

SOUTHAMPTON

CITY VISION

HABITATS REGULATIONS ASSESSMENT

Baseline
Evidence Review

○ November 2019



SOUTHAMPTON
CITY COUNCIL

Habitats Regulations Assessment for the Southampton City Vision Local Plan

Baseline Evidence Review

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1 Introduction

1.1 Purpose and Structure of this Document

1.1.1 This Baseline Evidence Review Report has been prepared for Southampton City Council (SCC) as part of the Habitats Regulations Assessment (HRA) for the Southampton City Vision Local Plan. A review of background information is presented in this report as a basis for consultation with stakeholders to inform the HRA process. It should be noted that this report does not constitute HRA screening.

1.1.2 The report is structured as follows:

- ▶ Chapter 1: introduces the document, outlines the HRA process and provides the background to the Southampton City Vision Local Plan;
- ▶ Chapter 2: identifies the European sites which are to be considered as potential receptors for likely significant effects of the plan and presents ecological information about each of the sites;
- ▶ Chapters 3 to 10: provide a review of background information in relation to each of the seven identified impact types; and
- ▶ Chapter 11: concludes the report.

1.2 Habitats Regulations Assessment Process and Methodology

1.2.1 HRA is a requirement of the Conservation of Habitats and Species Regulations 2017 ('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 likely to significantly affect (either alone or in combination) sites designated for their nature conservation importance as part of a system known collectively as the Natura 2000 network of European sites. An HRA must determine whether or not the plan or project will adversely affect the integrity of the European site(s) concerned, in view of the site's conservation objectives.

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

- 1.2.3 Further detail on HRA methodology will be set out in the HRA screening report which this Baseline Evidence Review precedes.

1.3 In-Combination Effects

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

- 1.3.2 At this early stage, those plans and projects listed below have been identified for consideration as part of the in-combination assessment:

- ▶ Extant planning permissions in Southampton which are referred to but not proposed by the Southampton City Vision Local Plan;
- ▶ River Itchen Flood Alleviation Scheme;
- ▶ Itchen Riverside Development;
- ▶ Mayflower Quarter Development;
- ▶ Bitterne Hub Development;
- ▶ Southampton Port Expansion;
- ▶ Bassett Neighbourhood Plan;
- ▶ Eastleigh Borough Local Plan (emerging);
- ▶ New Forest District Local Plan (emerging);
- ▶ Fareham Borough Local Plan (emerging);
- ▶ Test Valley Borough Revised Local Plan DPD (2011 – 2029) (adopted 2016); Partnership for Urban South Hampshire (PUSH) Spatial Position Statement 2016-2034;
- ▶ Hampshire Waste and Minerals Plan (2013);
- ▶ Hampshire Local Transport Plan 2011 – 2013;
- ▶ North Solent Shoreline Management Plan (2010) and related coastal strategies.

1.4 Southampton City Vision Local Plan

- 1.4.1 Currently the development plan for Southampton is comprised of the following documents:
- ▶ City Centre Action Plan (adopted 2015);
 - ▶ Core Strategy (adopted 2010), including the changes from the Core Strategy Partial Review (adopted 2015);
 - ▶ 'Saved' policies in the Local Plan Review (amended 2015);

- ▶ Bassett Neighbourhood Plan (made 2016);
- ▶ Hampshire Minerals and Waste Plan (adopted October 2013); and
- ▶ Community Infrastructure Levy Charging Schedule Development Plan Document (adopted 2013).

1.4.2 SCC is currently preparing a new 'Southampton City Vision Local Plan' which will plan for Southampton's continuing growth over the next 20 years through to 2040, with a view to 2050 and how the City should continue to develop. The Plan will ensure that SCC can deliver all of the new homes, workspaces, transport, retail, leisure facilities and infrastructure the city needs, whilst promoting sustainable growth and protection and enhancement of the natural and historic environment.

1.4.3 The timetable for the new Southampton City Vision Local Plan is set out in the most recent Local Development Scheme (LDS), "*Preparing Our Development Plans*" ..

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2 European Sites

2.1 Introduction

2.1.1 The European Sites that are considered in this report are:

- ▶ Emer Bog SAC;
- ▶ Mottisfont Bats SAC;
- ▶ New Forest SAC;
- ▶ River Itchen SAC;
- ▶ Solent Maritime SAC;
- ▶ Solent and Dorset Coast pSPA;
- ▶ Solent and Southampton Water SPA;
- ▶ Solent and Southampton Water Ramsar;
- ▶ The New Forest SPA; and
- ▶ The New Forest Ramsar.

2.1.2 These sites are shown in Figure 2.1.

2.1.3 The Portsmouth Harbour SPA and Ramsar and Chichester and Langstone Harbours SPA and Ramsar were also included within the scope of the Core Strategy HRA. However, the assessment did not find there to be a risk or likelihood of significant effects on these sites. With regard to the impact pathways considered in Chapters 3 to 9 of this report, there is not considered to be any potential for likely significant effects to these areas as a result of development in the Southampton City Vision Local Plan and therefore these sites are not considered further within this report.

2.2 Ecological Information about the European Sites

2.2.1 Appendix I provides detailed ecological information about each of the European Sites listed in paragraph 2.1.1, including:

- ▶ Site account;
- ▶ Qualifying features of each site (that is, the reasons for which the sites were designated);

- ▶ Conservation objectives as set out by Natural England¹ (progress towards these objectives can be taken as an indicator of favourable conservation status at the site); and
- ▶ Key environmental conditions supporting site integrity.

Conservation status

2.2.2 The conservation status of a habitat or species can be regarded to be favourable when the following criteria are met (based on the Habitats Directive, Article 1):

- ▶ The area of habitat is stable or increasing within its natural range;
- ▶ The structure and functions of the habitat necessary for its long-term maintenance continue to exist;
- ▶ The population of a species is maintaining itself as viable on a long-term basis;
- ▶ The natural range of a species is stable; and
- ▶ There is sufficient habitat to maintain the species population on a long-term basis.

2.2.3 Sites of Special Scientific Interest (SSSI) are designated for national (as opposed to international) nature conservation interest. However, SSSI boundaries often coincide with European sites and therefore can provide an indication of the conservation status of European sites as many of the ecological conditions that help to support site integrity are shared across the designations.

2.2.4 Table 2.1: Status of SSSIs Coinciding with European Sites (Source: Natural England, September 2019) sets out the status of the SSSIs coinciding with the European sites under consideration.

2.2.5 This information is helpfully supplemented by a summary of bird population trend data for the Solent provided in Stillman et al (2009) p.44, which states that:

- ▶ *“The population trends of most species wintering in the Solent reflect the trend in the respective national population. Several species, particularly wildfowl, have increased greatly in the Solent since the 1980s. By contrast, many waders (and shelduck) exhibit long-term declines. The Brent Goose population has remained stable despite a recent national decline.*
- ▶ *“There is evidence of local shifts in the location of some winter populations within the Solent, especially from Chichester and Langstone Harbours SPA to Solent and Southampton Water SPA (pintail, shoveler and black-tailed godwit). Furthermore, most species that have declined strongly in the Solent have done so primarily in Chichester and Langstone Harbours SPA (e.g. shelduck, ringed plover, dunlin, bar-tailed godwit), and those species that have increased strongly in the Solent (wigeon, teal, pintail, shoveler, black-tailed godwit) have done so primarily in Solent and Southampton Water SPA.*

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.

- ▶ *“Data on breeding birds is less systematic, but available for most years for the principal sites in the Solent. Tern populations are stable or increasing overall, and local increases are apparent in Langstone Harbour.”*

Southampton City Vision Local Plan

-  Special Areas of Conservation
-  Special Protection Areas
-  Potential Special Protection Area
-  Ramsar
-  City Boundary
-  Wards

Figure 2.1: European Sites for Consideration in the HRA



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 Ordnance Survey 0100031673
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Scale: 1:100,000 Created by: MW
 Date: Oct 2019 Reviewed by: GC
 Drawing number:
 UE0338HRA_Intl_Sites_191015

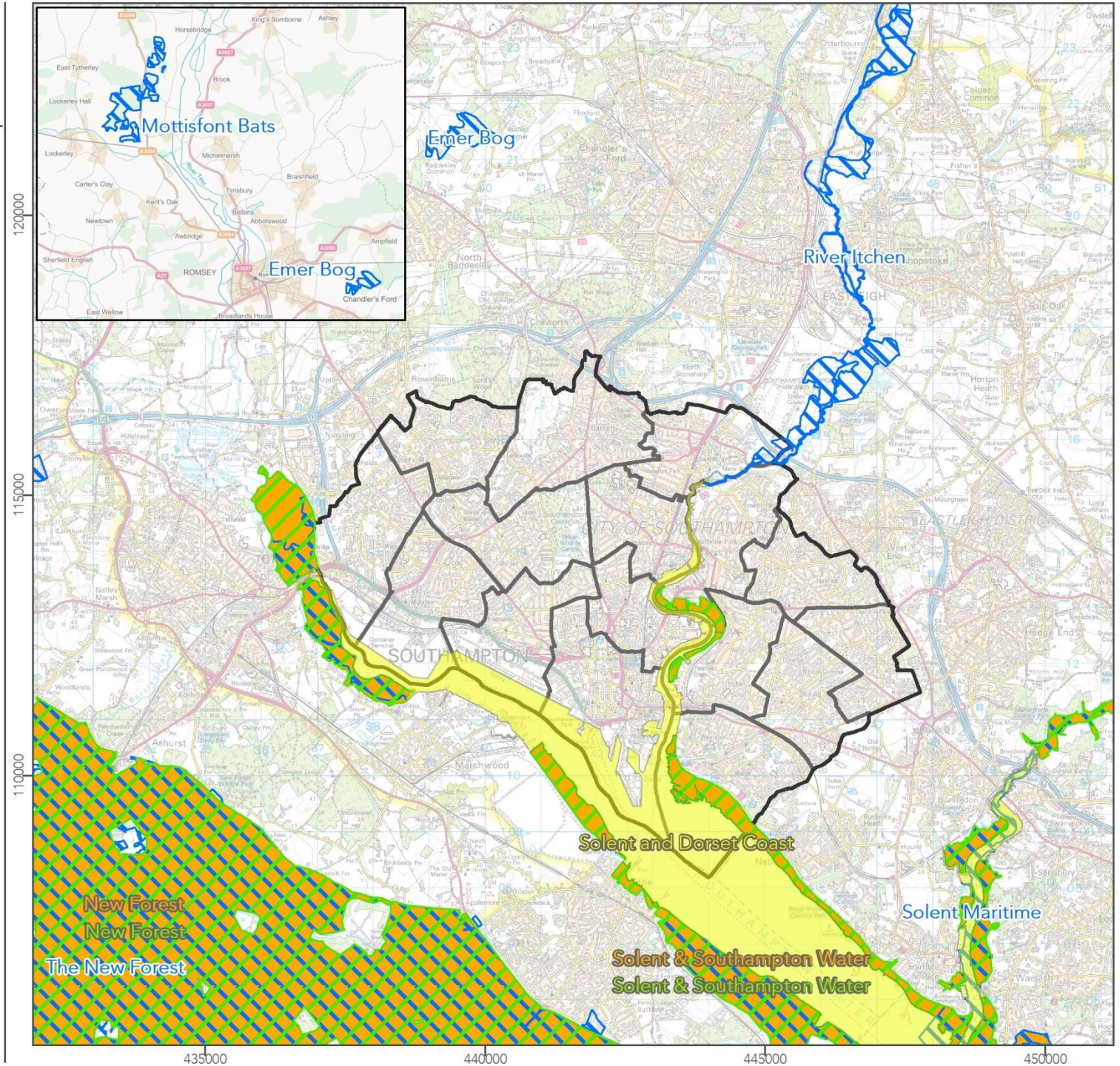


Table 2.1: Status of SSSIs Coinciding with European Sites (Source: Natural England, September 2019)

European Site Name	SSSI Name	Favourable	Unfavourable - Recovering	Unfavourable - No change	Unfavourable - Declining	Partially destroyed	Destroyed
Emerg Bog SAC	Baddesley Common	0.00%	31.02%	68.98%	0.00%	0.00%	0.00%
Mottisfont Bats SAC	Mottisfont Bats	51.78%	48.22%	0.00%	0.00%	0.00%	0.00%
New Forest SPA/Ramsar	Lymington River	0.00%	0.00%	100.00%	0.00%	0.00%	0.00%
	River Avon System	3.48%	36.96%	56.76%	2.80%	0.00%	0.00%
	The New Forest	54.54%	41.91%	2.13%	1.41%	0.00%	0.01%
	Norley Copse & Meadow	58.67%	41.33%	0.00%	0.00%	0.00%	0.00%
The New Forest SAC	Lymington River	0.00%	0.00%	100.00%	0.00%	0.00%	0.00%
	River Avon System	3.48%	36.96%	56.76%	2.80%	0.00%	0.00%
	Loosehanger Copse & Meadows	0.00%	100.00%	0.00%	0.00%	0.00%	0.00%
	Langley Wood & Homan's Copse	0.00%	0.00%	98.88%	1.12%	0.00%	0.00%
	Roydon Woods	100.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	Landford Bog	0.00%	100.00%	0.00%	0.00%	0.00%	0.00%
	Whiteparish Common	93.11%	0.00%	6.89%	0.00%	0.00%	0.00%
	The New Forest	54.54%	41.91%	2.13%	1.41%	0.00%	0.01%
River Itchen SAC	River Itchen	100.00%	0.00%	0.00%	0.00%	0.00%	0.00%

European Site Name	SSSI Name	Favourable	Unfavourable - Recovering	Unfavourable - No change	Unfavourable - Declining	Partially destroyed	Destroyed
Solent Maritime SAC	Hythe to Calshot Marshes	0.00%	89.35%	10.65%	0.00%	0.00%	0.00%
	Lee-on-the Solent to Itchen Estuary	73.40%	0.00%	26.60%	0.00%	0.00%	0.00%
	Upper Hamble Estuary & Woods	86.01%	11.23%	2.76%	0.00%	0.00%	0.00%
	Bouldnor & Hamstead Cliffs	85.14%	14.86%	0.00%	0.00%	0.00%	0.00%
	Newtown Harbour	45.12%	10.29%	44.25%	0.35%	0.00%	0.00%
	Bracklesham Bay	64.95%	35.05%	0.00%	0.00%	0.00%	0.00%
	Chichester Harbour	15.26%	3.56%	81.18%	0.00%	0.00%	0.00%
	North Solent	64.00%	34.15%	0.93%	0.91%	0.00%	0.00%
	Lower Test Valley	100.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	Langstone Harbour	8.39%	91.05%	0.56%	0.00%	0.00%	0.00%
	Thorness Bay	30.18%	0.00%	0.00%	69.82%	0.00%	0.00%
	Hurst Castle & Lymington River Estuary	21.46%	75.66%	0.00%	2.88%	0.00%	0.00%
	Yar Estuary	29.65%	1.00%	69.35%	0.00%	0.00%	0.00%
	Medina Estuary	8.87%	0.00%	91.13%	0.00%	0.00%	0.00%
King's Quay Shore	95.19%	4.62%	0.00%	0.00%	0.20%	0.00%	

European Site Name	SSSI Name	Favourable	Unfavourable - Recovering	Unfavourable - No change	Unfavourable - Declining	Partially destroyed	Destroyed
	Eling & Bury Marshes	11.45%	0.00%	88.55%	0.00%	0.00%	0.00%
	Lincegrove & Hackett's Marshes	0.00%	0.00%	100.00%	0.00%	0.00%	0.00%
Solent and Southampton Water SPA / Ramsar	Hythe to Calshot Marshes	0.00%	89.35%	10.65%	0.00%	0.00%	0.00%
	Upper Hamble Estuary & Woods	86.01%	11.23%	2.76%	0.00%	0.00%	0.00%
	Newtown Harbour	45.12%	10.29%	44.25%	0.35%	0.00%	0.00%
	Titchfield Haven	0.00%	96.48%	0.00%	3.52%	0.00%	0.00%
	Sowley Pond	100.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	The New Forest	54.54%	41.91%	2.13%	1.41%	0.00%	0.01%
	North Solent	64.00%	34.15%	0.93%	0.91%	0.00%	0.00%
	Lymington River Reed Beds	35.50%	64.50%	0.00%	0.00%	0.00%	0.00%
	Thorness Bay	30.18%	0.00%	0.00%	69.82%	0.00%	0.00%
	Lincegrove & Hackett's Marshes	0.00%	0.00%	100.00%	0.00%	0.00%	0.00%
	River Test	17.91%	37.53%	43.52%	1.03%	0.00%	0.00%
	Hurst Castle & Lymington River Estuary	21.46%	75.66%	0.00%	2.88%	0.00%	0.00%
	Yar Estuary	29.65%	1.00%	69.35%	0.00%	0.00%	0.00%
Whitecliff Bay & Bembridge	99.07%	0.00%	0.93%	0.00%	0.00%	0.00%	

European Site Name	SSSI Name	Favourable	Unfavourable - Recovering	Unfavourable - No change	Unfavourable - Declining	Partially destroyed	Destroyed
	Ledges						
	Medina Estuary	8.87%	0.00%	91.13%	0.00%	0.00%	0.00%
	King's Quay Shore	95.19%	4.62%	0.00%	0.00%	0.20%	0.00%
	Eling & Bury Marshes	11.45%	0.00%	88.55%	0.00%	0.00%	0.00%
	Lower Test Valley	100.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	Lymington River	0.00%	0.00%	100.00%	0.00%	0.00%	0.00%
	Brading Marshes to St Helen's Ledges	13.54%	46.69%	27.97%	11.80%	0.00%	0.00%
	Ryde Sands & Wootton Creek	0.99%	26.58%	72.42%	0.00%	0.00%	0.00%
	Lee-on-the Solent to Itchen Estuary	73.40%	0.00%	26.60%	0.00%	0.00%	0.00%
Solent and Dorset Coast pSPA*	Dibden Bay	98.00%	0.00%	0.00%	2.00%	0.00%	0.00%
	Hythe to Calshot Marshes	0.00%	89.35%	10.65%	0.00%	0.00%	0.00%
	Lee-on-the Solent to Itchen Estuary	73.40%	0.00%	26.60%	0.00%	0.00%	0.00%
	Lincegrove and Hackett's Marshes	0.00%	0.00%	100.00%	0.00%	0.00%	0.00%
	North Solent	64.00%	34.15%	0.93%	0.91%	0.00%	0.00%

European Site Name	SSSI Name	Favourable	Unfavourable - Recovering	Unfavourable - No change	Unfavourable - Declining	Partially destroyed	Destroyed
	Titchfield Haven	0.00%	96.48%	0.00%	3.52%	0.00%	0.00%
	Upper Hamble Estuary and Woods	86.01%	11.23%	2.76%	0.00%	0.00%	0.00%

**The pSPA is located along the coasts of Dorset, Hampshire, Isle of Wight and West Sussex and adjacent areas offshore. The SSSIs listed here correspond to the intertidal areas abutting the pSPA around Southampton*

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3 Atmospheric Pollution

3.1 Description of Impact

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

3.1.2 The following descriptions draw on information presented through the Air Pollution Information Systems (APIS)² and the Institute of Air Quality guidance (IAQM, 2019). The main pollutants of interest are:

- ▶ Nitrogen oxides (NO_x) produced through combustion processes, with half of UK emissions from road traffic;
- ▶ Ammonia (NH₃), the main source of which is agriculture (e.g. manures and fertilisers); and
- ▶ Sulphur dioxide (SO₂), the majority of which comes from combustion of sulphur containing fuel in electricity generation.

