bay	2 units; 98% of the area is favourable, 2% is unfavourable and declining
	Hythe to Calshott Marshes	6 units; 100% of the area is unfavourable recovering
	River Test	91 units; 17.92% of the area is favourable, 37.55% unfavourable recovering, 43.39%unfavourable no change, 1.03% unfavourable declining
	Lee-on-the Solent to Itchen Estuary	27 units; 82.49% of the area is favourable, 15.98% unfavourable recovering and 1.53% unfavourable no change
	Titchfield Haven	8 units; 96.48% unfavourable recovering and 3.52% unfavourable declining
	Newtown Harbour	78 units; 89.33% of the area is favourable, 10.32% is unfavourable recovering, 0.35% unfavourable declining
	Medina Estuary	12 units; all in favourable condition
	Thorness Bay	14 units; 96.21% of the area is favourable and 3.79% is unfavourable declining
	Lymington River	1 unit in unfavourable but recovering condition
	Ryde Sands and Wootton Creek	17 units; 71.92% of the area is favourable and 28.08% is unfavourable but recovering
	North Solent	98 units; 63.21% of the area is favourable, 34.94% unfavourable recovering, 0.93% unfavourable no change, 0.91% unfavourable declining

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Appendix III: APIS Grid Reference Data

The following tables show data held by APIS (at 17/10/12) for exceedances of critical loads/levels for atmospheric pollutant types relevant to the HRA, at a range of grid references on the strategic road network connecting to Welborne. All locations are both within a European site, and within 200m of a road corridor. Cells highlighted in red are already exceeded; those highlighted in yellow have a background load/level >70% of the critical load/level. The following abbreviations apply:

CL = Critical load or level for target habitat at this location

Dep. / conc. = Current rates of deposition or concentration

Exceed. = The amount by which CL is exceeded

EU site name: River Itchen SAC

Queried habitat(s): Broadleaved, Mixed and Yew Woodland

Grid ref(s): 445327,115588 **Map ref(s):** 1

Road corridor(s): A27, M27

	445327,115588		
Pollutant:	**CL**	**Dep. / conc.**	**Exceed.**
Acid dep. (keq/ha/yr)	CLmaxS: 4.24 CLminN: 0.28 CLmaxN: 4.53	2.48 (N: 2.16 | S: 0.32)	No
N dep. (kgN/ha/yr)	10 - 20	30.24	20.24
NOx (µgm^{-3})	30	30.1	0.1

EU site name: Solent Maritime SAC (Hamble)

Queried habitat(s): Coastal Saltmarsh

Grid ref(s): 449288,109754 and 449644,110080 **Map ref(s):** 2, 3

Road corridor(s): A27, M27

	449288,109754			449644,110080		
Pollutant:	**CL**	**Dep. / conc.**	**Exceed.**	**CL**	**Dep. / conc.**	**Exceed.**
Acid dep. (keq/ha/yr)	4.00	1.26 (N: 1 | S: 0.26)	-2.74	4.00	1.45 (N: 1.16 | S: 0.29)	-2.55
N dep. (kgN/ha/yr)	20 - 30	14	-6	20 - 30	16.24	-3.76
NOx (µgm^{-3})	30	27.4	-2.6	30	32.47	2.47

EU site name: Solent and Southampton Water SPA/Ramsar (Titchfield)

Queried habitat(s): Fen, Marsh and Swamp

Grid ref(s): 454802,104232 **Map ref(s):** 4

Road corridor(s): B3334 Titchfield Road

	454802,104232		
Pollutant:	**CL**	**Dep. / conc.**	**Exceed.**
Acid dep. (keq/ha/yr)	This habitat is not sensitive to acidity	1.05	n/a
N dep. (kgN/ha/yr)	Rich fens: 15 - 30	11.34	Rich fens: -3.66
NOx (µgm^{-3})	30	22.26	-7.74

EU site name: Portsmouth Harbour SPA/Ramsar (Gosport centre)

Queried habitat(s): Coastal Saltmarsh

Grid ref(s): 461721,099688 **Map ref(s):** 5

Road corridor(s): B3333 South Street

	461721,099688		
Pollutant:	**CL**	**Dep. / conc.**	**Exceed.**
Acid dep. (keq/ha/yr)	4.00	1.04	-2.96
N dep. (kgN/ha/yr)	20-30	11.06	-8.94
NOx (µgm^{-3})	30	26.21	-3.79

EU site name: Portsmouth Harbour SPA/Ramsar (Fareham Town Quay)

