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Habitats Regulations Assessment for the Southampton City Centre Action Plan

Proposed Submission Stage

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Habitats Regulations Assessment for the Southampton City Centre Action Plan

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Abbreviations

AA	Appropriate Assessment
AADT	Annual Average Daily Traffic
CDS	Coastal Defence Strategy
CFERMS	Coastal Flood and Erosion Risk Management Strategy
FCT	Favourable Condition Table
HDV	Heavy Duty Vehicle
HRA	Habitats Regulations Assessment
HTL	Hold the Line
IROPI	Imperative Reasons of Overriding Public Interest
keq/ha/yr	Kilograms equivalent per hectare per year
Kg/ha/yr	Kilograms per hectare per year
LDD	Local Development Document
LNR	Local Nature Reserve
LSTF	Local Sustainable Transport Fund
NGR	National Grid Reference
NO _x	Oxides of nitrogen
ONS	Office for National Statistics
RSS	Regional Spatial Strategy
SAC	Special Area of Conservation
SANG	Suitable Alternative Natural Greenspace
SMP	Shoreline Management Plan
SNCI	Site of Nature Conservation Importance
SPA	Special Protection Area
SSSI	Site of Special Scientific Interest
µgm ⁻³	Micrograms per cubic metre
WRMP	Water Resource Management Plan

Executive Summary

E1 Introduction

E1.1 Southampton City Council is undertaking a Habitats Regulations Assessment (HRA) of its City Centre Action Plan (CCAP), part of the City's Local Development Framework. This is a requirement of regulation 102 of the Conservation of Habitats and Species Regulations 2010 (the Habitats Regulations).

E1.2 This report follows on from earlier stages in the assessment process, including the Baseline Evidence Review Report, and the screening stage which established what '*likely significant effects*' the plan could have on the nature conservation interests of European-protected areas in and around the City. The current report presents the findings and recommendations of the assessment, and seeks to establish whether or not there will be any adverse effects on the ecological integrity of these European sites as a result of proposals in the plan.

E2 Scope of the Assessment

E2.1 Drawing on the scope of the Core Strategy HRA, the European sites that are first considered for inclusion in the assessment are listed below:

- ▶ Chichester and Langstone Harbours Special Protection Area (SPA) / Ramsar site;
- ▶ Emer Bog Special Area of Conservation (SAC);
- ▶ New Forest SAC / SPA / Ramsar;
- ▶ Portsmouth Harbour SPA / Ramsar;
- ▶ River Itchen SAC;
- ▶ Solent Maritime SAC; and
- ▶ Solent and Southampton Water SPA / Ramsar.

E2.2 The screening process found that significant effects were a likely outcome of the CCAP proposals in relation to:

- ▶ Atmospheric pollution;
- ▶ Flood risk management and potential mobilisation of contaminants;
- ▶ Recreational disturbance;
- ▶ Loss or degradation of a wader roost; and
- ▶ Collision risk, light pollution, noise and vibration.

E2.3 Likely significant effects were identified for the following sites:

- ▶ Chichester and Langstone Harbours SPA / Ramsar;
- ▶ New Forest SAC / SPA / Ramsar;
- ▶ Portsmouth Harbour SPA / Ramsar;
- ▶ River Itchen SAC;
- ▶ Solent Maritime SAC; and
- ▶ Solent and Southampton Water SPA / Ramsar.

E2.4 Emer Bog was screened out because of its distance from the City Centre and because no major roads (which could carry traffic to/from the City Centre) pass within 200m of the site.

E2.5 Natural England, the statutory agency for nature conservation, concurred with the majority of these findings in its consultation response to the screening stage. However, it also requested that an assessment be made of the CCAP's possible impact on the River Itchen SAC through increasing water demand because alternative sources of drinking water supply that would enable reduced abstractions from the Itchen have not yet been identified. Both Natural England and the Wildlife Trust, the only other respondent to screening consultations, requested that proposals at Ocean Village (almost fully consented but not yet fully implemented) be assessed in combination with other proposals to ensure no impacts in relation to noise, vibration or mobilisation of contaminants. The Wildlife Trust also requested that possible effects to wader and Brent goose sites on the east bank of the Itchen are also considered.