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

3.1.4 Direct exposure of vegetation to NO_x, SO₂ and NH₃ has phytotoxic effects, especially in areas close to sources, such as roadside verges; lichens and bryophytes (which include mosses, liverworts and hornworts) are particularly vulnerable to these sorts of toxic effects, which can result in changes to plant growth, changes in the plant's ability to assimilate CO₂, and biochemical effects.

3.1.5 Indirect effects through deposition include:

- ▶ Acid deposition: acid deposition is most likely to affect vegetation indirectly through changes to soil properties. SO₂, NO_x and ammonium (from NH₃) react with rain/cloudwater to form nitric (or sulphuric) acid. Increases in soil acidity can increase the mobility of certain toxic metals which can result in root damage, stunted growth and reduced microbial activity. These effects can lead to changes in species composition.
- ▶ Eutrophication by nitrogen deposition: dry deposition of NO_x is greatest within large conurbations and close to major roads. Whilst nitrogen is essential for plant growth, excessive amounts can become toxic, as instead of acting as a nutrient, nitrogen

² Online at: <http://www.apis.ac.uk/> [Accessed 14/8/19]

becomes a pollutant. Many semi-natural plants (including bryophytes) do not have the capacity to assimilate nitrogen when excess nitrogen is available and can therefore be outcompeted by plants that can (such as many grass species), through shading and inability to compete for other limiting resources. Overall this can lead to long term compositional changes in vegetation and reduced diversity, and potentially changes to habitat structure. 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)).

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

3.2 Sites Potentially Affected

- 3.2.1 Emissions from road transport currently make the largest single contribution to atmospheric NO_x in the UK, accounting for 33% in 2010, with an estimated 92% of those associated with residential development being contributed by road traffic (Dore *et al*, 2003). 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)).
- 3.2.2 Generation of additional road traffic emissions associated with development under the new Local Plan could result in significant effects at European sites. Guidance from Natural England (2018) advises that if there are qualifying features of a European site within 200m of a road, and proposed development results in changes in annual average daily traffic flow (AADT) which exceed Design Manual for Roads and Bridges (DMRB) screening criteria³ (1,000 vehicles or 200 heavy duty vehicles) or contributes more than 1% of the long-term critical load or level for the qualifying feature, then appropriate assessment is required.

³ The 2017 Wealden judgment has clarified that, if the DMRB screening criteria are used, they should be used to screen in-combination impacts as well as the project/plan alone.

3.2.3 With the exception of Emer Bog SAC and Mottisfont Bats SAC, all of the sites considered in this report are crossed by or lie within 200m of one or more major roads (A roads or motorways) that link with Southampton's strategic road network. Natural England's Site Improvement Plans list air pollution in the form of atmospheric nitrogen deposition as a current pressure or future threat to all of these remaining sites with the exception of the River Itchen SAC. There is no Site Improvement Plan for the Dorset and Solent Coast pSPA at present.

3.3 Extent of Impact at Present

3.3.1 Table 3.1 sets out the critical loads and levels for the most sensitive habitat at each of the European sites under consideration. Table 3.2 to Table 3.4 provide information on background critical loads and levels, and exceedances recorded for Nutrient Nitrogen, Acidity, NH₃, NO_x and SO₂ at key locations where parts of the strategic road network pass through or within 200 metres of the European sites under consideration; these locations are shown on Figure 3.1 to Figure 3.3. The figures are derived from the Air Pollution Information System (APIS) database for the data period 2015 to 2017. One habitat type representative of the point location has been selected in order to interrogate APIS. The data in these tables highlight the following:

- ▶ Rates of nitrogen deposition exceed critical loads for some sensitive features of the New SAC / SPA / Ramsar near the M27/A31, A35 and the A36, and of the River Itchen SAC near the M27/A27, A34 and M3 (north).
- ▶ Critical levels of NO_x are exceeded at some sensitive features within the Solent and Southampton Water SPA / Ramsar and Solent Maritime SAC in close proximity to the M27, A27, M271 and A3024.
- ▶ Critical levels of NH₃ are exceeded at some sensitive features within the New SAC / SPA / Ramsar near the A35 and the A36.
- ▶ Critical levels of SO₂ are not exceeded at any of these sites.
- ▶ Rates of acid deposition exceed critical loads for some sensitive features of the New SAC / SPA / Ramsar near the M27/A31, A35 and the A36.

3.4 Potential Impact of the Local Plan

3.4.1 In 2018 the Partnership for South Hampshire (PFSH), previously known as the Partnership for Urban South Hampshire (PUSH)⁴, published the results of an assessment of air quality impacts to support the PFSH local planning authorities in carrying out their reviews of the spatial strategy for the area (Ricardo, 2018). Dispersion modelling was carried out across the study area at a resolution of 3m x 3m. Traffic growth within the study area was provided by Solent Transport's Sub-Regional Transport Model (SRTM) taking account of future proposed development and housing in the sub-region, as well as the Isle of Wight and part of the New Forest District. Air quality impacts in the New Forest and Isle of Wight were not however considered as part of the study as these are to be addressed in separate studies.

⁴ On 4 June 2019 the decision was taken to re-name the partnership so that it better represented its membership including authorities outside of South Hampshire's urban centres – in particular the New Forest.

3.4.2 Modelling was undertaken for four scenarios:

- ▶ 2014 Reference Case;
- ▶ 2034 Baseline Scenario;
- ▶ 2034 Do Minimum (DM) Scenario: includes forecast development within the sub-region; and
- ▶ 2034 Do Something (DS) Scenario: includes forecast development within the sub-region and transport interventions aimed at mitigating impact of proposed developments on transport network.

3.4.3 Air quality impacts on European sites were assessed based on predicted annual average airborne concentrations of oxides of nitrogen (NO_x) and ammonia (NH₃), as well as annual deposition of nutrient nitrogen and acid. Modelled levels were compared to the critical load and levels for these pollutants at each site taken from APIS. Designated sites within 300m of the PfSH boundary were included in the study; therefore the New Forest SAC/SPA/Ramsar and Mottisfont Bats SAC were not included. The Dorset and Solent Coast pSPA was also not included.

3.4.4 The results of the study indicate that the 1% screening threshold would be exceeded in both the DM and DS scenarios for all four pollutants at the following sites:

- ▶ River Itchen SAC;
- ▶ Solent Maritime SAC; and
- ▶ Solent and Southampton Water SPA/Ramsar.

3.4.5 The 1% screening threshold was not exceeded at Emer Bog SAC for any of the modelled pollutants in either the DM or DS scenario and therefore the results suggest that no likely significant effects to Emer Bog SAC are anticipated from road traffic emissions as a result of the Local Plan. However, likely significant effects resulting from atmospheric pollution cannot be ruled out for the River Itchen SAC, Solent Maritime SAC and the Solent and Southampton Water SPA/Ramsar.

3.4.6 As discussed above, the New Forest sites and the Dorset and Solent Coast pSPA were excluded from the PfSH study. The potential effects of atmospheric pollution on the New Forest sites will be considered within the HRA because Southampton's strategic road network crosses or passes within 200m of the New Forest at multiple locations (Figure 3.1) including:

- ▶ M27/A31;
- ▶ A36;
- ▶ A336.
- ▶ A35;
- ▶ A326; and

3.4.7 The Solent and Dorset Coast pSPA is proposed for designation to protect the foraging habitats of terns *Sterna spp.* breeding in Poole, Chichester, Langstone and Pagham Harbours, and in the Solent. These species plunge-dive for fish and given the vast area of the pSPA and limited scope for aerial pollution to affect their prey, it is unlikely that the traffic and pollution impacts of the Local Plan will significantly affect the pSPA.

Southampton City Vision Local Plan

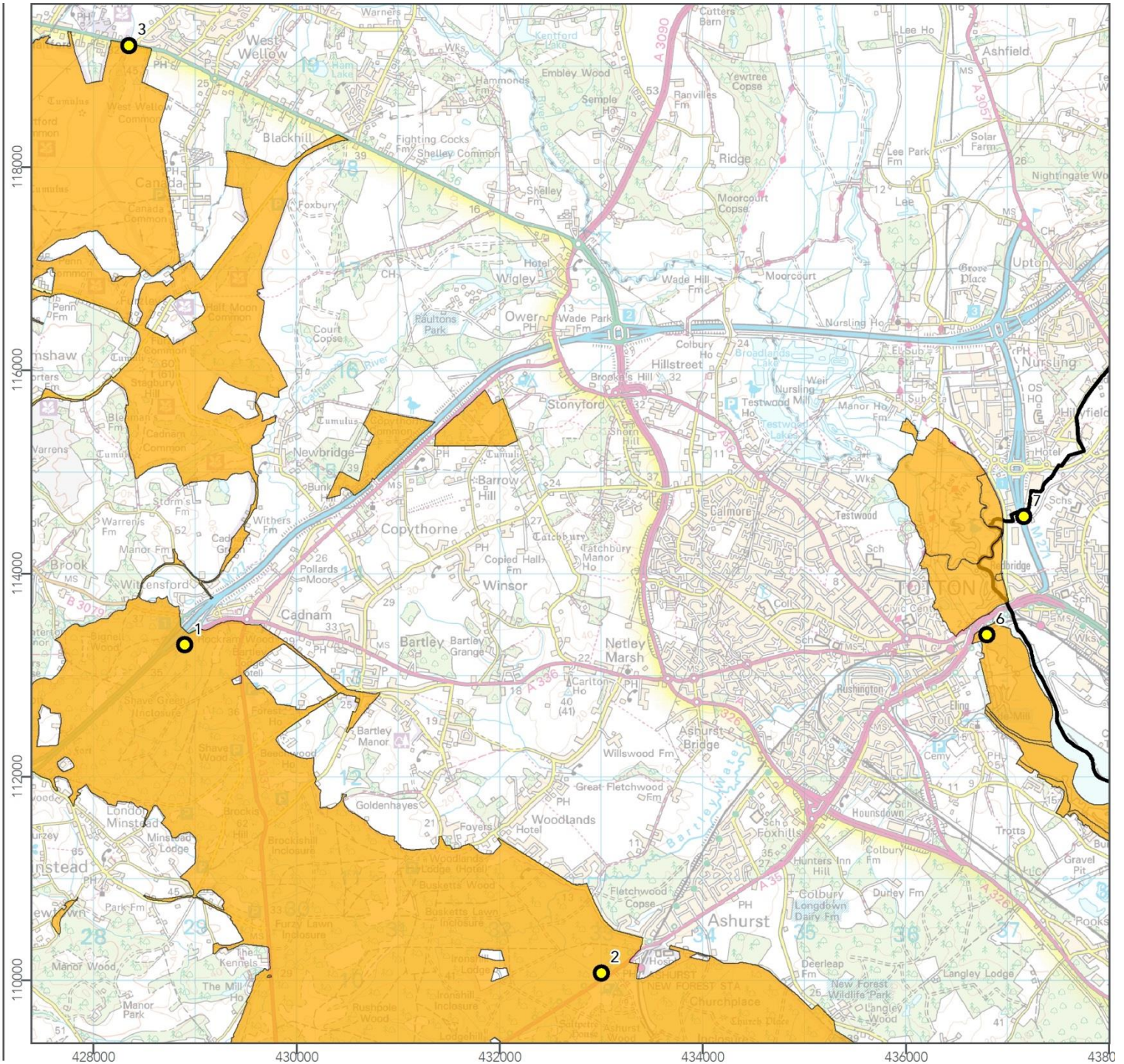
-  European Site / Strategic Road Network Intersect (within 200m)
-  European Sites
-  City Boundary

Figure 3.1: Strategic Road Network in Relation to European Sites (West)



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Scale: 1:55,000 **Created by:** MW
Date: Oct 2019 **Reviewed by:** GC
Drawing number:
 UE0338SEA_EuropeanSite_RoadIntersect(West)_191016



Southampton City Vision Local Plan

-  European Site / Strategic Road Network Intersect (within 200m)
-  European Sites
-  City Boundary

Figure 3.3: Strategic Road Network in Relation to European Sites (North)



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Scale: 1:35,000 **Created by:** MW
Date: Oct 2019 **Reviewed by:** GC
Drawing number:
 UE0338SEA_EuropeanSite_RoadIntersect(North)_191016



Table 3.1: Minimum Critical Load and Levels and Associated Sensitive Features for European Designated Sites (Source: APIS, 2019)

Site Name	Nutrient Nitrogen		Acidity		Ammonia (NH ₃)		Nitrogen Oxides (NO _x)		Sulphur Dioxide (SO ₂)	
	Empirical Minimum Critical Load (kg N/ha/yr)	Sensitive Feature	Acidity Critical Load (keq MinCLminN)	Sensitive Feature	Critical Level (µg NH ₃ /m ³ annual mean)	Sensitive Feature	Critical Level (µg NO _x /m ³ annual mean)	Sensitive Feature	Critical Level (µg SO ₂ /m ³ annual mean)	Sensitive Feature
River Itchen SAC	10	<i>Coenagrion mercuriale</i> - Southern damselfly	0.499	<i>Coenagrion mercuriale</i> - Southern damselfly	3	<i>Coenagrion mercuriale</i> - Southern damselfly	30	<i>Coenagrion mercuriale</i> - Southern damselfly	10	Water courses of plain to montane levels
Solent Maritime SAC	8	Perennial vegetation of stony banks	0.223	Perennial vegetation of stony banks	3	<i>Vertigo moulinsiana</i> Desmoulin's whorl snail	30	Estuaries	10	Estuaries
Solent and Southampton Water SPA/Ramsar	8	<i>Sterna sandvicensis</i> (Western Europe/Western Africa) - Sandwich tern	0.223	<i>Sterna sandvicensis</i> (Western Europe/Western Africa) - Sandwich tern	3	<i>Anas crecca</i> (North-western Europe) - Eurasian teal	30	<i>Anas crecca</i> (North-western Europe) - Eurasian teal	No critical levels assigned for any qualifying features	
New Forest SAC	3	Oligotrophic to mesotrophic standing waters	0.321	Transition mires and quaking bogs	1	Northern Atlantic wet heaths with <i>Erica tetralix</i>	30	Northern Atlantic wet heaths with <i>Erica tetralix</i>	10	Northern Atlantic wet heaths with <i>Erica tetralix</i>
The New Forest SPA/Ramsar	5	<i>Caprimulgus europaeus</i> - European nightjar	0.499	<i>Circus cyaneus</i> - Hen harrier	3	<i>Pernis apivorus</i> - European honey-buzzard	30	<i>Pernis apivorus</i> - European honey-buzzard	No critical levels assigned for any qualifying features	

Table 3.2: Background critical loads and levels: New Forest SAC / SPA / Ramsar 2015 – 2017 (Source: APIS, 2019)

New Forest SAC / SPA / Ramsar			
Location Point 1: M27/A31 passes through the Site (428900,113300 NGR) Broadleaved, Mixed and Yew Woodland			
Pollutant	Critical Load / Level	Deposition / Concentration	Exceedance
N Deposition (kg N/ha/year)	10	21.84	11.84
NO _x (µg m ⁻³)	30	18.98	-11.02
Acidity (keq/ha/yr)	0.357	1.67	1.313
NH ₃	1.0	1.0	0
SO ₂	20	0.74	-19.26
Location Point 2: A35 passes through the Site (433004,110069 NGR) Broadleaved, Mixed and Yew Woodland			
Pollutant	Critical Load / Level	Deposition / Concentration	Exceedance
N Deposition (kg N/ha/year)	10	24.22	14.22
NO _x (µg m ⁻³)	30	17.18	-12.82
Acidity (keq/ha/yr)	0.357	1.87	1.513
NH ₃	1.0	1.26	0.26
SO ₂	20	1.15	-18.85
Location Point 3: A36 passes through the Site (428348,119200 NGR) Dwarf Scrub Heath			
Pollutant	Critical Load / Level	Deposition / Concentration	Exceedance
N Deposition (kg N/ha/year)	10	16.38	6.38
NO _x (µg m ⁻³)	30	14.38	-15.26
Acidity (keq/ha/yr)	0.91	1.31	0.40
NH ₃	1.0	1.35	0.35
SO ₂	20	0.81	-19.19

Table 3.3: Background critical loads and levels: Solent and Southampton Water SPA / Ramsar and Solent Maritime SAC 2015 – 2017 (Source: APIS, 2019)

Solent and Southampton Water SPA / Ramsar and Solent Maritime SAC			
Location Point 4: M27 passes through the Site (449962, 110378 NGR)			
Coastal Saltmarsh			
Pollutant	Critical Load / Level	Deposition / Concentration	Exceedance
N Deposition (kg N/ha/year)	20	19.04	-0.96
NOx ($\mu\text{g m}^{-3}$)	30	38.55	8.55
Acidity (keq/ha/yr)	No comparable acid critical load	1.59	-
NH ₃	1.0	1.79	0.79
SO ₂	20	2.24	-17.76
Location Point 5: A27 passes through the Site (449270,109270 NGR)			
Coastal Saltmarsh			
Pollutant	Critical Load / Level	Deposition / Concentration	Exceedance
N Deposition (kg N/ha/year)	20	14.42	-5.58
NOx ($\mu\text{g m}^{-3}$)	30	30.36	0.36
Acidity (keq/ha/yr)	No comparable acid critical load	1.38	-
NH ₃	1.0	1.08	0.08
SO ₂	20	4.45	-15.55
Location Point 6: A35/A36 passes through the Site (NGR 436800,113400)			
Coastal Saltmarsh			
Pollutant	Critical Load / Level	Deposition / Concentration	Exceedance
N Deposition (kg N/ha/year)	20	15.96	-4.04
NOx ($\mu\text{g m}^{-3}$)	30	29.32	-0.68
Acidity (keq/ha/yr)	No comparable acid critical load	1.33	-
NH ₃	1.0	1.28	0.28
SO ₂	20	1.48	-18.52
Location Point 7: M271 passes within 200m of the Site (NGR 437165,114562)			

Solent and Southampton Water SPA / Ramsar and Solent Maritime SAC			
Coastal Saltmarsh			
Pollutant	Critical Load / Level	Deposition / Concentration	Exceedance
N Deposition (kg N/ha/year)	20	15.96	-4.04
NO _x (µg m ⁻³)	30	30.72	0.72
Acidity (keq/ha/yr)	No comparable acid critical load	1.33	-
NH ₃	1.0	1.28	0.28
SO ₂	20	1.48	-18.52
Location Point 8: A3024 passes through Site (NGR 443430,113150)			
Coastal Saltmarsh			
Pollutant	Critical Load / Level	Deposition / Concentration	Exceedance
N Deposition (kg N/ha/year)	20	17.22	-2.78
NO _x (µg m ⁻³)	30	36.58	6.58
Acidity (keq/ha/yr)	No comparable acid critical load	1.49	-
NH ₃	1.0	1.43	0.43
SO ₂	20	2.65	-17.35