Queried habitat(s): Coastal Saltmarsh

Grid ref(s): 457942,105820 **Map ref(s):** 6

Road corridor(s): A32 Gosport Road

	457942,105820		
Pollutant:	**CL**	**Dep. / conc.**	**Exceed.**
Acid dep. (keq/ha/yr)	4.00	1.34	-2.66
N dep. (kgN/ha/yr)	20-30	15.54	-4.46
NOx (µgm^{-3})	30	28.41	-1.59

EU site name: Portsmouth Harbour SPA/Ramsar (Wallington)

Queried habitat(s): Coastal Saltmarsh

Grid ref(s): 458702,106197 **Map ref(s):** 7

Road corridor(s): A27 Eastern Way / A27 Cams Hill

	458702,106197		
Pollutant:	**CL**	**Dep. / conc.**	**Exceed.**
Acid dep. (keq/ha/yr)	4.00	1.34	-2.66
N dep. (kgN/ha/yr)	20-30	15.54	-4.46
NOx (μgm^{-3})	30	28.41	-1.59

EU site name: Portsmouth Harbour SPA/Ramsar (Paulsgrove Lake)

Queried habitat(s): Coastal Saltmarsh

Grid ref(s): 462845,105624 **Map ref(s):** 8

Road corridor(s): A27 Southampton Road

	462845,105624		
Pollutant:	**CL**	**Dep. / conc.**	**Exceed.**
Acid dep. (keq/ha/yr)	4.00	1.61	-2.39
N dep. (kgN/ha/yr)	20-30	19.32	-0.68
NOx (μgm^{-3})	30	26.12	-3.88

EU site name: Portsmouth Harbour SPA/Ramsar (Tipner Lake)

Queried habitat(s): Coastal Saltmarsh

Grid ref(s): 464782,104441 **Map ref(s):** 9

Road corridor(s): M27/M275 interchange

	462845,105624		
Pollutant:	**CL**	**Dep. / conc.**	**Exceed.**
Acid dep. (keq/ha/yr)	4.00	1.13	-2.87
N dep. (kgN/ha/yr)	20-30	12.46	-7.54
NOx (μgm^{-3})	30	29.48	-0.52

EU site name: Chichester & Langstone Harbours SPA/Ramsar, Solent Maritime SAC (Farlington)

Queried habitat(s): Coastal Saltmarsh

Grid ref(s): 467488,104225 **Map ref(s):** 10

Road corridor(s): A2030 Eastern Road / A27

	467488,104225		
Pollutant:	**CL**	**Dep. / conc.**	**Exceed.**
Acid dep. (keq/ha/yr)	4.00	1.16	-2.84
N dep. (kgN/ha/yr)	20-30	13.02	-6.98
NOx (µgm^{-3})	30	34.75	4.75

EU site name: Chichester & Langstone Harbours SPA/Ramsar, Solent Maritime SAC (Broadmarsh)

Queried habitat(s): Coastal Saltmarsh

Grid ref(s): 469518,105424 **Map ref(s):** 11

Road corridor(s): A3(M) / A27

	469518,105424		
Pollutant:	**CL**	**Dep. / conc.**	**Exceed.**
Acid dep. (keq/ha/yr)	4.00	1.22	-2.78
N dep. (kgN/ha/yr)	20-30	13.72	-6.28
NOx (µgm^{-3})	30	28.2	-1.8

EU site name: New Forest SAC/SPA/Ramsar

Queried habitat(s): Dwarf Shrub Heath

Grid ref(s): 441896,105409 **Map ref(s):** 12

Road corridor(s): A326 Hythe By-pass

	441896,105409		
Pollutant:	**CL**	**Dep. / conc.**	**Exceed.**
Acid dep. (keq/ha/yr)	CLmaxS: 0.27 CLminN: 0.64 CLmaxN: 0.91	1.21 (N: 0.93 | S: 0.28)	Yes
N dep. (kgN/ha/yr)	10-20	13.02	3.02
NOx (µgm^{-3})	30	24.04	-5.96

EU site name: Butser Hill SAC

Queried habitat(s): Calcareous Grassland

Grid ref(s): 472125,119661 **Map ref(s):** 13

Road corridor(s): A3(T)