E3 Results of the Assessment

Atmospheric pollution

E3.1 The CCAP acknowledges the potential for development to lead to increased traffic flows and emissions and sets out a range of practical measures to help prevent this and, while the quantum of development proposed has decreased, increases in background traffic flow can be expected whether or not city centre development continues. The primary aim of the CCAP with regard to transport is to reduce the need to travel, encourage modal shift and reduce traffic congestion. However, further measures are recommended to help ensure that increases in traffic movements do not lead to adverse effects on qualifying habitats and species.

E3.2 **It is concluded that the CCAP will not lead to adverse effects on integrity as a result of atmospheric pollution. The CCAP is considered to be Habitats Regulations compliant in this respect.**

Disturbance

E3.3 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 new housing provision, and development and promotion of tourism (particularly along the coast). This may result in adverse effects on European site integrity,

particularly those designated for an internationally important bird assemblage, especially when considered in combination with the effects of other Local Development Documents in South Hampshire. Such sites include the New Forest SPA and Solent marine sites.

- E3.4 Core Strategy Policy CS21 (Protecting and Enhancing Open Space) sets out the Council's commitment to retain, enhance and supplement the City's existing multi-functional open spaces, and refers to the Council's joint-working with the landowner and Test Valley Borough Council to develop a forest park at Lords Wood on the northern city boundary in order to relieve pressure on the New Forest. The most effective way of avoiding increased visitor footfall within European sites as a result of CCAP development will be to encourage residents to use the parks and Common in or closer to the city centre. The CCAP sets out an approach to create a more attractive and coherent green space offer. This is based on protecting and enhancing existing parks and open spaces; creating new civic spaces; and improving pedestrian and cycle access to existing parks by creating 'green links'.
- E3.5 Meanwhile, the Solent Disturbance and Mitigation Project considers the available options for avoiding and mitigating impacts to the overwintering bird assemblage of the Solent European sites, in the context of current planning policy and regulation. It outlines a strategy of projects including 'quick wins' and longer term behavioural change initiatives for reducing the overall adverse effect such that planned new developments can be accommodated.
- E3.6 **It is concluded that the CCAP will not lead to adverse effects on integrity as a result of disturbance. The CCAP is considered to be Habitats Regulations compliant in this respect.**

Water demand

- E3.7 There is concern over the sustainability of abstractions from the River Itchen SAC to feed the public water supply. Broad agreement has been reached between the Environment Agency and water companies on the timing and level of reductions in licenced abstraction needed to avoid continuing adverse effects on the integrity of the site. However, there is a potential conflict with the conservation objectives of the River Test SSSI, from where additional water could be abstracted in substitute for abstractions from the Itchen, leading to uncertainty over whether the necessary reductions can be achieved in the required timeframe.
- E3.8 Core Strategy Policy CS20 (Tackling and Adapting to Climate Change) includes sustainability standards required for all new development (including that within the City Centre) and a section on conserving water resources. As all development that comes forward within the City Centre will need to be in conformity with the Core Strategy as well as the CCAP, there is a good degree of confidence that water efficiency measures within new dwellings will be secured. Coupled with Southern Water's programme of universal metering (which applies to all new development, as well as retrospectively to achieve 90% coverage by 2015), the Core Strategy's water efficiency standards of 105 litres per person per day to 2015, and 80l/p/d from 2016, are already considered good practice. No further measures for demand management through the CCAP are considered necessary.