Table 3.4: Background critical loads and levels: River Itchen SAC 2015 – 2017 (Source: APIS, 2019)

River Itchen SAC			
Location Point 9: M27/A27 passes through the Site (445393, 115715 NGR) Fen, Marsh and Swamp			
Pollutant	Critical Load / Level	Deposition / Concentration	Exceedance
N Deposition (kg N/ha/year)	10	18.34	8.34
NOx ($\mu\text{g m}^{-3}$)	30	42.84	12.84
Acidity (keq/ha/yr)	This habitat is not sensitive to acidity	1.49	-
NH ₃	1.0	1.79	0.79
SO ₂	20	1.34	-18.66
Location Point 10: M3 (south) passes through the Site (447818,126603 NGR) Coastal and Floodplain Grazing Marsh			
Pollutant	Critical Load / Level	Deposition / Concentration	Exceedance
N Deposition (kg N/ha/year)	20	19.32	-0.68
NOx ($\mu\text{g m}^{-3}$)	30	34.81	4.81
Acidity (keq/ha/yr)	No comparable acid critical load	1.52	-
NH ₃	1.0	1.86	0.86
SO ₂	20	0.9	-19.1
Location Point 11: A34 passes through the Site (449400,131700 NGR) Fen, Marsh and Swamp			
Pollutant	Critical Load / Level	Deposition / Concentration	Exceedance
N Deposition (kg N/ha/year)	10	20.3	10.3
NOx ($\mu\text{g m}^{-3}$)	30	28.58	-1.42
Acidity (keq/ha/yr)	This habitat is not sensitive to acidity	1.58	-
NH ₃	1.0	2.05	1.05
SO ₂	20	0.76	-19.24

River Itchen SAC			
Location Point 13: M3 (north) passes through the Site (450392,132544 NGR) Coastal and Floodplain Grazing Marsh			
Pollutant	Critical Load / Level	Deposition / Concentration	Exceedance
N Deposition (kg N/ha/year)	10	18.2	8.2
NO _x (µg m ⁻³)	30	22.22	-7.78
Acidity (keq/ha/yr)	No comparable acid critical load	1.43	-
NH ₃	1.0	1.63	0.63
SO ₂	20	0.7	-19.3

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4 Flood Risk and Coastal Squeeze

4.1 Description of Impact

- 4.1.1 Coastal habitats naturally migrate landward as sea levels rise over time and where there are no barriers preventing this. Coastal squeeze occurs when manmade structures, such as sea defences, prevent landward migration and therefore the coastal habitat is squeezed against the manmade structure and eventually lost. The European designated sites along the Solent are at risk from the loss and fragmentation of their qualifying habitats due to this phenomenon.
- 4.1.2 Southampton has approximately 35km of tidal frontage, including the River Test and River Itchen estuaries, with the tidal influence of these rivers extending through much of the city's administrative boundary. Approximately 13% of the city is identified as currently at high or medium risk of flooding from tidal sources (SCC, 2017).
- 4.1.3 The Southampton coastline is covered by the North Solent Shoreline Management Plan (SMP) (NFDC, 2010). The SMP recommends a long term policy of 'hold the line' (HTL) for the stretch of coastline within Southampton. A policy of HTL means the existing level of protection will be maintained and upgraded where it is economically viable to do so, in order to protect life and property along the extensively developed sections of the estuaries (NFDC, 2010). This policy however has potential impacts on designated sites via coastal squeeze.
- 4.1.4 The Southampton Coastal Management Strategy (URS, 2012) sits beneath the North Solent SMP and focuses on long term management of a 22km of stretch of the City's coastline spanning from Woodmill to Redbridge in order to achieve the HTL policy. The River Itchen, Weston Shore, Netley & Hamble Coastal Study (Mouchel, 2011) was completed in November 2011 and covers the east bank of the River Itchen as far upstream as Woodmill Lane Bridge, the Weston, Netley and Hamble-le-Rice section, and both banks of the River Hamble as far upstream as the Bursledon Railway Bridge. The Study was initially designed to deliver a formal Coastal Defence Strategy, but due to the minimal need for coastal erosion or flood defence schemes in the area it was not considered appropriate to take the study forward to a formal Coastal Defence Strategy. Notwithstanding this, the study provided technical input to the SMP and may still provide technical support for any future coastal projects and schemes.

4.2 Sites Potentially Affected

- 4.2.1 The Local Plan area encompasses the entire city and consequently, designated habitats running along the coastline and Rivers Itchen and Test could be affected directly by new sea defences intended to protect existing and new development and indirectly through coastal squeeze. Impacts including disturbance from noise, vibration, human presence, lighting and mobilisation of silt, arising from construction activities associated with installation of new sea defences, could also affect Atlantic salmon *Salmo salar*, a qualifying feature of the River Itchen SAC.

- 4.2.2 Maintenance and improvement of flood defences may therefore have impacts on the Solent Maritime SAC, Solent and Southampton Water SPA and Ramsar site, the Solent and Dorset Coast pSPA and the River Itchen SAC.

4.3 Extent of Impact at Present

Flood risk in Southampton

- 4.3.1 The Southampton Level 2 Strategic Flood Risk Assessment (SFRA) (SCC, 2017) assessed the flood risk from six sources of flooding: tidal, fluvial, pluvial, groundwater, sewers and artificial sources (e.g. reservoirs). Those of particular interest with respect to the HRA are tidal and fluvial flood risk.
- 4.3.2 Southampton does not currently benefit from any formal raised defences to provide protection against flooding from rivers or the sea (SCC, 2017). There are some isolated areas of raised erosion structures which are in private ownership, therefore the condition and standard of protection offered is highly variable (Figure 4.1).
- 4.3.3 With regard to tidal flooding, Figure 4.2 shows the current and future (2075 and 2115) extent of tidal flood risk in the City. The main areas at risk are located on the lower ground either side of the River Itchen. Further upstream on the River Itchen, flooding is predominantly limited to gardens of private property; however this may reach buildings and properties on the west bank of the Itchen. The combined effect of fluvial and tidal flooding means some areas in Millbrook are at risk of flooding. Some areas of Redbridge, along the River Test are also at risk of flooding. Projected increases in tidal levels by 2055 (beyond the Southampton City Vision Plan period) increase flood extents in Northam, St Marys and Chapel. The sewage treatment works at Portswood is also at high risk of flooding, raising the risk of pollution.
- 4.3.4 Figure 4.3 identifies the flood zones Flood Zones which indicate the areas with a 'high' or 'medium' probability of fluvial flooding based on the present day. At present flooding on Tanners Brook and Holly Brook is predicted to be predominantly limited to the open space either side of the watercourse, however a few nearby properties are also at risk. Flooding on the fluvial River Itchen and Monks Brook is also predominantly limited to the open space surrounding the watercourse, although flooding has occurred to the A27 at Woodmill Lane and businesses here are at risk.

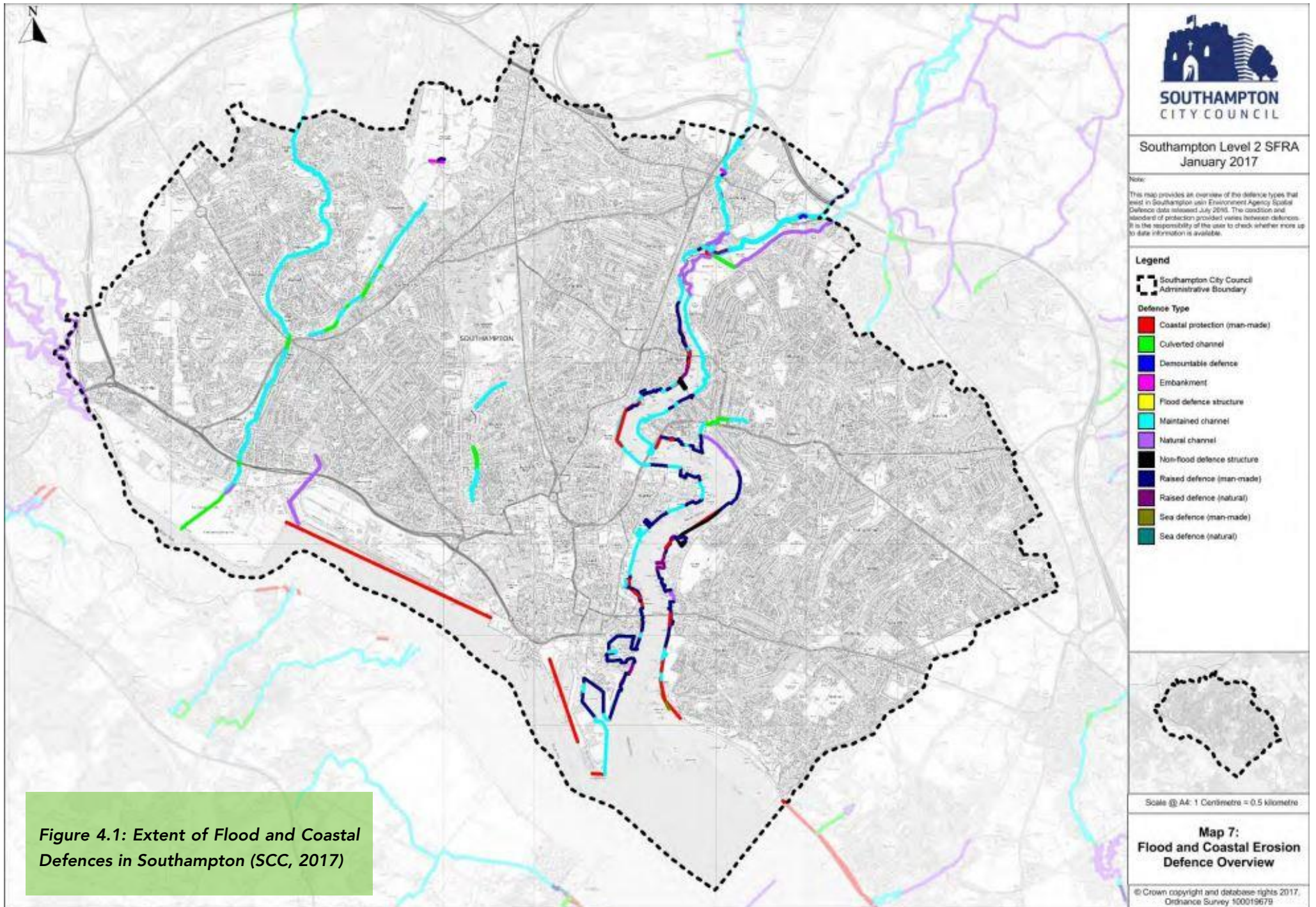


Figure 4.1: Extent of Flood and Coastal Defences in Southampton (SCC, 2017)

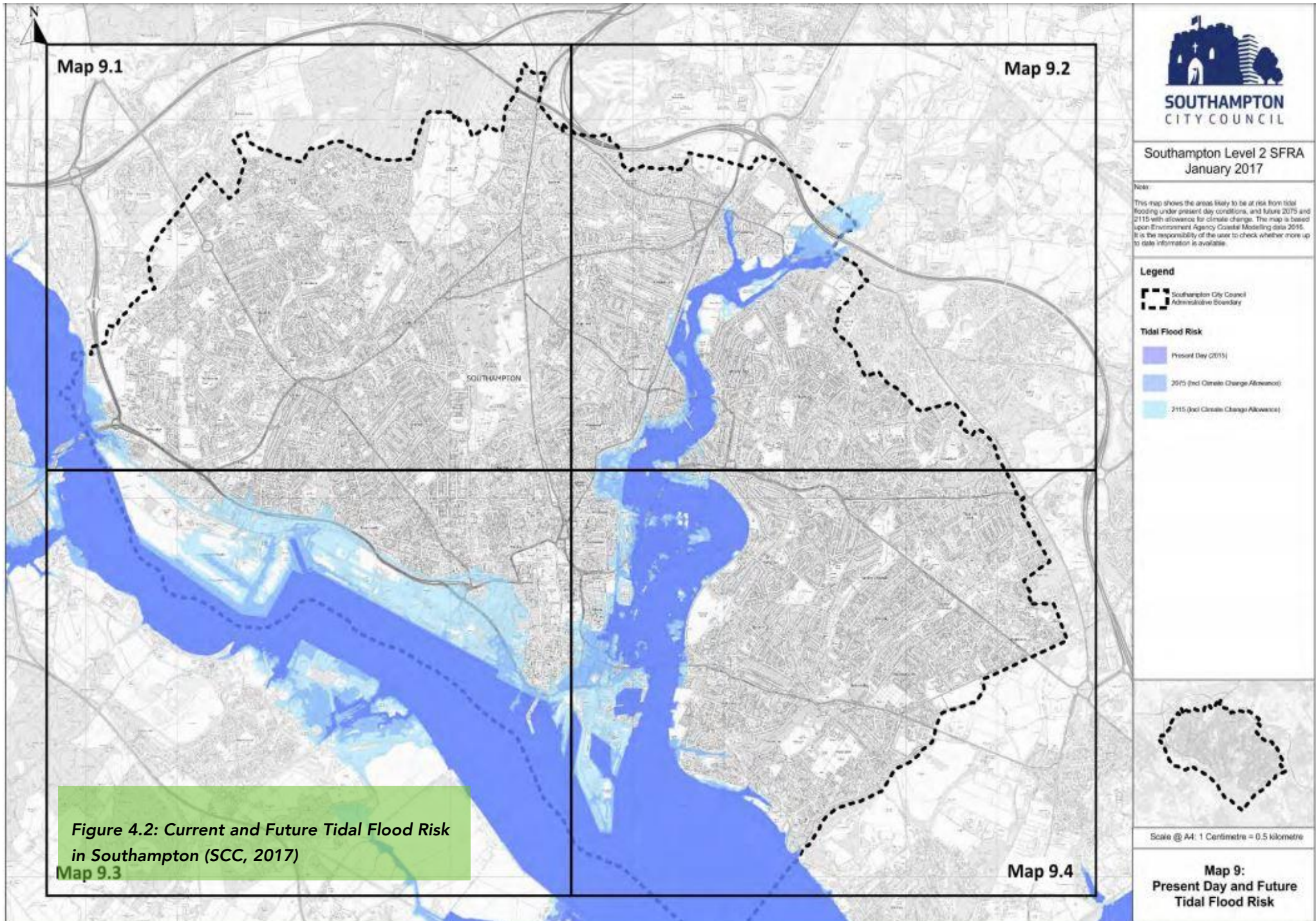


Figure 4.2: Current and Future Tidal Flood Risk in Southampton (SCC, 2017)

Map 9.3

Scale @ A4: 1 Centimetre = 0.5 kilometre

Map 9: Present Day and Future Tidal Flood Risk

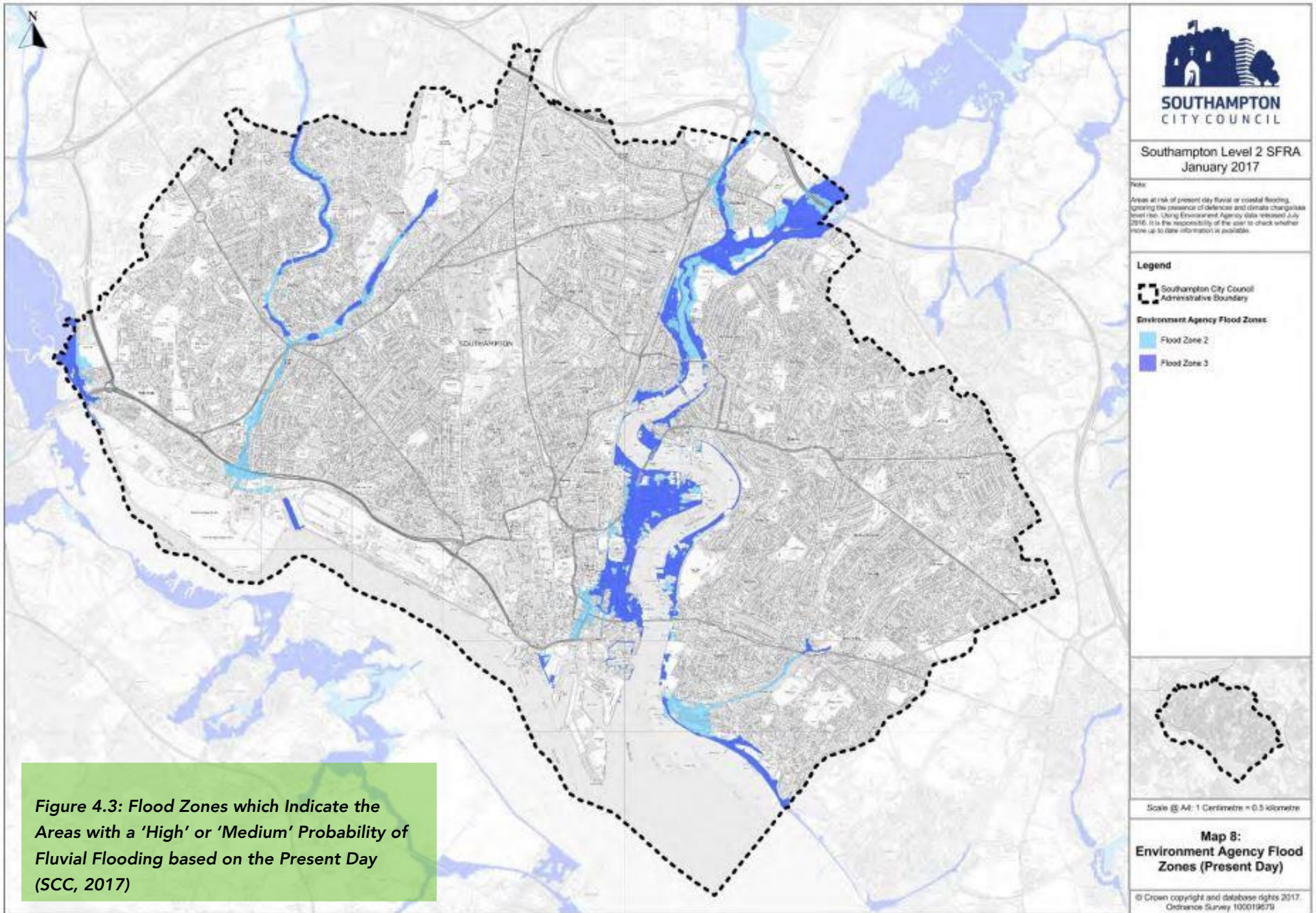


Figure 4.3: Flood Zones which Indicate the Areas with a 'High' or 'Medium' Probability of Fluvial Flooding based on the Present Day (SCC, 2017)

SOUTHAMPTON CITY COUNCIL

Southampton Level 2 SFRA
January 2017

Note:
Areas at risk of present day fluvial or coastal flooding, ignoring the presence of defences and climate change sea level rise. Using Environment Agency data released July 2016. It is the responsibility of the user to check whether more up to date information is available.