	472125,119661		
Pollutant:	**CL**	**Dep. / conc.**	**Exceed.**
Acid dep. (keq/ha/yr)	CLmaxS: 3.95 CLminN: 0.85 CLmaxN: 4.81	1.58 (N: 1.25 | S: 0.33)	No
N dep. (kgN/ha/yr)	Sub-Atlantic semi-dry calcareous grassland: 15 – 25	17.5	Sub-Atlantic semi-dry calcareous grassland: 2.5
NOx (μgm^{-3})	30	15.84	-14.16

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Appendix IV: SRTM Run 8b AADT Traffic Flows

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Area	Road	Direction	Road Number	Run 1 2036 - AM (Peak Hour Veh)	Run 8b 2036 - AM (Peak Hour Veh)	Diff (8b - 1)	Diff %	Run 1 2036 - IP (Average IP Veh)	Run 8b 2036 - IP (Average IP Veh)	Diff (8b - 1)	Diff %	Run 1 2036 - PM (Peak Hour Veh)	Run 8b 2036 - PM (Peak Hour Veh)	Diff (8b - 1)	Diff %	Run 1 2036 - AADT	Run 8b 2036 - AADT	Diff (8b - 1)	Diff %
Buster Hill SAC	A3 (M)	NB	3	3,554	3,542	-12	0%	2,394	2,377	-17	-1%	2,478	2,455	-23	-1%	29217	29022	-195	-0.7%
		SB		2,339	2,359	20	1%	2,412	2,405	-7	0%	3,510	3,506	-4	0%	29138	29116	-22	-0.1%
River Itchen SAC	M27	EB	12	5,957	5,923	-34	-1%	5,591	5,585	-6	0%	6,831	6,832	1	0%	65933	65831	-102	-0.2%
		WB		6,228	6,259	31	1%	5,449	5,445	-5	0%	5,987	5,978	-9	0%	63716	63721	6	0.0%
	M3	NB	10	6,017	6,022	5	0%	5,184	5,188	3	0%	5,299	5,305	5	0%	59999	60042	43	0.1%
		SB		5,528	5,520	-8	0%	5,452	5,447	-5	0%	5,907	5,888	-20	0%	62269	62180	-90	-0.1%
	A272	EB	11	151	151	0	0%	81	81	0	0%	190	195	5	3%	1259	1271	12	0.9%
		WB		290	294	4	1%	123	123	0	0%	124	123	0	0%	1696	1702	5	0.3%
	A34	NB	9	2,768	2,763	-5	0%	2,676	2,672	-5	0%	2,829	2,824	-6	0%	30528	30474	-54	-0.2%
		SB		3,125	3,125	0	0%	2,830	2,822	-8	0%	3,081	3,079	-2	0%	32829	32766	-63	-0.2%
Solent & Isle of Wight Lagoons SAC, Solent & Soton Water Ramsar	Fort Road, Gosport	SB	1	33	33	0	-1%	37	29	-8	-22%	64	63	-1	-2%	461	400	-62	-13.4%
		NB		51	51	0	0%	37	36	0	0%	34	34	0	0%	431	431	-1	-0.1%
The New Forest SAC, The New Forest SPA, The New Forest Ramsar	M27 J1 to J2	NB	5	4,712	4,706	-7	0%	3,681	3,683	1	0%	4,019	4,016	-3	0%	43938	43930	-8	0.0%
		SB		3,408	3,402	-5	0%	3,646	3,643	-3	0%	4,016	4,010	-7	0%	41231	41184	-47	-0.1%
		SB		3,408	3,402	-5	0%	3,646	3,643	-3	0%	4,016	4,010	-7	0%	41231	41184	-47	-0.1%
	A35	WB	4	754	755	0	0%	775	774	-1	0%	966	966	0	0%	9049	9040	-9	-0.1%
		EB		916	914	-2	0%	705	704	-1	0%	889	892	3	0%	8675	8672	-4	0.0%
		WB		754	755	0	0%	775	774	-1	0%	966	966	0	0%	9049	9040	-9	-0.1%
		EB		916	914	-2	0%	705	704	-1	0%	889	892	3	0%	8675	8672	-4	0.0%
		WB		769	770	0	0%	793	791	-1	0%	978	977	0	0%	9226	9217	-9	-0.1%
		EB		923	921	-2	0%	721	720	-1	0%	900	903	3	0%	8828	8824	-4	0.0%