- E3.9 **It is concluded that the CCAP will not lead to adverse effects on the integrity of River Itchen SAC as a result of water demand. The CCAP is considered to be Habitats Regulations compliant in this respect.**

Mobilisation of contaminants

- E3.10 The boundary of the City Centre area is not adjacent to any internationally designated habitats. However, the area's eastern boundary is co-terminous with the western bank of the River Itchen (undesignated, but gateway to River Itchen SAC), and the Solent and Southampton Water SPA / Ramsar site boundary reaches over the eastern bank and approximately mid-way across the river. Impacts on water quality can be caused by polluted surface water runoff. There is a potential pathway for this impact to occur if works carried out during construction of flood defences mobilise historic contamination which then flows directly or indirectly into the waters of designated sites. In the case of the Solent and Southampton Water SPA / Ramsar, contaminants can build up in the food chain, resulting in toxic effects on birds and their prey. In relation to the River Itchen SAC, there would be potential for contamination to affect Atlantic salmon as they migrate from their spawning ground in the SAC to Southampton Water.
- E3.11 There are no policies within the CCAP that discuss potentially contaminated land and how redevelopment should address it. However, wider planning policy and regulation (e.g. National Planning Policy Framework) require the extent of contamination within a site to be assessed and remediated prior to redevelopment.
- E3.12 **It is concluded that adverse effects on the integrity of Solent and Southampton Water SPA/Ramsar and River Itchen SAC are unlikely to occur as a result of contamination. The CCAP is considered to be Habitats Regulations compliant in this respect.**

Loss or degradation of wader roosts

- E3.13 Development may result in the actual or functional loss of areas outside European site boundaries which are nonetheless important to the integrity of the sites if the population stability of species for which the site was designated is shown to have a critical reliance on the use of such supporting areas. Examples include foraging areas for Brent geese, or roosting sites for wading birds, at high water when the intertidal areas within European sites are submerged.
- E3.14 No sites of importance to Brent geese within the CCAP area were identified, however, Royal Pier, part of a major development site, is classified as of uncertain importance to roosting oystercatcher. Oystercatcher (an Annex 2 (migratory) species) appears on the citation for one of the Solent sites, Chichester and Langstone Harbours Ramsar. It is suggested that the loss in Southampton of a small oystercatcher roost of uncertain importance would be unlikely to affect the ecological integrity of the Chichester and Langstone Harbours Ramsar. Further surveys are recommended prior to redevelopment of the site, and potential mitigation measures are identified should they become necessary.

- E3.15 **It is concluded that adverse effects on the integrity of Chichester and Langstone Harbours Ramsar are unlikely to occur from the loss of a wader roost in Southampton. The CCAP is considered to be Habitats Regulations compliant in this respect.**

Collision risk, light, noise and vibration

- E3.16 Collision risk and light pollution are interrelated to an extent (because birds can become attracted or entrapped by light) and tall buildings in particular can present a risk to birds when migrating or commuting between roosting and foraging areas. The potential for impact is influenced by the location and design of new buildings and their surrounding amenity (such as landscaping and security lighting). Noise and vibration impacts can alter the behaviour of both birds and fish, and result in avoidance of otherwise suitable habitats potentially creating a barrier to movement. The location, timing and construction methods for new developments are key determinants in the scale of potential impacts.
- E3.17 The effects of a number of key development sites close to the waterfront are considered within the HRA. Recommendations for avoidance and mitigation measures are made and these are referred to within the CCAP.
- E3.18 **It is concluded that adverse effects on the integrity of Solent and Southampton Water SPA/Ramsar and River Itchen SAC are unlikely to occur as a result of collision risk, light, noise or vibration. The CCAP is considered to be Habitats Regulations compliant in this respect.**