Legend

- Southampton City Council Administrative Boundary

Environment Agency Flood Zones:

- Flood Zone 2
- Flood Zone 3

Scale @ A4: 1 Centimetre = 0.5 kilometre

**Map 8:
Environment Agency Flood Zones (Present Day)**

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Coastal squeeze

- 4.3.5 The Site Improvement Plan for the Solent (Natural England, 2014, which covers the Solent Maritime SAC and the Solent and Southampton Water SPA/Ramsar, highlights coastal squeeze as a current threat to these sites resulting in the direct loss of habitats within the SAC such as saltmarsh; there is also an impact on birds due to the loss of habitat for feeding, roosting and breeding. In some areas rising sea levels will result in coastal grasslands being lost to more saline grasslands, thus losing habitat for some breeding waders of the waterbird assemblage.
- 4.3.6 The Solent Dynamic Coast Project (Cope et al., 2008) was conducted to inform development of the North Solent SMP (NFDC, 2010). The project confirmed habitat losses and gains of +60 hectares for mudflat and -812 hectares for saltmarsh over the next 100 years calculated by the Solent Coastal Habitats Management Plan (Bray and Cottle, 2003). Intertidal coastal squeeze resulting from maintenance of all existing defences (causing coastal squeeze) across the north Solent over the next 100 years was estimated to be approximately 5 hectares of mudflat and 495-595 hectares of saltmarsh. The Project also looked at habitat creation opportunities across the Solent. Of 3,883 hectares identified, only 552 hectares were considered suitable to offset the projected loss.

North Solent SMP

- 4.3.2 The SMP policy units covering Southampton are as follows:
- ▶ 5c10 Netley Castle to Weston Point
 - ▶ 5c11 Weston Point to Woodmill Lane
 - ▶ 5c12 Woodmill Lane to Redbridge
 - ▶ 5c13 Lower Test Valley
- 4.3.7 These policy units can be seen in see Figure 4.4 below.



Figure 4.4 Map of SMP Policy Units (Source NFDC, 2010)

4.3.8 The policies for Units 5c10 to 5c13 are shown in Table 4.1 below.

Table 4.1: Shoreline Management Policies for Units in Southampton

Policy Units	Start of Unit	End of Unit	Epoch 1 0-20 yrs	Epoch 2 20-50 yrs	Epoch 3 50-100 yrs
5C10	Netley Castle	Weston Point	HTL	HTL	HTL
5C11	Weston Point	Woodmill Lane	HTL	HTL	NAI*
5C12	Woodmill Lane	Redbridge	HTL	HTL	HTL
5C13	Lower Test Valley	Lower Test Valley	NAI	NAI	NAI

Key - HTL = Hold the Line; MR = Managed Realignment NAI = No Active Intervention; NPFA = No Public Funding Available; RTE = Regulated Tidal Exchange
 * Requirement for more detailed study for management for management of site that recognises coastal change and investigates property level defence options

4.3.4 In order to assess the coastal squeeze risks associated with the ‘HTL’ policy the SMP Appropriate Assessment (NFDC, 2010 Appendix J) referred to the current defences for each policy unit, and assessed the likely habitat change that would result from its implementation. This was based on the Defence Assessment carried out to inform the SMP (NFDC 2010, Appendix C2), which set out details of the defences for each section of frontage across the SMP area.

4.3.9 The Appropriate Assessment findings indicate that ‘HTL’ policies will have potential impacts on mudflat and saltmarsh habitats through coastal squeeze processes and potential site-specific effects on coastal vegetated shingle and unvegetated shingle. HTL policies were not found to have likely significant effects on habitats located behind defences.

- 4.3.10 The Appropriate Assessment quantifies the extent of habitat losses anticipated as a result of implementing all SMP policies; Table 4.2 summarises the findings of the assessment in relation to estimated habitat loss within Solent and Southampton Water SPA / Ramsar over the next 100 years, which policies 5c10, 5c11 and 5c12 may contribute to.

Table 4.2: Habitat losses and gains in the Solent and Southampton Water SPA / Ramsar as a result of SMP policies (Source: NFDC, 2010, Appendix J, p.64)

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

- 4.3.11 The loss of saltmarsh habitat will be compensated through the Regional Habitat Creation Programme, which aims to provide strategic delivery of compensatory habitats as identified through the HRA of the SMP, as well as compensatory habitats required to offset coastal squeeze losses caused by the continued maintenance of existing third party defences (NFDC, 2010).

Southampton coastal flood and erosion risk management strategy

- 4.3.13 The Southampton Coastal Flood and Erosion Risk Management Strategy (URS, 2012), which covers a 22km stretch of the coast from Redbridge to Woodmill Lane, was completed in 2013. This provides detailed assessment of future flood risk management options for the implementation of North Solent SMP policy unit 5C12, Redbridge to Woodmill Lane.
- 4.3.14 An HRA was undertaken as part of the development of the strategy. Coastal squeeze was considered to be the principal impact arising from the strategy’s policies with the potential to affect designated intertidal habitats as well as bird species and salmon supported by these habitats. It was concluded that the preferred options will have no adverse effect on intertidal habitats and associated species, over and above those already identified and accounted for within the SMP, except for a potential local adverse effect on intertidal area at Redbridge beyond 2060. Project level HRAs will need to be completed where necessary to ensure no likely significant effects for individual schemes (URS, 2013).

River Itchen flood alleviation scheme

- 4.3.12 The River Itchen Flood Alleviation Scheme (SCC, No date) is responding to recommendations in the Southampton Coastal Flood and Erosion Risk Management Strategy. The Scheme focuses on reducing flood risk to hundreds of existing homes and businesses in Northam, St Marys, Chapel and parts of the city centre, through the implementation of a flood wall along on the west bank of the River Itchen from the Mount Pleasant Industrial Estate to the raised Southampton Water Activity Centre. Two options of flood defence infrastructure have been considered and were subject to consultation in 2015, although there were concerns raised regarding both the front line and set back options. At the beginning of 2019, SCC and the Environment Agency established a partnership to drive the scheme forward. The next step of the project is to secure funding proposals.

- 4.3.13 The potential impacts of any option taken forward will need to be considered as part of the HRA for the Southampton City Vision Local Plan.

4.4 Potential Impact of the Local Plan

- 4.4.1 The current HTL policy in the North Solent SMP will result in a loss of intertidal habitat, as described in section 4.3, although this loss will be compensated by the Regional Habitat Creation Programme. Development as part of the Southampton City Vision Local Plan which is in compliance with the HTL policy is therefore considered to be neutral in terms of effects to European sites from coastal squeeze. However, any development which necessitates a change to the HTL policy, such as land reclaiming, will increase impacts associated with coastal squeeze to European sites in the Solent. This includes the introduction of new defences or a coastal management strategy that involves advancing the line.

5 Noise and Vibration

5.1 Description of Impact

- 5.1.1 Noise and vibration impacts arising from construction activities, for example piling, as well as noise generating operational land-uses can alter the behaviour of both birds and fish, and result in avoidance of otherwise suitable habitats potentially creating a barrier to movement. The potential impacts of such disturbance to birds include increased energy costs associated with avoiding perceived predation risk, which reduces the proportion of time spent foraging / roosting. For fish, 'anthropogenic' noise sources can cause many different problems such as physical damage, physiological stress, and behavioural interruption (Slabbekoorn, 2012). The location, timing and construction methods for new developments are key determinants in the scale of potential impacts.

5.2 Sites Potentially Affected

- 5.2.1 Noise and vibration impacts could potentially affect qualifying bird species of the Solent and Southampton Water SPA/Ramsar, both within and outside designated areas, on the water, on the intertidal areas and along the shoreline. In addition, construction along the east of the Southampton coastline and along the Itchen Estuary and River Itchen (including Itchen waterfront and the River Itchen Flood Alleviation Scheme) has the potential to cause noise and vibration impacts on fish assemblages that support the Solent and Southampton Water SPA/Ramsar, migrating Atlantic salmon on their way to/from their spawning ground in the River Itchen SAC, and possibly otters *Lutra lutra* moving through their territory. Noise and vibration impacts are unlikely to affect the Solent and Dorset Coast pSPA. This site is designated to protect foraging habitats for terns; species which plunge-dive for fish, an activity which generally takes place away from shallow inshore waters.

River Itchen

- 5.2.2 The River Itchen is designated for several species of fish and the European otter, all of which will be more or less sensitive to noise and vibration through the water column, and in the case of the otter in close proximity to holts and other terrestrial habitat. This section establishes distances from the SAC over which construction projects could be likely to significantly affect qualifying species based on the species' sensitivity to noise and vibration.

Atlantic salmon

- 5.2.3 In addition to direct trauma, a significant risk associated with underwater noise generated by piling is the creation of an acoustic barrier to fish migration. Acoustic barriers/deterrents have the potential to impede fish as they migrate up and down the estuary. Any factor that limits the ability of fish to reach spawning grounds will potentially have a catastrophic effect on recruitment for a given species in that year and thus maintenance of the population.

- 5.2.4 The metric most commonly used for the assessment of the behavioural and audiological effects of noise on animals is that of 'decibels above the hearing threshold' or dBht. This is species-specific, requiring knowledge of the hearing threshold of the species in question, and has been most widely investigated for marine species. The Atlantic salmon has relatively poor hearing with peak sensitivity at 160Hz. For marine species, it is becoming accepted practice in the UK to consider that between 0-50dBht (Species) there is a low likelihood of disturbance. The Environment Agency criteria for acceptability of in-water levels for Atlantic salmon requires that not more than 50% of the cross sectional area of a watercourse should be exposed to noise levels greater than 50dBht (*Salmo salar*) (i.e. 50 decibels above the hearing threshold of the Atlantic salmon) to ensure that continued use of the watercourse by migrating salmon is possible (AECOM, 2015).
- 5.2.5 Postlethwaite (2010) suggested that noise levels may exceed the 50dBht (*Salmo salar*) threshold for some construction activities (e.g. piling operations) taking place up to 20m (in the case of vibropiling) or up to 70m (in the case of impact piling) from the edge of the watercourse. Given the relatively narrow width of the River Itchen in some locations, it is possible that vibration within the river will travel the full width. The Environment Agency has also expressed concerns over the potential risks to incubating salmon eggs from vibration; if the likelihood of the presence of salmon eggs and vibration were both high, then timing of the works would need to be restricted. However, such risks are unlikely to occur in the Itchen within Southampton as spawning grounds are located further upstream.

Otter

- 5.2.6 Otters have very acute high frequency hearing sensitivity (16kHz) but much poorer hearing sensitivity than humans at frequencies below 4kHz; this may explain why they appear to tolerate what, to humans, are perceived as 'noisy' environments. Chanin (2003) stated that otters will rest under roads, in industrial buildings, close to quarries and at other sites close to high levels of human activity. These observations indicate that otters are very flexible in their use of resting sites and do not necessarily avoid disturbance in terms of noise or proximity to human activity. However, activities close to either the River Itchen SAC itself or to habitats upstream or downstream that may be used by otters as corridors or links to the neighbouring catchments could constrain their distribution and dispersal.
- 5.2.7 Postlethwaite (2010) suggested that a sound pressure level below 50dBht (*Lutra lutra*) would probably result in a low likelihood of disturbance for otters as it does for humans and many marine species. The report further identifies that most construction activities involving ground penetration or noise would not result in disturbance (i.e. noise levels above 50dBht (*Lutra lutra*)) if undertaken over 30m from the watercourse but that some activities (e.g. piling) may disturb up to 80m away. The zone of influence of construction noise on potential otter disturbance could even extend to 100m from individual construction tasks if these are of a highly percussive nature (e.g. driven/impact piling). To be precautionary for the purposes of this HRA any development site which could involve piling within 100m of the River Itchen SAC or tributaries known/likely to be used by otters is screened in for the devising of site-specific measures at the planning application stage.

Impact mechanisms: Solent & Southampton Water

- 5.2.8 Development whose construction processes emit a level of noise which could change the distribution of qualifying species within a European site or important supporting area, displacing the species from otherwise suitable habitats, could thereby reduce individual survival rates and risk a population reduction. This could be due to the proximity of the development site to the European site / supporting area, or the absence of existing topographic features, structures or vegetation which may serve to sufficiently attenuate the noise, or a combination of both.
- 5.2.9 Very loud (defined as greater than 70dB) and percussive noises have the potential to disturb birds, increasing time spent alert and in flight, and reducing the time available to feed. Peak levels of sound are most likely to occur from the impact of pneumatic drilling and concrete breaking during site preparation and piling during construction. These activities can have an impact on bird species at a distance of up to 300m. This figure has been used as a worst-case scenario and is based on published research and studies by the Environment Agency for the Humber Estuary Tidal Defences scheme, the Environmental Statement for which states that: "Sudden noise in the region of 80dB appears to elicit a flight response in waders to 250m from the source, with levels below this to approximately 70dB causing flight or anxiety behaviour in some species." Natural England normally advises that construction noise should be kept below 69dbAmax (at the sensitive receptor i.e. SPA or supporting habitat) during the bird overwintering period (October-March), or construction should be timed to occur outside of the wintering period.

5.3 Extent of Impact at Present

- 5.3.1 Noise and vibration impacts are not recorded on Natura 2000 Data Forms or Natural England's Supplementary Advice as existing concerns in relation to the sites that could be affected by Local Plan development (River Itchen SAC (Natural England, 2019b) or the Solent and Southampton Water SPA/ Ramsar (Natural England, 2019c)).

5.4 Potential Impact of the Local Plan

- 5.4.1 Despite Natural England not listing noise and vibration impacts as existing concerns in relation to the River Itchen SAC and the Solent and Southampton Water SPA/Ramsar, at the site level, there is potential for impacts during both construction and operation, and in combination with other existing uses and construction projects in the City. This needs to be considered during allocation site selection for the Southampton City Vision Local Plan. The issue may necessitate policy wording to ensure that project-level HRA considers noise and vibration impacts and the potential need for site-level avoidance measures to be applied during construction and operation, as required. These impacts are most likely in strategic development areas, including the City centre, along the River Itchen, particularly along the western bank.

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6 Recreational Disturbance

6.1 Description of Impact

- 6.1.1 Population growth associated with residential development brings with it the prospect of additional visitor pressure on European sites. There is particular concern over the capacity of existing open spaces adjacent to or within European sites to accommodate additional visitor pressure resulting from planned residential development, and development and promotion of tourism (particularly along the coast), without adverse effects on European site integrity, particularly those designated for an internationally important bird assemblage.
- 6.1.2 Impacts associated with disturbance from recreation differ between seasons, species, and individuals. Birds' responses to disturbance can be observed as behavioural or physiological, with possible effects on feeding, breeding and taking flight. Murison *et al.* (2007) noted that birds often react to human disturbance as a form of predation risk. Such a response can include elevated heart rate, heightened defensive behaviour, including evasive measures, and the avoidance of high risk areas (Murison *et al.* (2007), Liley & Sutherland (2007)). High levels of human activity in important nature conservation areas might then change the behaviour of animals to such a degree that conservation priorities become compromised. This may result from reduced breeding success, increased energetic expenditure, predation, or exposure of nests, eggs or young to trampling and the elements (Liley & Sutherland, 2007).
- 6.1.3 Disturbance can be caused by a wide variety of activities and, generally, both distance from the source of disturbance and the scale of the event will influence the nature of the response. Factors such as habitat, food requirements, breeding behaviour, cold weather, variations in food availability and flock size, will influence birds' abilities to respond to disturbance and hence the scale of the impact (Stillman *et al.*, 2009). On the other hand, birds can modify their behaviour to compensate for disturbance, for example by feeding for longer time periods. Some birds can become habituated to particular disturbance events or types of disturbance, and this habituation can develop over short time periods (Stillman *et al.*, 2009).
- 6.1.4 In the New Forest, it is the ground and near-ground nesting birds that are particular receptors of negative effects, such as Dartford warbler *Sylvia undata*, nightjar *Caprimulgus europaeus* and woodlark *Lullula arborea*. Studies by Langston *et al.* (2007), Liley and Clarke (2003), and Murison (2002) investigated the effect of disturbance on the 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. 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 (e.g., close to access points and car parks) delayed the start of their breeding by up to six weeks, preventing multiple broods and so reducing annual

productivity. Most of this disturbance was found to come from dog-walkers as a result of dogs being encouraged to run through the vegetation after sticks.

- 6.1.5 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. Disturbance effects are not the only impacts of visitor pressure. Others include: arson and wild fires, litter, predation from people and pets, fly-tipping, trampling and soil compaction, and site management problems, each of which could have indirect effects on SPA qualifying features.
- 6.1.6 In coastal areas it can be helpful to divide impacts into the effects of disturbance on overwintering birds, or on breeding birds. Impacts to wintering birds are centred on interruption to foraging or roosting. Individuals alter their threshold in response to shifts in the basic trade-off between increased perceived predation risk (tolerating disturbance) and the increased starvation risk of not feeding or increased energetic expenditure (avoiding disturbance) (Stillman *et al.*, 2009). During the breeding season, impacts on shorebirds arise from increased predation of eggs, as well as trampling and increased thermal stress, when birds flush the nest in response to a disturbance event, leading to reduced breeding success (Stillman *et al.*, 2009).

6.2 Sites Potentially Affected

Solent SPAs

- 6.2.1 The Solent Disturbance and Mitigation Project was initiated by the Solent Forum in response to concerns about the impact of recreational disturbance on birds within the protected areas of the Solent. The Solent provides locations for a wide range of recreational activities and the project shows that there are high levels of housing around the Solent shoreline, with particularly high densities in the urban areas of Southampton and Portsmouth. The project was divided into three phases:
- ▶ Phase I collated and reviewed information on housing, human activities and birds around the Solent, and reviewed the potential impact of disturbance on birds.
 - ▶ Phase II involved a programme of major new data collection to (i) estimate visitor rates to the coast from current and future housing, (ii) measure the activities and distances moved by people on the shore and intertidal habitats, (iii) measure the distances and time for which different bird species respond to different activities, and (iv) model the impacts of future housing growth on over-winter survival rates of bird species.
 - ▶ Phase III resulted in an Avoidance and Mitigation Plan.
- 6.2.2 The researched showed that an estimated 52 million visits are made by households to the Solent coast each year, of which just over half are made by car. The majority of visitors make trips to the coast specifically to see the sea and enjoy the coastal scenery. Dog walking was the most frequently observed activity, with walking, cycling and jogging being other common

recreational activities. Most activities involved people staying on the shore/sea wall rather than being on the intertidal areas or in the water. Human activity that took place on the intertidal areas was more likely to result in bird disturbance; on those areas dog walking was particularly common and resulted in a disproportionate amount of the observed bird disturbance.