		WB		859	860	1	0%	836	835	-1	0%	1,050	1,050	0	0%	9856	9850	-6	-0.1%
		EB		906	904	-2	0%	711	710	-1	0%	879	882	3	0%	8680	8676	-4	0.0%
		WB		259	259	0	0%	188	188	0	0%	339	338	0	0%	2543	2541	-2	-0.1%
		EB		256	256	0	0%	135	135	0	0%	198	197	-1	-1%	1866	1866	0	0.0%
		WB		1,281	1,282	2	0%	1,276	1,275	-1	0%	1,589	1,589	-1	0%	14963	14957	-7	0.0%
		EB		922	922	-1	0%	734	735	0	0%	952	948	-4	0%	9030	9023	-7	-0.1%
		WB		663	664	1	0%	640	640	0	0%	850	849	-1	0%	7648	7647	-1	0.0%
		EB		310	309	-1	0%	181	181	0	0%	280	281	1	0%	2467	2469	1	0.1%
		SB		666	668	1	0%	642	642	0	0%	857	856	-1	0%	7687	7684	-2	0.0%
		NB		310	309	-1	0%	181	181	0	0%	280	281	1	0%	2467	2469	1	0.1%
	A36	WB	7	786	782	-4	0%	826	823	-3	0%	1,013	1,012	-1	0%	9574	9542	-32	-0.3%
		EB		1,097	1,095	-2	0%	982	981	-1	0%	1,230	1,229	-1	0%	11736	11722	-14	-0.1%
		WB		792	789	-4	0%	835	832	-3	0%	1,020	1,019	-1	0%	9668	9636	-32	-0.3%
		EB		1,113	1,111	-2	0%	997	996	-1	0%	1,244	1,242	-1	0%	11906	11892	-14	-0.1%
		NB		807	804	-3	0%	703	700	-3	0%	744	745	1	0%	8170	8146	-24	-0.3%
		SB		831	831	0	0%	845	844	0	0%	1,156	1,155	0	0%	10081	10077	-4	0.0%
	A31	WB	6	1,979	1,979	-1	0%	1,750	1,748	-2	0%	2,190	2,188	-1	0%	20952	20936	-16	-0.1%
		EB		3,229	3,230	0	0%	2,365	2,366	2	0%	2,514	2,516	2	0%	28468	28485	17	0.1%
	Roger Penn Way	WB	8	795	795	0	0%	699	699	0	0%	746	746	0	0%	8123	8122	-2	0.0%
		EB		830	831	1	0%	518	518	0	0%	570	571	1	0%	6503	6507	4	0.1%
		WB		763	763	0	0%	666	666	0	0%	744	744	1	0%	7816	7814	-2	0.0%
		EB		797	798	1	0%	484	484	0	0%	531	532	0	0%	6113	6116	2	0.0%
		WB		90	90	0	0%	101	101	0	0%	88	88	0	0%	1084	1085	1	0.1%
		EB		8	8	0	0%	68	68	0	0%	8	8	0	0%	533	531	-2	-0.3%
	A3023	SB	18	718	714	-4	-1%	1,024	1,016	-8	-1%	1,418	1,410	-8	-1%	11710	11628	-82	-0.7%
		NB		1,501	1,488	-13	-1%	1,020	1,014	-6	-1%	811	804	-7	-1%	11933	11853	-80	-0.7%
		SB		399	396	-3	-1%	797	790	-6	-1%	1,301	1,288	-13	-1%	9208	9131	-78	-0.8%
		NB		1,563	1,549	-14	-1%	988	982	-6	-1%	774	767	-7	-1%	11740	11653	-87	-0.7%
		SB		352	350	-2	-1%	706	701	-6	-1%	1,159	1,148	-11	-1%	8169	8101	-67	-0.8%
		NB		1,365	1,353	-12	-1%	869	864	-5	-1%	684	678	-6	-1%	10319	10244	-74	-0.7%
		SB		352	350	-2	-1%	706	701	-6	-1%	1,159	1,148	-11	-1%	8169	8101	-67	-0.8%
		NB		1,365	1,353	-12	-1%	869	864	-5	-1%	684	678	-6	-1%	10319	10244	-74	-0.7%
		SB		134	133	-1	-1%	257	255	-2	-1%	430	426	-4	-1%	3003	2978	-26	-0.8%
		NB		518	513	-5	-1%	320	318	-2	-1%	259	256	-2	-1%	3843	3815	-28	-0.7%
		SB		2,172	2,154	-18	-1%	1,731	1,723	-8	0%	1,998	1,984	-14	-1%	20796	20676	-120	-0.6%
		NB		1,863	1,853	-10	-1%	1,708	1,707	-1	0%	2,290	2,286	-4	0%	20632	20596	-36	-0.2%