E4 Conclusions

- E4.1 The report presents the Habitats Regulations Assessment of the City Centre Action Plan for Southampton. It presents a screening assessment to determine which aspects of the plan are likely to lead to significant effects, and an Appropriate Assessment to determine whether there will be adverse effects on the integrity of European sites in and around the City.
- E4.2 The assessment establishes the nature of effects on ecological integrity and assesses the avoidance and mitigation measures put forward within the CCAP, drawing on the information that is currently available. It provides recommendations for additional avoidance and mitigation measures to help ensure that adverse effects on the European sites can be avoided.
- E4.3 Site-specific impacts, such as mobilisation of contaminants, loss of a potential wader roost, collision mortality risk, and noise and vibration effects, are considered avoidable via the measures proposed in following chapters. Strategically operating impacts will be managed through a combination of joint-working initiatives and monitoring of their effectiveness. In summary, the CCAP is considered to be Habitats Regulations compliant.
- E4.4 Following the current consultation exercise, the HRA will be revisited to assess any policy changes which are considered necessary in relation to the sites' conservation objectives.

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1 Introduction

1.1 Background

- 1.1.1 Southampton City Council (SCC) is undertaking a Habitats Regulations Assessment (HRA) of its City Centre Action Plan (CCAP), part of the City's Local Development Framework. This is a requirement of regulation 102 of the Conservation of Habitats and Species Regulations 2010 (the Habitats Regulations).
- 1.1.2 This report follows on from earlier stages in the assessment process, including the Baseline Evidence Review Report, and the screening stage which established what '*likely significant effects*' the plan could have on the nature conservation interests of European-protected areas in and around the City. The current report presents the findings and recommendations of the assessment, and seeks to establish whether or not there will be any adverse effects on the ecological integrity of these European sites as a result of proposals in the plan.

1.2 Habitats Regulations Assessment

- 1.2.1 The application of Habitats Regulations Assessment to land use plans is a requirement of the Conservation of Habitats and Species Regulations 2010, the UK's transposition of European Union Directive 92/43/EEC *on the conservation of natural habitats and of wild fauna and flora* (the Habitats Directive). HRA must be applied to all Local Development Documents (LDD) in England and Wales and aims to assess the potential effects of the plan against the conservation objectives of any sites designated for their nature conservation importance as part of a system known collectively as the Natura 2000 network of European sites.
- 1.2.2 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 (SACs, designated under the Habitats Directive) and Special Protection Areas (SPAs, designated under European Union Directive 2009/147/EC *on the conservation of wild birds* (the Birds Directive)). Meanwhile, Government policy and Circular 06/05 (ODPM, 2005) recommends 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 Under regulation 102 of the Habitats Regulations, the assessment must determine whether or not a plan will adversely affect the integrity of the European site(s) concerned. Where negative effects are identified, the process should consider alternatives to the proposed actions and explore mitigation opportunities, whilst adhering to the precautionary principle. The European Commission (2000a) describes the principle as follows:

If a preliminary scientific evaluation shows that there are reasonable grounds for concern that a particular activity might lead to damaging effects on the environment, or on human, animal or

plant health, which would be inconsistent with the protection normally afforded to these within the European Community, the Precautionary Principle is triggered.

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

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

- 1.2.4 The hierarchy of intervention is important: where significant effects are likely or uncertain, plan makers must firstly seek to avoid the effect, for example, through a change of policy. If this is not possible, mitigation measures should be explored to remove or reduce the effect. If neither avoidance, nor subsequent mitigation is possible, alternatives to the plan should be considered. Such alternatives should explore ways of achieving the plan's objectives that avoid significant effects entirely. If there are no alternatives suitable for removing an adverse effect, plan-makers must demonstrate, under the conditions of Regulation 103 of the Habitats Regulations, that there are Imperative Reasons of Overriding Public Interest (IROPI) to continue with the proposal. This is widely perceived as an undesirable position and should be avoided if at all possible.