- 6.2.3 The Phase III report identifies a 5.6km buffer as the zone of influence within which the majority of coastal visitors live, and hence where the majority of the impact of new development would originate. The whole of Southampton lies within this 5.6km zone (Figure 6.1) and therefore it is considered that any development within Southampton has the potential to contribute to recreational disturbance within the Solent and Southampton Water SPA / Ramsar. Portsmouth Harbour SPA / Ramsar and Chichester and Langstone Harbours SPA / Ramsar are located more than 5.6km from the Southampton City boundary and therefore development in the City is less likely to contribute to recreational disturbance at these sites; the Phase III mitigation strategy addresses these sites as well so any potential for in combination effects would be adequately addressed by the strategy. Foraging terns within the Solent and Dorset Coast pSPA are unlikely to be affected by recreational activities on the seafront and foreshore and hence this site is screened out from further consideration under this impact pathway.

New Forest SPA

- 6.2.4 Forty percent (40%) of New Forest visitors are staying tourists, a further 25% are day-trippers, coming from beyond 5 miles, and locals (living within 5 miles) account for 35% of visitors. Of the day-trippers 52% come from Hampshire, specifically 28% from Southampton, Eastleigh and Chandlers Ford. Most day visitors and a large proportion of the total number of visitors come from within 20 km of the National Park boundary (Sharp *et al*, 2008). It is therefore considered that development within Southampton could also contribute to recreational disturbance within the New Forest SPA.

Southampton City Vision Local Plan

- Solent and Southampton Water SPA / Ramsar
- Solent PSA Mitigation Buffer (5.6km)
- City Boundary
- Wards

Figure 6.1: 5.6km Recreational Buffer Zone for European Protected Sites

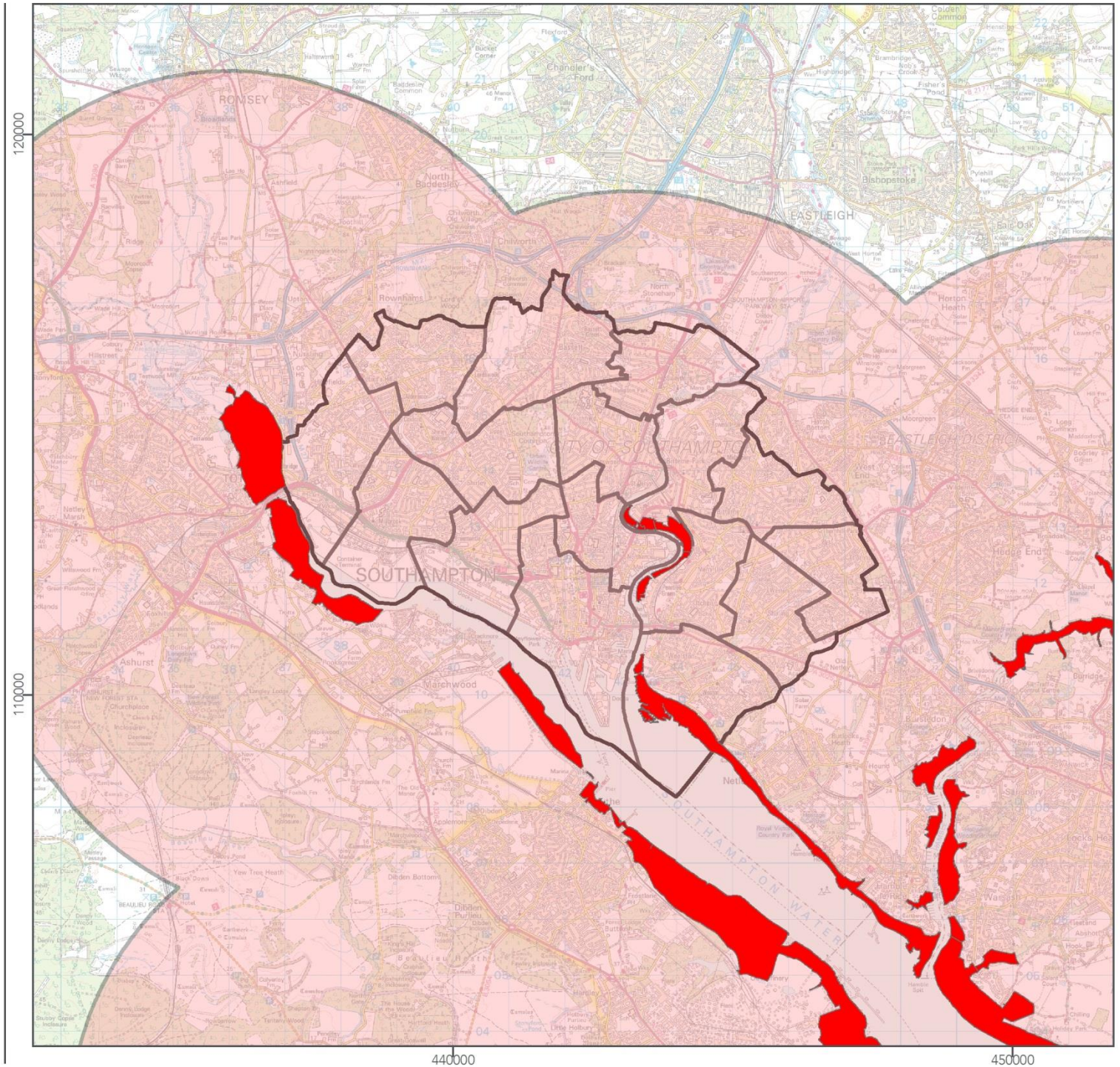


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6.3 Extent of Impact at Present and Potential Impact of the Local Plan

Solent SPAs

- 6.3.1 Phase II of the Solent Disturbance and Mitigation Project involved the creation of a model to predict whether disturbance from current and future amounts of human activity may be reducing the survival of birds. Models of Southampton Water and Chichester Harbour were prepared, within which the relationship between a number of factors was examined: intertidal invertebrate food supply, the exposure and re-covering of this food during the tidal cycle, disturbance from human activities, and the energy requirements and behaviour of birds as they avoid human activity and search for food. For Southampton Water three versions of the model were developed which differed in the amount of the site within which individual birds were able to move. The three sub-site model, where the site was divided into southern, mid and northern sub-sites based on the observations of bird movements, was considered to most accurately represent the real system and was used as the basis for predictions.
- 6.3.2 In the absence of disturbance all wader species modelled in the Southampton Water model were predicted to have 100% survival through the winter. Dunlin *Calidris alpina*, Ringed Plover *Charadrius hiaticula*, Oystercatcher *Haematopus ostralegus* and Curlew *Numenius* were predicted to be the species most vulnerable to disturbance due to their combination of disturbance distances, night-time feeding efficiency and vulnerability to food competition at high competitor densities, with survival rates reduced to approximately 88%, 89%, 95% and 94% respectively. The predicted reduction in survival for Dunlin, Ringed Plover was further reduced in the 'future housing' scenario to 85% and 84% respectively.
- 6.3.3 Additional scenarios were run inside the Southampton Water model to explore hypothetical situations regarding the available area of intertidal habitats (e.g. to account for sea level rise), variations in the energy requirements of the birds (such as might be the case during cold winters or particularly high energy expenditure while avoiding disturbance). The survival rates of Dunlin, Ringer Plover, Oystercatcher and Curlew were predicted to decrease when intertidal habitat area was reduced or energy requirements were increased. Conversely, if intertidal activities were moved to the shore, so reducing the area of intertidal that was subject to disturbance, wader survival rates increased.
- 6.3.4 The results for Southampton Water were assessed for suitability in scaling up to predictions of survival rates elsewhere in the Solent. The study determined that wader survival was predicted to decrease in Southampton Water when daily visitor rates to coastal sections were greater than 30 per hectare of intertidal habitat. Future visitor densities at other sections of Solent coastline were calculated and compared to this critical density of 30 daily visits per hectare of intertidal habitat.
- 6.3.5 There are several other sections of the Solent coastline where this threshold is predicted to be breached under the future housing scenario, and therefore where bird survival may be being reduced as a result of disturbance, including several where visitor densities are predicted to be

several hundred daily visitors per hectare of intertidal habitat (visits/day/ha). Sections close to Southampton predicted to breach 30 visits/day/ha in future are:

- ▶ 19 Freemantle to Ocean Village: 391.9 visits/day/ha – this section is not immediately adjacent to European-protected areas;
- ▶ 22 Northam Bridge to St. Denys: 38.1 visits/day/ha;
- ▶ 23 St. Denys - Cobden Bridge to Swaythling: 298.3 visits/day/ha; and
- ▶ 24 Weston to Netley: 63.9 visits/day/ha.

6.3.6 In conclusion, the model provides some evidence for the hypothesis that survival rates among some species of waders are being negatively influenced by disturbance, particularly when visitor densities are greater than 30 visitors per hectare of intertidal per day, and that visitor numbers are expected to increase (and survival rates to further decrease) as a result of future housing development. However, it may be that residents in some parts of Southampton, the city centre for example, would have comparatively lower impacts than residents in other areas. For example, within the City Centre, around 40% of City Centre residents are students and there is a high proportion of flatted accommodation (80% in Bargate Ward). Consequently levels of dog ownership, which is an important factor in the scale of disturbance impacts, are likely to be relatively low.

6.3.7 It is also relevant to note that Southampton has lower levels of car ownership than the south east region or England according to Census data (ONS, 2011) with 70.5% of households having access to a car or van compared to 85.3% for Hampshire, 81.4% for the South East and 74.2% for England. This may therefore suggest that many Southampton residents would use nearby areas of open space as their main recreational resource. Together with the findings of the SDMP, this may suggest a lower contribution to recreational pressure on sites (since the nearest survey site in the Solent had zero visitors from Southampton).

Dark-bellied Brent Goose

6.3.8 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 eelgrass beds, and terrestrial pasture, arable, grassland and saltmarsh habitats are all important food sources.

6.3.9 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). The best sites are likely to be those where a high proportion of the site is greater than the response distance away from sources of disturbance such as visitor access routes. 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).

New Forest SPA

- 6.3.10 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. The report shows that most day visitors to the Forest, and a large proportion of total visitors, come from within 20km of the National Park boundary, while between 78% and 95% of visits are made by car.
- 6.3.11 Sharp *et al.*, (2008) estimate that around three quarters (764,000) of this annual total increase will originate from within the first 10km from the Forest, which includes Southampton. Separating distances into individual 1km bands, between 50,000 and 95,000 additional visitors will originate from within each of the bands 2 to 7km from the Forest in any direction, including Southampton and any other location within that distance from the SPA boundary. See for example Figure 6.2 which depicts the estimated population density within each distance band by 2026. New residential development promoted by the Local Plan will therefore fall within the sphere of highest potential influence on the New Forest, albeit on the outer edge of that zone.
- 6.3.12 Sharp *et al.*, (2008) reported that 16% of the New Forest SSSI was classified as unfavourable no change or unfavourable declining at that time. Recreational pressure or disturbance was cited as a reason for unfavourable condition for 4 units (unit numbers 54, 249, 496 and 571, totalling some 98ha). The current (2019) condition of New Forest constituent SSSI is listed in Table 2.1; Natural England now cite recreational pressure or disturbance just for units 249 and 571 units⁵. Improvements in SSSI condition have increased in recent years as a result of large scale habitat restoration work, and further improvements are likely in forthcoming years. Survey figures from 2014 indicate that numbers for the majority of bird species in the New Forest seem to have remained relatively stable in recent years, despite some fluctuations. However the recent figures for redshank *Tringa totanus*, woodlark and Dartford warbler appear to indicate an overall decline, see Table 6.1.

⁵ Natural England (2019): <https://designatedsites.naturalengland.org.uk/>. Accessed online [02/10/19]

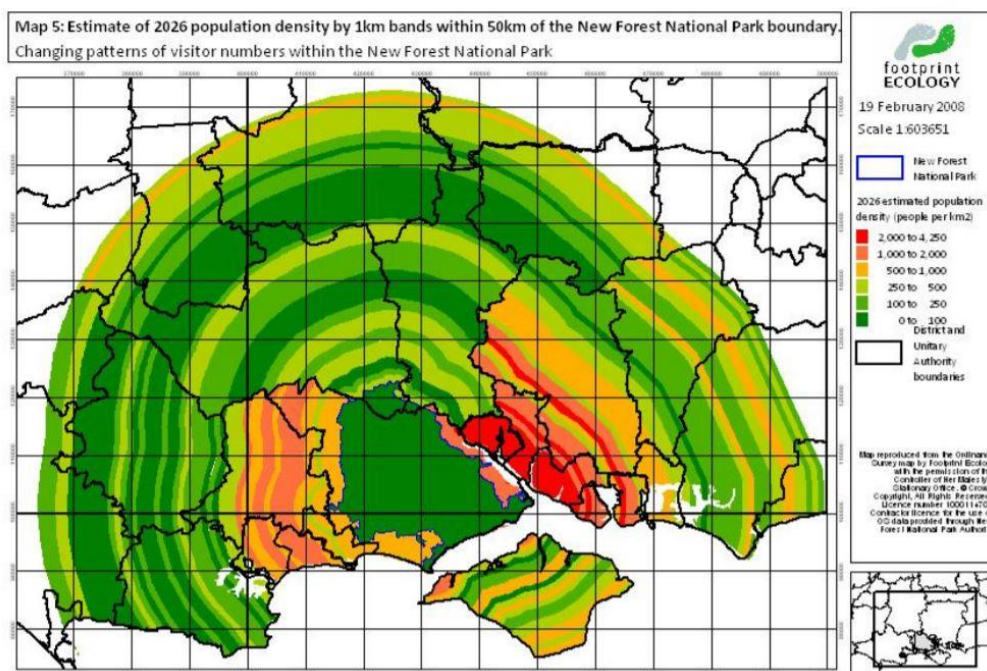


Figure 6.2: Estimate of 2026 Population Density by 1km bands within 50km of the New Forest National Park Boundary (Source: Sharp et al., 2008)

Table 6.1: Current and Historical Estimates of Ground Nesting Bird Populations (Source: NFNP, 2019)

	Estimated Numbers of Breeding Pairs / Territories					
Lapwing	1981	1993	1994	2004	2014	2019
	250-450	190	84-87	117	144	68
Redshank	1981	1993	1994	2004	2014	2019
	105-140	69	54-57	42	13	7
Curlew	1981	1993	1994	2004	2014	2019
	120	96	132	99	123	40
Snipe	1981	1993	1994	2004	2014	
	120-200	87	156	111	102	
Nightjar	1981	1992		2004/5	2013	
	78	313		629	544	
Woodlark	1986		1997	2006	2014	2019
	36		182	143	134	169
Dartford Warbler	1984		1994	2006	2014	2019
	187		535	420	268	143

7 Site-Specific Allocations

7.1 Description of Impact

7.1.1 This pathway is defined as impacts from development which, due to its location and size (i.e. footprint), changes the extent or distribution of a qualifying habitat or the habitats of qualifying species within a European site, thereby reducing the population or restricting the distribution of qualifying species. It also includes development which would result in the loss of habitats outside of a European site which support the its ecological functions , such as sites regularly used by waders or dark-bellied Brent goose *Branta bernicla bernicla* for feeding or roosting at high tide.

7.2 Sites Potentially Affected

7.2.1 Whereas the Solent Recreation Mitigation Partnership seeks to manage impacts to overwintering birds within the SPA/Ramsars, the Solent Waders and Brent Goose Strategy (Whitfield, 2019) aims to avoid impacts to qualifying species using land outside of the designated sites (in Southampton's case, the Solent and Southampton Water SPA/Ramsar) which have a functional 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.

7.3 Extent of Impact at Present

7.3.1 Dark-bellied Brent goose feeds mainly on beds of eelgrass and other vegetation in the intertidal zone. At high tide, and especially later in the season when intertidal vegetation has either died-back or become depleted through grazing, the birds make use of grasslands and arable fields within 5km of roost areas (Stroud *et al.*, 2016) to supplement their diet. In the south Hampshire area the availability of alternative feeding sites for Brent geese are at a premium due to a heavily urbanised landscape, while sites close to the coast which remain undeveloped are often subject to high visitor pressure, especially amenity grasslands, parkland and playing fields.

7.3.2 The Solent's intertidal habitats, its mudflats, shingle and saltmarsh provide vital feeding and roosting grounds for wading birds. Waders are adapted to feeding in wetlands, adopting a variety of tactics to feed on invertebrates such as worms and molluscs, and in some cases fish that occupy the mudflats of estuarine areas. The pattern of movement of wading bird communities is dependent on time of day, tidal water movements and weather conditions. Most species feed at low tide and roost at high tide. Natural roosting sites include saltmarsh areas, shingle banks and coastal grasslands but waders are also known to roost on built structures such as boats, wharfs, jetties and piers. Roosting sites tend to be close to the coast,

often within 100m from mean high water, have good visibility and are usually situated away from sources of disturbance, such as housing and industry (King, 2010).

- 7.3.3 The Solent Waders and Brent Goose Strategy aims to protect the network of non-designated terrestrial wader and Brent goose sites that support the SPA. It classifies sites as Core Areas, Primary Support Areas, Secondary Support Areas, Low Use sites and Candidate sites. A framework for guidance on mitigation and off-setting requirements for each classification is proposed to achieve the long-term protection of the wider Brent goose and wader network of sites. There is one Core area with Southampton, located at Weston Hard, as well as four Primary support areas and six Secondary support areas; see **Error! Reference source not found.**

7.4 Potential Impact of the Local Plan

- 7.4.1 The Southampton City Vision Local Plan could have a negative effect on Brent Geese and Waders overwintering in the Solent due to development in the coastal zone resulting in losses of areas of functionally connected land used by the species for feeding or roosting at high tide. Loss of functionally connected land to development of any kind could, unless mitigated, reduce the overall extent of habitats which support the Brent goose and wader populations within the SPA/Ramsar. Residential development may be of greater concern where it is of a scale or location which could increase disturbance to adjacent areas of supporting habitat, thereby reducing the suitability of land left undeveloped as well.
- 7.4.2 A number of sites have been identified in Southampton as shown on Figure 7.1 and Figure 7.2. These are primarily located on the River Itchen and comprise of inter-tidal mudflats, jetties and pontoons. Roosts have also been identified along Weston Shore and the derelict Royal Pier.