Chichester & Langstone Harbours SPA, Chichester & Langstone Harbours Ramsar, Solent Maritime SAC	A2030	SB	19	1,803	1,792	-11	-1%	1,656	1,649	-7	0%	1,970	1,959	-11	-1%	19495	19398	-97	-0.5%
		NB		1,418	1,418	-1	0%	1,481	1,482	1	0%	1,248	1,247	-1	0%	16048	16053	5	0.0%
		SB		1,695	1,689	-5	0%	1,656	1,649	-7	0%	1,987	1,972	-15	-1%	19326	19233	-93	-0.5%
		NB		1,520	1,522	2	0%	1,481	1,482	1	0%	1,248	1,247	-1	0%	16237	16248	11	0.1%
		SB		1,427	1,422	-5	0%	1,526	1,517	-9	-1%	1,872	1,856	-16	-1%	17640	17535	-105	-0.6%
		NB		1,585	1,580	-5	0%	1,257	1,256	0	0%	1,317	1,315	-2	0%	14845	14829	-16	-0.1%
	M27	EB	20	6,140	6,118	-22	0%	5,626	5,596	-31	-1%	6,231	6,202	-29	0%	65342	65018	-325	-0.5%
		EB		6,140	6,118	-22	0%	5,626	5,596	-31	-1%	6,231	6,202	-29	0%	65342	65018	-325	-0.5%
		EB		5,125	5,113	-13	0%	4,870	4,837	-32	-1%	5,461	5,432	-29	-1%	56336	56015	-320	-0.6%
		EB		5,125	5,113	-13	0%	4,870	4,837	-32	-1%	5,461	5,432	-29	-1%	56336	56015	-320	-0.6%
		EB		5,909	5,889	-20	0%	5,609	5,574	-34	-1%	6,484	6,462	-22	0%	65286	64952	-333	-0.5%
		EB		7,001	6,976	-25	0%	6,663	6,624	-39	-1%	7,714	7,682	-33	0%	77547	77149	-399	-0.5%
		EB		7,001	6,976	-25	0%	6,663	6,624	-39	-1%	7,714	7,682	-33	0%	77547	77149	-399	-0.5%
		EB		7,001	6,976	-25	0%	6,663	6,624	-39	-1%	7,714	7,682	-33	0%	77547	77149	-399	-0.5%
		EB		3,518	3,513	-5	0%	3,092	3,081	-11	0%	3,541	3,523	-18	-1%	36414	36288	-126	-0.3%
		EB		4,202	4,193	-10	0%	3,970	3,959	-11	0%	4,439	4,418	-21	0%	45949	45806	-143	-0.3%
		EB		3,059	3,060	1	0%	2,859	2,848	-11	0%	3,114	3,097	-17	-1%	32986	32872	-114	-0.3%
		EB		3,059	3,060	1	0%	2,859	2,848	-11	0%	3,114	3,097	-17	-1%	32986	32872	-114	-0.3%
		WB		3,019	3,012	-7	0%	2,862	2,862	-1	0%	3,113	3,114	1	0%	32930	32915	-15	0.0%
		WB		3,019	3,012	-7	0%	2,862	2,862	-1	0%	3,113	3,114	1	0%	32930	32915	-15	0.0%
		WB		4,288	4,281	-7	0%	3,750	3,746	-4	0%	4,014	4,008	-6	0%	43642	43588	-55	-0.1%
		WB		3,298	3,286	-11	0%	2,833	2,827	-6	0%	3,063	3,050	-14	0%	33142	33047	-95	-0.3%
		WB		3,298	3,286	-11	0%	2,833	2,827	-6	0%	3,063	3,050	-14	0%	33142	33047	-95	-0.3%
		WB		7,504	7,465	-40	-1%	6,235	6,214	-20	0%	7,162	7,134	-28	0%	74232	73951	-281	-0.4%
		WB		5,676	5,649	-28	0%	4,746	4,731	-15	0%	5,521	5,495	-26	0%	56575	56361	-214	-0.4%
		WB		5,676	5,649	-28	0%	4,746	4,731	-15	0%	5,521	5,495	-26	0%	56575	56361	-214	-0.4%
		WB		6,141	6,118	-23	0%	5,351	5,344	-7	0%	6,014	5,995	-18	0%	62880	62748	-131	-0.2%
		WB		6,141	6,118	-23	0%	5,351	5,344	-7	0%	6,014	5,995	-18	0%	62880	62748	-131	-0.2%
		WB		6,141	6,118	-23	0%	5,351	5,344	-7	0%	6,014	5,995	-18	0%	62880	62748	-132	-0.2%