1.3 Guidance and Best Practice

- 1.3.1 Guidance on Habitats Regulations Assessment has been published in draft form by the Government (Department for Communities and Local Government (DCLG), 2006). This draws on advice from a range of experts as well as European Union guidance regarding methodology for Appropriate Assessment of plans (European Commission, 2001).
- 1.3.2 The guidance recognises that there is no statutory method for undertaking Habitats Regulations Assessment and that the adopted method must be *appropriate* to its purpose under the Habitats Directive and Regulations. The guidance identifies three stages to the HRA process:
- ▶ AA1: Likely Significant Effects (Screening)
 - ▶ AA2: Appropriate Assessment and Ascertaining the Effect on Integrity
 - ▶ AA3: Mitigation Measures and Alternative Solutions
- 1.3.3 Where stage AA3 cannot produce alternative solutions or mitigation to remove or reduce adverse effects to insignificant levels, there may be a need to explore Imperative Reasons of Overriding Public Interest. This is discouraged by DCLG and will only apply in exceptional circumstances. The three stages collectively make up Habitats Regulations Assessment, while Stage AA2 is the point at which Appropriate Assessment of the plan is carried out if the evidence points to a need for such an assessment.

1.3.4 Natural England has produced more prescriptive draft guidance on the assessment of Local Development Documents under the provisions of the Habitats Regulations (Tyldesley, 2009). This introduces the concept of a stepped approach to the assessment process and fits within the framework of the three stages identified by DCLG. Whilst the guidance is draft it nevertheless provides a helpful approach to HRA and is followed within this report. **Table 1.1** illustrates how the two approaches (DCLG and Natural England) can be operated as one integrated methodology to achieve the same outcome from each approach.

Table 1.1: Stages in the HRA process drawing on guidance from DCLG and Natural England

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

1.4 Purpose and Structure of this Document

1.4.1 This report documents the process, findings and recommendations of HRA stages AA2 and AA3 as described in the DCLG (2006) guidance. It identifies, analyses and quantifies (where possible) potential negative impacts on the European sites in question, to determine their effects on site integrity.

1.4.2 It presents measures to avoid or reduce these effects to the point at which they are no longer significant in relation to the sites' conservation objectives, either alone or in combination with other plans and projects. The remaining sections of the report are as follows:

- ▶ **Chapter Two:** gives an overview of the City and introduces the CCAP;
- ▶ **Chapter Three:** identifies the European sites which are receptors of the plans' likely significant effects;
- ▶ **Chapter Four:** reviews and updates the screening stage of HRA. It introduces the Appropriate Assessment stage and describes how to interpret it;
- ▶ **Chapters Five to Ten:** describe the findings of the assessment, and introduce avoidance and mitigation measures;
- ▶ **Chapter Eleven:** illustrates the outcomes of the HRA process by applying avoidance and mitigation measures to the identified effects on each site to determine whether there will be adverse effects on integrity; and
- ▶ **Chapter Twelve:** presents consultation arrangements and concludes the document.