Southampton City Vision Local Plan

-  Core Area
-  Low use
-  Primary Support Area
-  Secondary Support Area
-  SPA site
-  City Boundary
-  Wards

Figure 7.1: Brent Goose and Wader Sites in and around Southampton

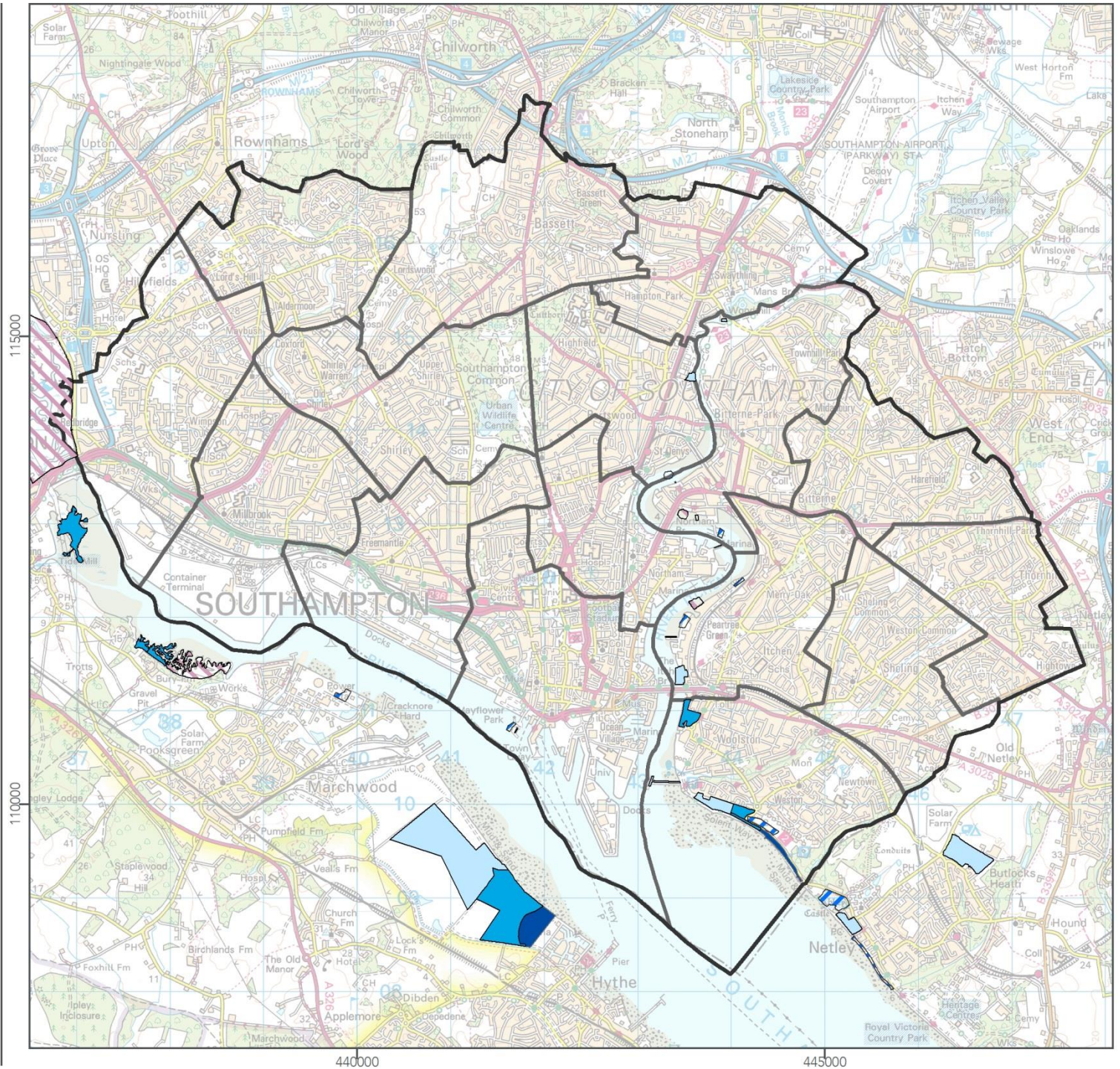


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Southampton City Vision Local Plan







-  Low use
-  Primary Support Area
-  Secondary Support Area
-  SPA site
-  City Boundary
-  Wards

Figure 7.2: Brent Goose and Wader Sites along the River Itchen



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Scale: 1:16,000 **Created by:** MW
Date: Oct 2019 **Reviewed by:** GC
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 UE0338SEA_Solent_BGW(Itchen)_191016



8 Tall Buildings and Collision Risk

8.1 Description of Impact

- 8.1.1 Tall buildings and other structures can result in disorientation and collision risk to birds in areas close to designated or supporting habitats, which can be exacerbated by lighting and glazed windows. They can also interfere with the normal commuting or migration routes of birds. The role of tall buildings and other structures, their design and location in relation to the various sites used by birds will be an important factor in the degree of disorientation and collision risk presented. The issue is likely to be both highly spatially specific and weather dependant, and to be affected by the relative locations of bird roosts, foraging habitats and proposed new development.
- 8.1.2 There has been extensive research in North America concerning bird collisions with buildings. Bird collisions with buildings (and automobiles) are the second largest cause of anthropogenic direct mortality to birds behind predation by cats in the United States (Loss *et al.*, 2015). The most recent national estimate of mortality from building collisions is 365–988 million birds killed annually in the United States corresponding to an annual decrease of between 11% and 31% in the avian population (Loss *et al.*, 2014). Research suggests that mortality is disproportionate across species. Findings from Nichols *et al.*, 2018 suggest that for many species, abundance and timing of migration are the predominant determining factors for collision risk, but that for 20% of species, the species, genus, and family of a bird may affect the collision risk.

8.2 Sites Potentially Affected

- 8.2.1 Collision risk could potentially affect qualifying bird species of the Solent and Southampton Water SPA/Ramsar and the Solent and Dorset Coast pSPA, both within and outside designated areas along the shoreline. The Itchen waterfront is a significant focus for redevelopment, particularly for employment uses, including the River Itchen Flood Alleviation Scheme and therefore there is potential for collision in this area to impact on SPA/Ramsar qualifying species.

8.3 Extent of Impact at Present

- 8.3.1 There have been limited studies on the incidence of building strikes in the UK and Southampton and it is not known to what extent qualifying species of the Solent and Southampton Water SPA/Ramsar are currently being affected by collisions with buildings and other structures. However, in response to the risk of bird collisions with tall buildings raised by the HRA of the Core Strategy, SCC commissioned the Southampton Wetland Bird Flight Paths Study (GeoData Institute, 2009).

Southampton Wetland Bird Flight Paths Study

8.3.2 The study carried out surveys and analysis to gain a better understanding of wetland bird flight paths around the City and the potential for bird collisions with tall buildings. A series of surveys were conducted between December 2008 and March 2009 in three main survey areas around the city: River Test, River Itchen and the City Centre Action Plan area, to track the movements of species comprising the bird assemblage, as listed below:

- ▶ Gadwall *Anas strepera* (Not observed)
- ▶ Teal *Anas crecca*
- ▶ Ringed Plover
- ▶ Black-tailed Godwit *Limosa limosa islandica*
- ▶ Little Grebe *Tachybaptus ruficollis*
- ▶ Great Crested Grebe *Podiceps cristatus*
- ▶ Cormorant *Phalacrocorax carbo*
- ▶ Dark-bellied Brent Goose *Branta bernicla*
- ▶ Wigeon *Mareca penelope*
- ▶ Redshank
- ▶ Pintail *Anas acuta* (Not observed)
- ▶ Shoveler *Anas clypeata* (Not observed)
- ▶ Red-breasted Merganser *Mergus serrator*
- ▶ Grey Plover *Pluvialis squatarola*
- ▶ Lapwing *Vanellus vanellus*
- ▶ Dunlin
- ▶ Curlew
- ▶ Shelduck *Tadorna ferruginea*

- 8.3.3 The survey captured information on a number of 'bird movement attributes', including density of waterfowl movements along observed flight paths, direction of movements and flying heights. A separate 'Gull Survey' was also carried out (using a different methodology in view of the large numbers observed), which captured flight path data in relation to the Mediterranean Gull, which is an Annex I qualifying species of the Solent and Southampton Water SPA. It also surveyed several other gull species of national importance.

Study results

- 8.3.4 Movements of waterfowl were found to be primarily focused on the estuarine river corridors, with movements overwhelmingly directed up and down the rivers, generally representing reciprocal movements associated with diurnal variations in the tides. Flight paths over the city centre were limited, although there were some flight lines close to the area. Most (90%) of the birds were flying within the building height band. A further analysis of this data showed that 16% of birds were flying within the building height zone along flight lines which intersected building footprints: 32% were within 50m of a building, 55% within 100m, 65% within 200 and 99.9% within 500m.
- 8.3.5 The study report illustrates its findings in a series of maps for each measured attribute, and with specific results reported for individual species that were observed in sufficient numbers to enable an analysis. The map reproduced in Figure 8.1 provides a 3D plot showing the relative density of waterfowl movements in relation to buildings within the City centre.

8.4 Potential Impact of the Local Plan

- 8.4.1 The construction of new tall buildings in proximity to Solent and Southampton Water SPA/Ramsar and existing flight corridors could impact on qualifying bird species as a result of collision mortality.

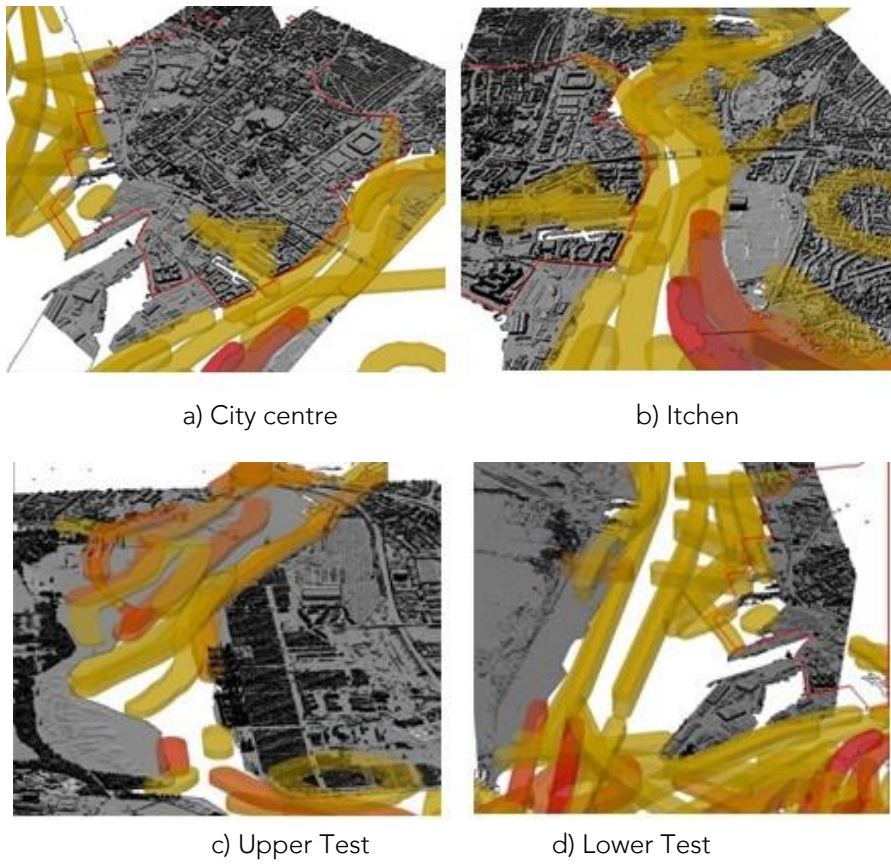


Figure 8.1: Waterfowl Assemblage - Birds in Building Height Zone (Source: GeoData Institute, 2009)

9 Water Demand

9.1 Description of Impact

- 9.1.1 New homes require the development of new infrastructure, including the provision of fresh water supply. Water quantity plays a critical role in the health and biodiversity of river catchments, including water levels (depth and volumetric flow) and velocity in the river, and water table levels in the floodplain. These properties in turn influence rates of siltation and erosion, dissolved oxygen, and pollutant and nutrient concentrations. Low flow rates affect food availability, may limit migration and dispersal, and can alter the structure, composition and condition of vegetation communities.
- 9.1.2 Water supply in Southampton is provided by Southern Water's Southampton East and Southampton West Water Resource Zones (WRZ), which draw surface water from abstractions at Testwood on the River Test and Otterbourne on the Itchen, and groundwater from the Chalk aquifer at a ratio of approximately 52% surface water to 48% groundwater for Southampton East, and 100% surface water for Southampton West (Southern Water, 2019). However, abstractions from these systems alter the surface water regime, in turn impacting on important ecological receptors including the qualifying Annex 1 habitat and Annex 2 species within the River Itchen SAC.

9.2 Sites Potentially Affected

- 9.2.1 The residential element of proposed growth under the Local Plan is likely to be the main driver of increased water consumption. Additional pressure for water abstraction could result in adverse effects on the ecological integrity of the River Itchen SAC both via direct abstractions from the river and indirectly through groundwater abstractions.

9.3 Extent of Impact at Present

- 9.3.1 There are concerns about the quantity of water flow in the River Itchen and resulting impacts to the SAC which supports an abundant and exceptionally species rich aquatic flora. Changes to abstraction licences are required by the Environment Agency (see section 9.4) to remove the risk of adverse effect on the integrity of the SAC and remove the risk of serious damage to the River Test SSSI (Amec Foster Wheeler, 2018).
- 9.3.2 The Environment Agency's Review of Consents (RoC) under the Habitats Directive, completed in late 2007, determined sustainable levels of water abstraction 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 RoC process found that it was necessary to modify nine abstraction licenses in order to maintain minimum flows required to support

populations of designated species in the river, thereby ensuring the integrity of the River Itchen SAC.

9.4 Potential Impact of the Local Plan

River Itchen enquiry

9.4.1 Following publication of its Water Resources Management Plan (WRMP) 2014, Southern Water appealed against abstraction licence changes proposed by the Environment Agency. The changes were proposed in order to avoid ecological damage within the River Test and Itchen but Southern Water was concerned that the changes would limit its ability to undertake its statutory duties with respect to water supply particularly in periods of drought.

9.4.2 Southern Water and the Agency have since come to an agreement under Section 20 of the Water Resources Act 1991 (hereafter referred to as the 'River Itchen Agreement') (HWA, 2019) about the approach that should be taken to enable Southern Water to abstract greater quantities of water from the River Test, the Candover boreholes and the River Itchen than would be authorised under the Agency's proposed licence changes during drought conditions and force majeure scenarios. The Agreement includes:

- ▶ Acceptance of the Environment Agency's proposed Itchen licence changes, including abstraction during drought conditions to be authorised by a Drought Permit or Drought Order;
- ▶ Agreement of the ecological monitoring, mitigation and compensation measures that need to be in place in order to authorise a Drought Order/Permit on the Test, Itchen and Candover;
- ▶ Agreement of the process by which Southern Water will apply for Drought Orders/Permits authorising relief from licence conditions to abstract from the Test, Candover and Itchen during drought conditions (below 198ML/d for the Itchen and below 265 ML/d for the Test); and
- ▶ Agreement of the process to be followed in the event of a force majeure event for the Test.

9.4.3 The agreement signed in March 2018 will enable sustainability reductions to protect the River Itchen SAC to be implemented while ensuring that Southern Water can meet its statutory duties.

Southern Water WRMP 2019

9.4.4 Southern Water has forecast baseline demand and supply for the period 2020 to 2070 in their draft WRMP 2019 (Southern Water, 2019). The supply demand balance calculations consider *"the difference between total water available for use (as supply) and forecast distribution input (as water demand) at any given point in time over the Water Resource Management Plan's planning period/horizon"* (Southern Water, 2019). The demand calculations take account of population growth and changes in household composition based on housing projections by local authorities in the supply area.

- 9.4.5 For the Western area, which includes Southampton East WRZ and Southampton West WRZ, despite expecting a reduction in the demand for water, the introduction of sustainability reductions in 2017 on the River Itchen and the River Test, and a further known reduction on the Test in 2027, will result in a significant supply demand deficit throughout the planning period during a 1 in 200 year drought event as shown in Figure 9.1, where the “0” line across the centre of the graph represents a balance between supply and demand; where the coloured bands go below this line new demand management or resource development schemes need to be implemented to restore the supply demand balance.
- 9.4.6 The draft WRMP indicates that the company will have insufficient supplies of water available in the Western areas to supply our customers in all but normal environmental conditions. As soon as conditions start to become drier than normal, in the short term, Southern Water indicate that they will have to impose temporary use bans (hosepipe bans) and apply for Drought Orders to allow them to continue to abstract water below the conditions imposed in the new River Itchen and River Test licences. This position will only change when new supplies have been developed.

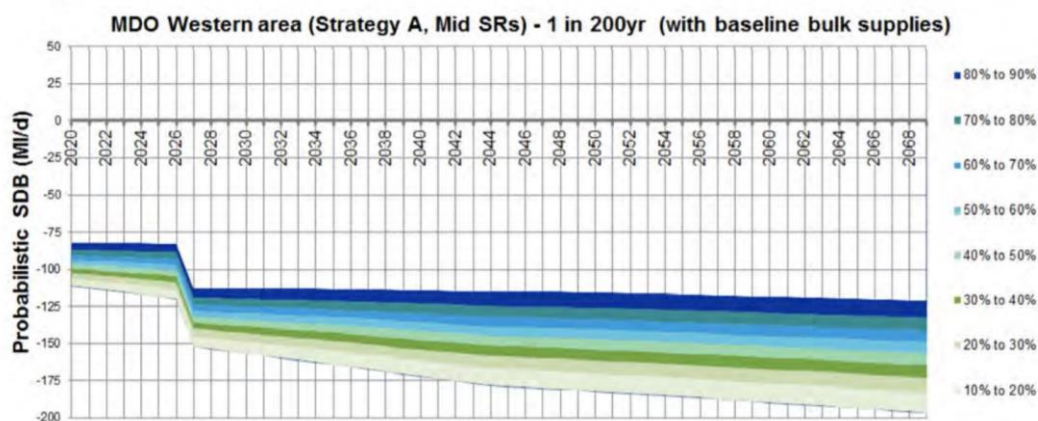


Figure 9.1: Supply Demand Balance in Western Area at the ‘Severe Drought’ Level 2020-2017 (Southern Water, 2019)

- 9.4.7 The company’s proposed strategy to resolve this deficit and develop new supplies, assuming full implementation of the Environment Agency’s licence changes for the Itchen and the Test is set out in Figure 9.2. This corresponds to Strategy A within the 2019 WRMP, which has been agreed with the Environment Agency as part of the River Itchen Agreement. At this stage, the proposals are still in draft and will be finalised within the final WRMP.
- 9.4.8 Strategy A has been subject to HRA which conclude that none of the options included will lead to significant adverse effects on any European sites. In the short term (to 2027), Southern Water will potentially need to make use of the Lower Itchen sources Drought Order in a severe drought (1 in 160 year drought event or worse) which may have adverse effects on the River Itchen SAC in the lowest reaches of the river. All other Drought Orders or Permits that may be required have been assessed as not having an adverse effect on European sites.