Solent Maritime SAC	M27 J8 to J9	EB	21	6,170	6,206	36	1%	5,316	5,430	113	2%	6,544	6,696	151	2%	63741	64944	1203	1.9%
		WB		5,943	6,263	320	5%	5,462	5,578	115	2%	6,432	6,588	156	2%	64169	65925	1756	2.7%
Portsmouth Harbour SPA, Portsmouth Harbour Ramsar	A27	NB	13	2,438	2,437	0	0%	1,913	1,932	19	1%	2,426	2,427	1	0%	23484	23628	144	0.6%
		SB		2,205	2,202	-3	0%	2,048	2,050	2	0%	2,342	2,391	49	2%	23875	23985	110	0.5%
		NB		2,115	2,054	-62	-3%	1,454	1,499	45	3%	1,981	1,963	-18	-1%	18612	18791	179	1.0%
		SB		1,672	1,677	6	0%	1,526	1,584	58	4%	1,792	1,947	154	9%	17940	18685	745	4.2%
		EB		967	997	30	3%	716	712	-4	-1%	925	918	-6	-1%	8926	8940	14	0.2%
		WB		925	920	-5	-1%	737	747	11	1%	607	637	30	5%	8365	8493	128	1.5%
		EB		871	879	8	1%	513	504	-9	-2%	587	581	-6	-1%	6579	6517	-62	-0.9%
		WB		566	569	4	1%	527	525	-2	0%	678	686	8	1%	6295	6299	5	0.1%
		EB		871	879	8	1%	513	504	-9	-2%	587	581	-6	-1%	6579	6517	-62	-0.9%
		WB		566	569	4	1%	527	525	-2	0%	678	686	8	1%	6295	6299	5	0.1%
		EB		871	879	8	1%	513	504	-9	-2%	587	581	-6	-1%	6579	6517	-62	-0.9%
		WB		566	569	4	1%	527	525	-2	0%	678	686	8	1%	6295	6299	4	0.1%
	M27	NB	14	2,598	2,694	96	4%	2,025	2,051	27	1%	2,586	2,586	0	0%	24926	25301	376	1.5%
		SB		2,302	2,180	-123	-5%	1,951	1,928	-23	-1%	2,172	2,267	94	4%	23009	22798	-211	-0.9%
		SB		2,302	2,180	-123	-5%	1,951	1,928	-23	-1%	2,172	2,267	94	4%	23009	22798	-211	-0.9%
	A27/A32	NB	15	621	494	-127	-20%	487	375	-111	-23%	398	326	-72	-18%	5538	4338	-1200	-21.7%
		SB		404	598	194	48%	385	358	-27	-7%	488	409	-79	-16%	4562	4571	8	0.2%
	M275	NB	16	4,888	4,863	-25	-1%	4,314	4,321	7	0%	5,178	5,177	-1	0%	51238	51243	5	0.0%
		NB		4,888	4,863	-25	-1%	4,314	4,321	7	0%	5,178	5,177	-1	0%	51238	51243	5	0.0%
		SB		5,344	5,337	-7	0%	4,265	4,273	8	0%	5,426	5,398	-28	-1%	52224	52215	-9	0.0%
		SB		5,344	5,337	-7	0%	4,265	4,273	8	0%	5,426	5,398	-28	-1%	52224	52215	-9	0.0%
	South Street	WB	17	197	195	-2	-1%	445	442	-3	-1%	566	559	-7	-1%	4775	4733	-42	-0.9%
		EB		566	562	-4	-1%	387	384	-3	-1%	310	307	-3	-1%	4523	4488	-35	-0.8%
		WB		182	177	-5	-2%	280	278	-2	-1%	346	341	-5	-1%	3091	3056	-35	-1.1%
		EB		78	77	-1	-1%	73	72	0	-1%	80	88	8	10%	842	852	11	1.3%
Solent and Southampton Water SPA/Ramsar	Titchfield Rd	SB	2	735	732	-3	0%	706	717	11	2%	872	873	1	0%	8312	8388	76	0.9%
		NB		1,029	1,033	4	0%	911	906	-5	-1%	971	968	-3	0%	10568	10536	-33	-0.3%

Period	AM pk to 07:00-10:00	IP pk to 10:00-16:00	PM pk to 16:00-19:00	IP period to 19:00-07:00	IP period to Sat+Sun
Factors	2.618	6.000	2.793	0.567	4.534

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