Figure 77: Diagrammatic Representation of Western area Strategy A

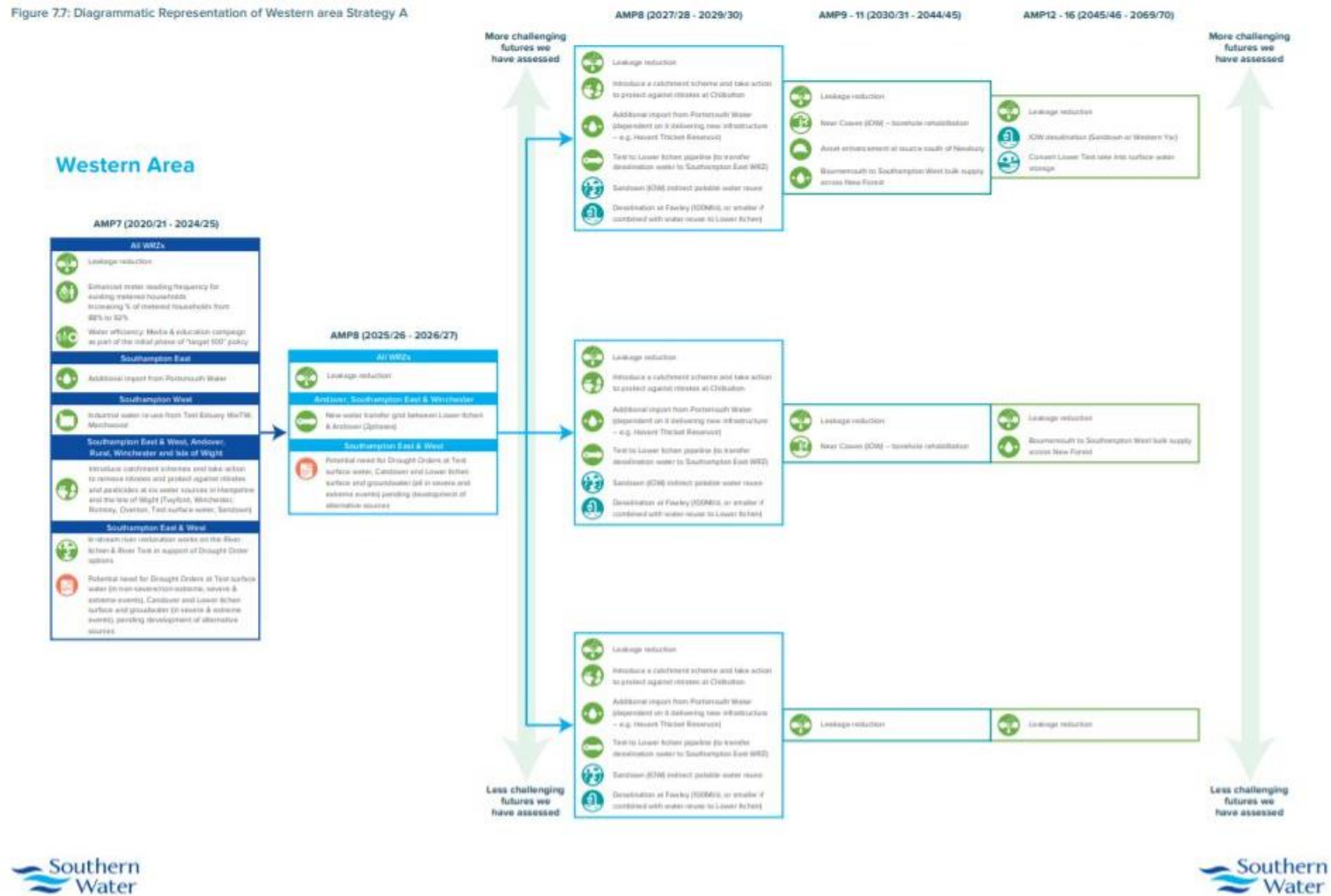


Figure 9.2: Western Area Strategy A to Resolve Supply Demand Deficit

10 Water Quality

10.1 Description of Impact

10.1.1 Water quality is an important determinant of habitat condition and the species a habitat supports. Poor water quality can have a range of environmental impacts; at high levels, toxic chemicals and metals can result in immediate death of aquatic life, and can have detrimental effects even at lower levels, including increased vulnerability to disease and changes in wildlife behaviour. Eutrophication (the enrichment of plant nutrients in water) increases plant growth and consequently results in oxygen depletion. Algal blooms, which commonly result from eutrophication, increase turbidity and decrease light penetration. Waste water treatment discharges, combined with diffuse pollution from agricultural and urban surface water run off can result in the deterioration of water quality at European sites. The two key nutrients of concern are phosphates and nitrates.

Phosphate

10.1.2 Phosphate can be organic (critical in DNA/RNA and energy production) and inorganic (in minerals) and is generally the limiting nutrient in freshwater environments. Phosphate contributes to the eutrophication of receiving waters, and hence additional inputs of phosphate are a principal concern in relation to the River Itchen SAC where excess phosphate may result in overgrowth of Ranunculus vegetation by epiphytic filamentous algae that compete directly with vascular plants for light and nutrients, potentially leading to loss of nutrient-sensitive species, and reduced species composition, extent and condition of riverine plant communities.

Nitrate

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

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

10.2 Sites Potentially Affected

- 10.2.1 Southampton is served by three waste water treatment works (WWTWs), including Woolston, Portswood and Millbrook which discharge into the River Itchen Estuary and the Tidal River Test (Amec Foster Wheeler, 2018). These watercourses form part of the Southampton Water Water Framework Directive (WFD) operational catchment where the overall water body status is classed as 'Moderate'. Elements not achieving 'Good' status include Dissolved Inorganic Nitrogen (Moderate), Mitigation Measures Assessment (Moderate or less) and Tributyltin Compounds (Fail).
- 10.2.2 There is not considered to be a potential pathway to the River Itchen SAC, given that Woolston and Portswood WWTWs both discharge into the Tidal River Itchen downstream of the SAC. However, there is considered to be a potential pathway to the Solent and Southampton Water SPA and Ramsar, the Solent Maritime SAC and the Solent and Dorset Coast pSPA.

10.3 Extent of Impact at Present

- 10.3.1 The JNCC data forms identify impacts from wastewater effluent / discharge as potential vulnerabilities for the River Itchen SAC, Solent and Southampton Water SPA / Ramsar and Solent Maritime SAC.
- 10.3.2 In June 2019 Natural England published advice on nutrient neutrality in the Solent region (Natural England, 2019a). During 2018 Natural England conducted an assessment of levels of nitrogen in designated sites within the Solent. The assessment identified units within Solent and Southampton Water SPA and Ramsar that are unfavourable for the interest features on account of elevated levels of inorganic nitrogen and biological indication of eutrophication shown by the abundance of macroalgae (Natural England, 2019a). The assessment also identified units within Solent and Southampton Water SPA and Ramsar that are in favourable condition but this is borderline and therefore these areas are at high risk. At the time of writing, no development in the City has yet achieved nutrient neutrality.

10.4 Potential Impact of the Local Plan

- 10.4.1 The Southampton City Vision Local Plan will provide for the delivery of additional dwellings in the City. The PUSH (now PFSH) Integrated Water Management Study (IWMS) used projected future housing numbers to calculate increases in effluent discharges across the South Hampshire sub-region based on assumed occupancy rates for the new housing, added to the current volume of treated effluent discharged from the relevant WWTW. The occupancy rates and flow estimates were based on a worst case scenario in 2018. The impact of this increase in treated sewage effluent on the receiving watercourses and coastal waters was then modelled and the results assessed against the current condition of the receiving waters. Where a

potentially significant deterioration was identified, indicative permit standards were calculated to prevent the deterioration⁶.

- 10.4.2 The IWMS assessments for Southampton indicated that there are no significant constraints to prevent future housing growth related to Portswood and Woolston WWTWs, although the Portswood works will require upgrades to its sewer networks. Although overall no significant impact or deterioration is predicted due to future housing growth, the Millbrook WWTW will require improvements by 2036 to increase capacity. The catchment has nitrate problems and catchment level nitrate measures are required (Amec Foster Wheeler, 2018). The IWMS concludes that there is uncertainty about the impact of local plan growth on designated sites, especially after 2020. It must also be noted that the housing numbers considered within the IWMS have now moved on and therefore these conclusions in relation to capacity will need to be revisited.
- 10.4.3 The Natural England 2019 guidance highlights that “*there is uncertainty as to whether new growth will further deteriorate designated sites*”, and therefore recommends that new development should achieve nutrient neutrality to address this uncertainty. A methodology is provided for calculating how nutrient neutrality can be achieved and this will be applied to development within the Southampton City Vision Local Plan as part of the HRA process.

⁶ N.B. An exceedance of a flow permit is not in itself an issue as the sewerage undertaker could apply to the Environment Agency for a new flow permit. This may be permitted where it is matched by an equivalent improvement in the quality of the water being discharged, thus protecting the receiving waters (i.e. overall there would be load standstill to the receiving waters).

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11 Conclusion

11.1 Summary

11.1.1 This Baseline Evidence Review has considered a range of potential impact pathways which will need to be considered as part of the HRA Screening process for the Southampton City Vision Local Plan. The evidence suggests that potential effects to European sites may arise from the following impacts associated with the Southampton City Vision Local Plan, at both a strategic and site level:

- ▶ Atmospheric Pollution;
- ▶ Flood Risk and Coastal Squeeze;
- ▶ Noise and Vibration;
- ▶ Recreational Disturbance;
- ▶ Site Specific Allocations;
- ▶ Tall Buildings and Collision Risk;
- ▶ Water Demand; and
- ▶ Water Quality.

11.1.2 Table 11.1 sets out which European Sites each of these impact pathways is likely to affect, as has been described in Chapters 3 to 10 of this report.

Table 11.1: Impact Pathways Corresponding to European Sites

Impact Pathway	European Site Potentially Affected
Atmospheric Pollution	River Itchen SAC Solent Maritime SAC Solent and Southampton Water SPA/Ramsar (The) New Forest SAC/SPA/Ramsar
Flood Risk and Coastal Squeeze	River Itchen SAC Solent Maritime SAC Solent and Southampton Water SPA/Ramsar site Solent and Dorset Coast pSPA
Noise and Vibration	River Itchen SAC Solent and Southampton Water SPA/Ramsar site
Recreational Disturbance	Solent and Southampton Water SPA/Ramsar site New Forest SPA/Ramsar
Site Specific Allocations	Solent and Southampton Water SPA/Ramsar site
Tall Buildings and Collision Risk	Solent and Southampton Water SPA/Ramsar site

Impact Pathway	European Site Potentially Affected
	Solent and Dorset Coast pSPA
Water Demand	River Itchen SAC
Water Quality	Solent Maritime SAC Solent and Southampton Water SPA/Ramsar site Solent and Dorset Coast pSPA

11.1.3 Emer Bog SAC and Mottisfont Bats SAC are not considered subject to any of these impact pathways on account of their distance from the City and its strategic road network. Mottisfont Bats SAC is designated on account of the population of Barbastelle bat (*Barbastella barbastellus*). The bats may forage up to 5-7 km from their maternity roosts, though some individuals in less favourable habitat may forage further to reach suitable feeding grounds (Natural England, 2019d). Southampton City is approximately 10km from the SAC boundary and therefore effects associated with development in the Southampton City Vision Local Plan are considered unlikely.

11.2 Screening for Likely Significant Effects

11.2.1 The HRA Screening stage will examine and screen the Southampton City Vision Local Plan’s policies and candidate site allocations; these will be categorised according to those which are deemed to be: (1) unlikely to have any negative effects; (2) unlikely to have any significant effects; (3) likely to have a significant effect alone (and may also have in-combination effects); and (4) unlikely to have any effect alone, but which may have an in-combination effect.

11.2.2 The findings will be presented in a Screening Report, comprising a screening assessment matrix, together with an interpretative commentary in terms of identified effects. If likely significant effects are identified at the screening stage then these will subsequently be taken forward for Appropriate Assessment.

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Appendix I – European Site Ecological Information

Emer Bog SAC	
Site Account	The site comprises an extensive valley bog which has been described as unparalleled in lowland England as an example of a young oligotrophic / mesotrophic basin mire, together with associated damp acidic grassland, heathland and developing woodland over Bracklesham Beds in the Hampshire Basin. The bog grades downstream into mature alder carr and upstream into heathland. To the south and west of Emer Bog, the site includes remnants of former common land, now acidic grassland. The invertebrate fauna of the bog and heath is of considerable interest and very large numbers of moths have been recorded.
Qualifying Features	<u>Habitats Directive Annex I Habitat</u> Transition mires and quaking bogs
Conservation Objectives	Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the Favourable Conservation Status of its Qualifying Features, by maintaining or restoring: <ul style="list-style-type: none"> - The extent and distribution of the qualifying natural habitat; - The structure and function (including typical species) of the qualifying natural habitat; and - The supporting processes on which the qualifying natural habitat rely.
Key Environmental Conditions Supporting Site Integrity	<ul style="list-style-type: none"> - Maintaining hydrological regime, including low nutrient status - Absence of non-native species - Retention and/or restoration of low scrub cover - Maintaining some continuous extent of exposed, open ground surface - Absence of eutrophication and acidification from atmospheric pollution

Mottisfont Bats SAC	
Site Account	The Mottisfont woodland, which is near Romsey in Hampshire, supports an important population of the rare Barbastelle bat

Mottisfont Bats SAC	
	<i>Barbastella barbastellus</i> . Mottisfont contains a mix of woodland types including hazel <i>Corylus avellana</i> coppice with standards, broadleaved plantation and coniferous plantation which the bats use for breeding, roosting, commuting and feeding.
Qualifying Features	<u>Habitats Directive Annex II Species</u> Barbastelle bat (<i>Barbastella barbastellus</i>)
Conservation Objectives	Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the Favourable Conservation Status of its Qualifying Features, by maintaining or restoring: <ul style="list-style-type: none"> - The extent and distribution of the habitats of qualifying species; - The structure and function of the habitats of qualifying species; - The supporting processes on which the habitats of qualifying species rely; - The populations of qualifying species; and - The distribution of qualifying species within the site.
Key Environmental Conditions Supporting Site Integrity	<ul style="list-style-type: none"> - Maintain or if appropriate restore the extent of supporting habitats and their range within this SAC - Careful management of habitats outside the site boundary which are important for bats, including linear landscape features which serve as flight lines and foraging areas - Maintain the properties of the underlying soil types - Absence of eutrophication and acidification from atmospheric pollution - No disturbance of roost sites - Unpolluted water and retained water quantity (both groundwater and surface water)

The New Forest SAC	
Site Account	<p>The New Forest is a large and complex ecosystem and one of the largest remaining relatively wild areas in the South of England attracting enormous numbers of visitors each year.</p> <p>The New Forest SAC and SPA supports an extensive and complex mosaic of habitats including wet and dry heaths and associated bogs and mires, wet and dry grasslands, ancient pasture woodlands, frequent permanent and temporary ponds and a network of streams and rivers. These habitats support an exceptional variety of flora and fauna including internationally important populations of breeding and over-wintering birds and other notable species such as southern damselfly, stag beetle and great crested newt.</p>

The New Forest SAC

The New Forest is one of the most important sites for wildlife in the UK and recognised as being of exceptional importance for nature conservation throughout the European Union. Over 90% of the SAC comprises the unenclosed land of the Crown Lands and adjacent commons, the remainder is managed by private owners and occupiers. Of fundamental importance to sustaining the exceptional quality on the open forest is the persistence of commoning, the commoners stock roam freely maintaining the structural diversity and richness of the habitats complemented by annual heathland cutting and burning programmes.

Qualifying Features

Habitats Directive 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-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
- Alkaline Fens

Habitats Directive Annex II Species

- Southern Damselfly *Coenagrion mercuriale*
- Stag Beetle *Lucanus cervus*
- Great Crested Newt *Triturus cristatus*

Conservation Objectives

Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the Favourable Conservation Status of its Qualifying Features, by maintaining or restoring:

The New Forest SAC

- The extent and distribution of qualifying natural habitats and habitats of qualifying species;
- The structure and function (including typical species) of qualifying natural habitats;
- The structure and function of the habitats of qualifying species;
- The supporting processes on which qualifying natural habitats and the habitats of qualifying species rely;
- The populations of qualifying species; and
- The distribution of qualifying species within the site.

Key Environmental Conditions Supporting Site Integrity

- Carefully balanced hydrological regime to maintain wet heath, mires and pools
- Retention and/or restoration of low scrub cover
- Active deer management
- Minimal air pollution (nitrogen deposition can cause compositional changes over time)
- Unpolluted water
- Minimal nutrient inputs
- Low recreational pressure
- Appropriate grazing regime
- Forestry and woodland management
- Absence of non-native species

River Itchen SAC

Site Account

The River Itchen is one of the `classic` chalk rivers of southern England, drawing most of its character from this geological stratum. The Itchen supports an abundant and exceptionally species rich aquatic flora. It has a primary notification for its river habitat, at SSSI level (chalk river type) and also under Habitats Directive Annex I (Code H3260, watercourses with *Ranunculion* and *Batrachion* vegetation). This habitat notification comprises the river channel, its banks and parts of its riparian zone. In addition, parts of the floodplain are notified for their wetland habitat, and the river discharges via Southampton Water into the Solent which has a range of habitat designations.

The site is additionally notified for a number of SSSI and Habitats Directive Annex II species features, including invertebrate assemblages and a key breeding population of the nationally rare southern damselfly *Coenagrion mercuriale*, white-clawed crayfish

River Itchen SAC	
	<p><i>Austropotamobius pallipes</i>-one of the last remaining strongholds in central southern England), Atlantic salmon <i>Salmo salar</i>, Bullhead <i>Cottus gobio</i> and Brook lamprey <i>Lampetra planeri</i>, and an expanding population of Otter <i>Lutra lutra</i>.</p> <p>The Itchen faces numerous pressures from water abstraction and flow diversions, discharges, agricultural runoff, channel modifications, fisheries management and human impacts associated with the urbanisation alongside much of the river's valley.</p>
Qualifying Features	<p><u>Habitats Directive Annex I Habitat</u></p> <ul style="list-style-type: none"> - Water courses of plain to montane levels with the <i>Ranunculion fluitantis</i> and <i>Callitriche-Batrachion</i> vegetation <p><u>Habitats Directive Annex II Species</u></p> <ul style="list-style-type: none"> - Atlantic salmon <i>Salmo salar</i> - Brook lamprey <i>Lampetra planeri</i> - Bullhead <i>Cottus gobio</i> - Otter <i>Lutra lutra</i> - Southern damselfly <i>Coenagrion mercuriale</i> - White-clawed (or Atlantic stream) crayfish <i>Austropotamobius pallipes</i>
Conservation Objectives	<p>Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the Favourable Conservation Status of its Qualifying Features, by maintaining or restoring:</p> <ul style="list-style-type: none"> - The extent and distribution of qualifying natural habitats and habitats of qualifying species; - The structure and function (including typical species) of qualifying natural habitats; - The structure and function of the habitats of qualifying species; - The supporting processes on which qualifying natural habitats and the habitats of qualifying species rely; - The populations of qualifying species; and - The distribution of qualifying species within the site.
Key Environmental Conditions Supporting Site Integrity	<ul style="list-style-type: none"> - Maintenance of flow velocities - low flows interact with nutrient inputs from point sources to produce localised increases in filamentous algae and nutrient tolerant macrophytes at the expense of <i>Ranunculus</i> - Low levels of siltation - Unpolluted water and low nutrient inputs - Grazing management

River Itchen SAC

- Absence of non-native species
- Retention and/or restoration of low scrub cover, particularly around ditches for southern damselfly
- Forestry and woodland management

Solent Maritime SAC

Site Account

The Solent encompasses a major estuarine system on the south coast of England with four coastal plain estuaries (Yar, Medina, King's Quay Shore, Hamble) and four bar-built estuaries (Newtown Harbour, Beaulieu, Langstone Harbour, Chichester Harbour). The Solent and its inlets are unique in Britain and Europe for their hydrographic regime with its double tides, as well as for the complexity of the marine and estuarine habitats present within the area. Sediment habitats within the estuaries include extensive estuarine flats, intertidal areas that support eelgrass *Zostera spp.*, 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. As well as occurring within the estuaries, mudflats and sandflats are found throughout the Solent and form the predominant intertidal substrates. 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.

All four species of cordgrass found within the UK are present within the Solent and it is one of only two UK sites with significant amounts of the native small cordgrass *Spartina maritima*. The rich intertidal mudflats, saltmarsh, shingle beaches and adjacent coastal habitats, including grazing marsh, reedbeds and damp woodland, support nationally and internationally important numbers of migratory and over-wintering waders and waterfowl as well as important breeding gull and tern populations.

Qualifying Features

Habitats Directive Annex I Habitat

- Annual vegetation of drift lines
- Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*)
- Coastal lagoons (priority habitat)
- *Spartina* swards (*Spartinion maritimae*) (Cord-grass swards)
- Estuaries
- Mudflats and sandflats not covered by seawater at low tide (Intertidal mudflats and sandflats)
- Perennial vegetation of stony banks (Coastal shingle vegetation outside the reach of waves)

Solent Maritime SAC	
	<ul style="list-style-type: none"> - Salicornia and other annuals colonising mud and sand (Glasswort and other annuals colonising mud and sand) - Sandbanks which are slightly covered by sea water all the time (Subtidal sandbanks) - Shifting dunes along the shoreline with <i>Ammophila arenaria</i> (white dunes) (Shifting dunes with marram) <p><u>Habitats Directive Annex II Species</u></p> <ul style="list-style-type: none"> - Desmoulin’s whorl snail <i>Vertigo moulinsiana</i>
Conservation Objectives	<p>Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the Favourable Conservation Status of its Qualifying Features, by maintaining or restoring:</p> <ul style="list-style-type: none"> - The extent and distribution of qualifying natural habitats and habitats of qualifying species: - The structure and function (including typical species) of qualifying natural habitats: - The structure and function of the habitats of qualifying species: - The supporting processes on which qualifying natural habitats and the habitats of qualifying species rely: - The populations of qualifying species; and - The distribution of qualifying species within the site.
Key Environmental Conditions Supporting Site Integrity	<ul style="list-style-type: none"> - Low recreational pressure - Sufficient space between the site and development to allow for managed retreat of intertidal habitats and avoid coastal squeeze - No dredging or land-claim of coastal habitats - Unpolluted water - Absence of nutrient enrichment in the intertidal zone - Absence of eutrophication and acidification from atmospheric pollution - Absence of non-native species - Egg collection licensing - Appropriate pest control - Maintenance of freshwater inputs

Solent and Southampton Water SPA

Site Account

The Solent and Southampton Water SPA is located on the south English coast. The area covered extends from Hurst Spit to Hill Head along the south coast of Hampshire, and from Yarmouth to Whitecliff Bay along the north coast of the Isle of Wight. The site comprises a series of estuaries and harbours with extensive mud-flats and saltmarshes together with adjacent coastal habitats including saline lagoons, shingle beaches, reedbeds, damp woodland and grazing marsh. The mud-flats support beds of *Enteromorpha spp.* and *Zostera spp.* and have a rich invertebrate fauna that forms the food resource for the estuarine birds. In summer, the site is of importance for breeding seabirds, including gulls and four species of terns. In winter, the SPA holds a large and diverse assemblage of waterbirds, including geese, ducks and waders. Dark-bellied Brent goose *Branta b. bernicla* also feed in surrounding areas of agricultural land outside the SPA.

Qualifying Features

Wild Birds Directive Article 4.1 Qualification: Annex I Species

- Mediterranean gull *Larus melanocephalus*, 2 pairs representing at 8.2 -13.9% of the breeding population in Great Britain (5 year peak mean, 1994-1998)
- Sandwich tern *Sterna sandvicensis*, 231 pairs representing at least 1.7% of the breeding population in Great Britain (5 year peak mean, 1993-1997)
- Roseate tern *Sterna dougallii*, 2 pairs representing at least 3.3% of the breeding population in Great Britain (5 year peak mean, 1993-1997)
- Common tern *Sterna hirundo*, 267 pairs representing at least 2.2% of the breeding population in Great Britain (5 year peak mean, 1993-1997)
- Little tern *Sterna albifrons*, 49 pairs representing at least 2.0% of the breeding population in Great Britain (5 year peak mean, 1993-1997)

Wild Birds Directive Article 4.2 Qualification: Migratory Species not listed in Annex I

- Dark-bellied brent goose *Branta bernicla bernicla*, 7,506 individuals representing at least 2.5% of the wintering Western Siberia/Western Europe population (5 year peak mean, 1992/3-1996/7)
- Eurasian teal *Anas crecca*, 4,400 individuals representing at least 1.1% of the wintering Northwestern Europe population (5 year peak mean, 1992/3-1996/7)
- Ringed plover *Charadrius hiaticula*, 552 individuals representing at least 1.1% of the wintering Europe/Northern Africa - wintering population (5 year peak mean, 1992/3-1996/7)
- Black-tailed godwit *Limosa limosa islandica*, 1,125 individuals representing at least 1.6% of the wintering Iceland - breeding

Solent and Southampton Water SPA	
	<p>population (5 year peak mean, 1992/3-1996/7)</p> <p><u>Birds Directive Article 4.2 Qualification: Internationally Important Assemblage</u></p> <p>- Over winter, the area regularly supports 51,361 individual waterfowl (5 year peak mean 1992/93 – 1996/97)</p>
Conservation Objectives	<p>Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the aims of the Wild Birds Directive, by maintaining or restoring:</p> <ul style="list-style-type: none"> - The extent and distribution of the habitats of the qualifying features; - The structure and function of the habitats of the qualifying features; - The supporting processes on which the habitats of the qualifying features rely; - The population of each of the qualifying features; and - The distribution of the qualifying features within the site.
Key Environmental Conditions Supporting Site Integrity	<ul style="list-style-type: none"> - Low recreational pressure both on shore and offshore can avoid disturbance effects during sensitive (over-wintering) periods - Sufficient space between the site and development to allow for managed retreat of intertidal habitats and avoid coastal squeeze - No dredging or land-claim of coastal habitats - Unpolluted water - Absence of nutrient enrichment in the intertidal zone - Absence of eutrophication and acidification from atmospheric pollution - Absence of non-native species - Egg collection licensing - Appropriate pest control - Maintenance of freshwater inputs which are of value for providing a localised increase in prey biomass for certain bird species, specific microclimatic conditions and are used for preening and drinking

Solent and Southampton Water Ramsar

Site Account

The area covered extends from Hurst Spit to Gilkicker Point along the south coast of Hampshire and along the north coast of the Isle of Wight. The site comprises of estuaries and adjacent coastal habitats including intertidal flats, saline lagoons, shingle beaches, saltmarsh, reedbeds, damp woodland, and grazing marsh. The diversity of habitats support internationally important numbers of wintering waterfowl, important breeding gull and tern populations and an important assemblage of rare invertebrates and plants. The estuaries and harbours of the Solent are particularly sheltered and form the largest number and tightest cluster of small estuaries anywhere in Great Britain. The Solent and Isle of Wight system is notable for its large range and extent of different habitats.

The intertidal area is predominantly sedimentary in nature with extensive intertidal mud and sandflats within the sheltered harbours and areas of gravel and pebble sediments on more exposed beaches. These conditions combine to favour an abundant benthic fauna and green algae which support high densities of migrant and over-wintering wildfowl and waders. Eelgrass *Zostera* beds occur discontinuously along the north shore of the Isle of Wight and in a few places along the northern shore of the Solent.

The Solent system supports a wide range of saltmarsh communities. Upper saltmarshes are dominated by sea purslane *Atriplex portulacoides*, sea plantain *Plantago maritima*, sea meadow grass *Puccinellia maritima* and sea lavender *Limonium vulgare*; locally thrift *Armeria maritima* and the nationally scarce golden samphire *Inula crithmoides* are abundant. Lower saltmarsh vegetation tends to be dominated by sea purslane, cord grass *Spartina spp.*, glasswort *Salicornia spp.* and sea-blite *Suaeda maritima*. Cord-grasses dominate much of the saltmarsh in Southampton Water and in parts of the Solent and it was the original location of the introduction of *Spartina alterniflora* and subsequent hybridisation with the native species.

There are several shingle spits including Hurst spit, Needs Ore Point, Calshot spit and Newtown Harbour spits which support a characteristic shingle flora. A range of grassland types lie inshore of the intertidal zone including unimproved species-rich neutral and calcareous grasslands, brackish grazing marsh systems and reed dominated freshwater marshes.

Qualifying Features

Ramsar Convention 1971

Criterion 1

- Many wetland habitats characteristic of the biogeographic region: saline lagoons, saltmarshes, estuaries, intertidal flats, shallow coastal waters, grazing marshes, reedbeds, coastal woodland and rocky boulder reefs.

Criterion 2

- Important assemblage of rare plants and invertebrates: 33 British Red Data Book invertebrates and at least eight British Red Data Book plants are represented on site.

Criterion 5

Solent and Southampton Water Ramsar	
	<ul style="list-style-type: none"> - Winter assemblage of 51,343 Waterfowl over winter (5 year peak mean 1998/99-2002/2003). <p><i>Criterion 6</i></p> <p>On Passage</p> <ul style="list-style-type: none"> - Ringed Plover <i>Charadrius hiaticula</i> <p>Overwintering</p> <ul style="list-style-type: none"> - Dark-bellied Brent Goose <i>Branta bernicla bernicla</i> - Teal <i>Anas crecca</i> - Black-tailed Godwit <i>Limosa limosa islandica</i>
Conservation Objectives	<p>Ramsar sites do not have agreed conservation objectives, but the Solent & Southampton Water Ramsar and SPA sites share the same boundaries and were designated for similar features, therefore SPA conservation objectives will apply:</p> <ul style="list-style-type: none"> - The extent and distribution of the habitats of the qualifying features; - The structure and function of the habitats of the qualifying features; - The supporting processes on which the habitats of the qualifying features rely; - The population of each of the qualifying features; and - The distribution of the qualifying features within the site.
Key Environmental Conditions Supporting Site Integrity	<ul style="list-style-type: none"> - Low recreational pressure both on shore and offshore can avoid disturbance effects during sensitive (over-wintering) periods - Sufficient space between the site and development to allow for managed retreat of intertidal habitats and avoid coastal squeeze - No dredging or land-claim of coastal habitats - Unpolluted water - Absence of nutrient enrichment in the intertidal zone - Absence of eutrophication and acidification from atmospheric pollution - Absence of non-native species - Egg collection licensing

Solent and Southampton Water Ramsar

- Appropriate pest control
- Maintenance of freshwater inputs which are of value for providing a localised increase in prey biomass for certain bird species, specific microclimatic conditions and are used for preening and drinking

New Forest SPA

Site Account

The New Forest is a large and complex ecosystem and one of the largest remaining relatively wild areas in the South of England attracting enormous numbers of visitors each year.

The New Forest SAC and SPA supports an extensive and complex mosaic of habitats including wet and dry heaths and associated bogs and mires, wet and dry grasslands, ancient pasture woodlands, frequent permanent and temporary ponds and a network of streams and rivers. These habitats support an exceptional variety of flora and fauna including internationally important populations of breeding and over-wintering birds and other notable species such as southern damselfly, stag beetle and great crested newt. The New Forest is one of the most important sites for wildlife in the UK and recognised as being of exceptional importance for nature conservation throughout the European Union. Over 90% of the SAC comprises the unenclosed land of the Crown Lands and adjacent commons, the remainder is managed by private owners and occupiers. Of fundamental importance to sustaining the exceptional quality on the open forest is the persistence of commoning, the commoners stock roam freely maintaining the structural diversity and richness of the habitats complemented by annual heathland cutting and burning programmes.

Qualifying Features

Wild Birds Directive Article 4.1 Qualification: Annex I Species

- Dartford Warbler (*Sylvia undata*), 538 pairs representing at least 33.6% of the breeding population in Great Britain at the time of SPA classification
- Honey Buzzard (*Pernis apivorus*), 2 pairs representing at least 10.0% of the breeding population in Great Britain at the time of SPA classification
- Nightjar (*Caprimulgus europaeus*), 300 pairs representing at least 8.8% of the breeding population in Great Britain at the time of SPA classification
- Woodlark (*Lullula arborea*), 177 pairs representing at least 12.3% of the breeding population in Great Britain at the time of SPA classification
- Hen Harrier (*Circus cyaneus*) 15 individuals representing at least 2.0% of the wintering population in Great Britain at the time of SPA classification

New Forest SPA	
	<p><u>Wild Birds Directive Article 4.2 Qualification: Migratory Species not listed in Annex I</u></p> <ul style="list-style-type: none"> - Hobby (<i>Falco Subbuteo</i>) – up to 25 pairs representing around 3% of the British breeding population at the time of SPA classification - Wood Warbler (<i>Phylloscopus trochilus</i>) – in excess of 350 pairs representing at least 3% of the British breeding population at the time of SPA classification
Conservation Objectives	<p>Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the aims of the Wild Birds Directive, by maintaining or restoring:</p> <ul style="list-style-type: none"> - The extent and distribution of the habitats of the qualifying features; - The structure and function of the habitats of the qualifying features; - The supporting processes on which the habitats of the qualifying features rely; - The population of each of the qualifying features; and - The distribution of the qualifying features within the site.
Key Environmental Conditions Supporting Site Integrity	<ul style="list-style-type: none"> - Carefully balanced hydrological regime to maintain wet heath, mires and pools - Retention and/or restoration of low scrub cover - Active deer management - Minimal air pollution (nitrogen deposition can cause compositional changes over time) - Unpolluted water - Minimal nutrient inputs - Low recreational pressure - Appropriate grazing regime - Forestry and woodland management - Absence of non-native species
The New Forest Ramsar	
Site Account	The New Forest is an area of semi-natural vegetation including valley mires, fens and wet heath within catchments whose

The New Forest Ramsar	
	<p>uncultivated and undeveloped state buffer the mires against adverse ecological change. The habitats present are of high ecological quality and diversity with undisturbed transition zones.</p> <p>The suite of mires is regarded as the locus classicus of this type of mire in Britain. Other wetland habitats include numerous ponds of varying size and water chemistry including several ephemeral ponds and a network of small streams mainly acidic in character which have no lowland equivalent in the UK. The plant communities in the numerous valleys and seepage step mires show considerable variation, being affected especially by the nutrient content of groundwater. In the most nutrient-poor zones, Sphagnum bog-mosses, cross-leaved heath, bog asphodel, common cottongrass and similar species predominate. In more enriched conditions the communities are more fen-like.</p>
Qualifying Features	<p><u>Ramsar Convention 1971</u></p> <p><i>Criterion 1</i></p> <ul style="list-style-type: none"> - High density of valley mire and wet heaths <p><i>Criterion 2</i></p> <ul style="list-style-type: none"> - Diverse assemblage of wetland plants and animals; seven species of nationally rare plant and 65 British Red Data Book species of invertebrate. <p><i>Criterion 3</i></p> <ul style="list-style-type: none"> - Mire habitats of ecological quality and diversity with undisturbed transition zones. The invertebrate fauna of the site is important due to the concentration of rare and scarce wetland species. The whole site complex, with its examples of semi-natural habitats is essential to the genetic and ecological diversity of southern England.
Conservation Objectives	<p>Ramsar sites do not have agreed conservation objectives, but the New Forest Ramsar and SAC sites share the same boundaries and were designated for similar features, therefore SAC conservation objectives will apply:</p> <ul style="list-style-type: none"> - The extent and distribution of qualifying natural habitats and habitats of qualifying species; - The structure and function (including typical species) of qualifying natural habitats; and - The supporting processes on which qualifying natural habitats rely.
Key Environmental Conditions Supporting Site Integrity	<ul style="list-style-type: none"> - Carefully balanced hydrological regime to maintain wet heath, mires and pools - Retention and/or restoration of low scrub cover - Active deer management - Minimal air pollution (nitrogen deposition can cause compositional changes over time)

The New Forest Ramsar

- Unpolluted water
- Minimal nutrient inputs
- Low recreational pressure
- Appropriate grazing regime
- Forestry and woodland management
- Absence of non-native species

Solent and Dorset Coast pSPA

Site Account

This potential SPA covers an area of approximately 255.2km² and extends from the Isle of Purbeck in the West to Bognor Regis in the East, following the coastline on either side to the Isle of Wight and into Southampton Water. It will have its landward boundary at Mean Low Water (MLW) where it abuts any existing SPA where terns are already a feature (except for Pagham Harbour where the landward boundary of the pSPA extends to MHW and hence overlaps with the existing SPA; this is because the easternmost extremity of the pSPA is determined by the modelled usage of sandwich terns foraging from Chichester & Langstone Harbours SPA, and sandwich terns are not a qualifying feature of Pagham Harbour SPA. Elsewhere the landward boundary will be Mean High Water (MHW) so as to afford the birds protection within the intertidal zone; for example at Portsmouth Harbour. The seaward extent of the new boundary is a composite of various foraging ranges of Tern species away from existing colonies within the area.

There are internationally important populations of common, sandwich and little tern breeding at a number of terrestrial SPAs around the Solent and within Poole Harbour. This area is particularly important to the birds as much of the sea around their breeding colonies is the ideal habitat for their foraging which they do primarily by plunge diving for fish.

All seabird species are termed central place foragers. This means that they go out from and return to a central place (their nest) on every foraging trip. This constraint means that they have a limited foraging range and have a strong energetic incentive to forage as close to their colony as they can. Therefore, the waters around the existing areas of SPA where birds breed also need to be considered for protection.

Qualifying Features

Wild Birds Directive Article 4.1 Qualification: Annex I Species

- Little Tern *Sterna albifrons* (breeding)
- Sandwich Tern *Sterna sandvicensis* (breeding)
- Common Tern *Sterna albifrons* (breeding)

Solent and Dorset Coast pSPA**Conservation Objectives**

Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the aims of the Wild Birds Directive, by maintaining or restoring:

- The extent and distribution of the habitats of the qualifying features;
- The structure and function of the habitats of the qualifying features;
- The supporting processes on which the habitats of the qualifying features rely;
- The population of each of the qualifying features; and
- The distribution of the qualifying features within the site.

Key Environmental Conditions Supporting Site Integrity

- Low recreational / disturbance pressure close to nesting areas at high water mark
- Low predation levels close to nesting areas at high water mark

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