2 The City Centre Action Plan

2.1 Character and Geography of the City

- 2.1.1 Southampton is a major port city situated on the south coast of England, located approximately halfway between Bournemouth and Portsmouth. Covering an area of 51.8km², it is positioned at the northernmost point of Southampton Water and is crossed by the River Itchen, which divides the city into two parts. The 2011 Census¹ suggests that Southampton is a city of 236,882, which provides for many more in the sub-region through its shops, jobs and services.
- 2.1.2 The City is well connected by transport infrastructure, which includes arterial routes to London and the Midlands via the M271 and M3 or mainline railway, as well as south coast connections via the M27 / A27 and coastal rail services. Southampton International Airport is located just outside the City at Eastleigh, while its passenger and container terminal ports are among the busiest in the country. Ferry services are operated between the mainland and Isle of Wight, as well as cross-Solent ferries to Hythe.
- 2.1.3 The largest demographic groups are the 30-44 (20.6%) and the 45-59 (16.2%) year old ranges². Southampton is a regional centre for learning and innovation, and is also home to the National Oceanography Centre, a teaching hospital and the Maritime and Coastguard Agency. The City is recognised as a centre of world-class maritime expertise and is a regional centre for leisure, retail, theatre, arts, media, sports and events.
- 2.1.4 In the last 15 years parts of Southampton have been transformed; recent development in the City include the West Quay shopping centre, St Marys football stadium and Centenary Quay (at Woolston Riverside), and new city centre housing developments, including at Above Bar and Ocean Village. During this period the economy of the City has diversified and changed from a predominantly manufacturing base to a service economy.
- 2.1.5 The city is situated within an area noted for its high quality environment. As well as being located close to the New Forest National Park and South Downs National Park, Southampton has a number of designated sites of international and national nature conservation importance within it or nearby. These include the River Itchen Special Area of Conservation and Site of Special Scientific Interest (SSSI), the Solent and Southampton Water Special Protection Area and Ramsar site, the River Test and Lower Test Valley SSSIs, Lee-on-the Solent to Itchen Estuary SSSI, Southampton Common SSSI, and the Solent Maritime SAC.
- 2.1.6 The City Centre itself extends to 343ha and is bounded by the Rivers Test and Itchen and the docks. It is located on a broad peninsula of higher ground that slopes towards the River Test. Large areas of land to the west were reclaimed in the early 20th century originally for the port but now in a variety of industrial and retail uses. To the east, the centre stretches to the River

¹ ONS 2011 Census Key Statistics: *Key Figures*. Accessed online [28/2/13] at: <http://neighbourhood.statistics.gov.uk>

² ONS 2011 Census Key Statistics: *Age Structure*. Accessed online [28/2/13] at: <http://neighbourhood.statistics.gov.uk>

Itchen, and there are residential communities at Ocean Village and Chapel with industrial estates and aggregates and waste wharfs along the river itself. Eastward transport connections are provided via the Itchen and Northam bridges.

- 2.1.7 The core of the commercial City Centre is found at Bargate and Above Bar, most of which was developed during post-war reconstruction. Above Bar is partially pedestrianized. The market place is to the south of the Bargate. The focus for retailing is the West Quay Shopping Centre, completed in 2000, which has become one of the largest and busiest centres in the country, and links through to Above Bar. The railway station is located to the west of the centre. To the south are industrial estates with showrooms, warehousing and the Leisureworld entertainment complex, with the Western Docks beyond.
- 2.1.8 In the north of the centre is the Civic and Cultural quarter centred on the 1930s civic complex. The quarter has recently been extended to create new cultural uses and Guildhall Square providing routes through to the City Parks. The City Parks are an important feature of the City Centre and major destinations in the City. The parks are busy with activity and crossed by major pedestrian routes linking the east, west and north of the City Centre.
- 2.1.9 The waterfront to Southampton Water remains mostly in port operational uses, with access limited to the Royal Pier head, and Town Quay and Mayflower Park which are sandwiched between the Western and Eastern Docks. Royal Pier itself is now derelict but is an important roosting site for wading birds.
- 2.1.10 The City Centre also contains several residential communities. Old Town and Ocean Village are predominantly high quality, prosperous communities with modern housing. Neighbourhoods at Chapel, Holyrood and St Mary's in contrast are relatively deprived residential communities. The Bevois and Bargate wards (which contains parts of Holyrood and St Marys) are the most deprived community within Southampton.

2.2 The City Centre Action Plan

- 2.2.1 The Core Strategy for the City was adopted in January 2010, and forms the principal document within the Local Development Framework. It contains strategic policies and development principles for the city, and provides broad locations for development and regeneration across the range of land uses. Core Strategy policy CS1 'City Centre Approach' sets the objectives for the area, setting out the proposals for development, highlighting specific initiatives for the City Centre, and describing the role of City Centre Action Plan in taking forward the spatial strategy for the area. CS1 states that development in the City Centre will include:
- ▶ A major development quarter (MDQ) in the west of the City Centre and a wide range of other development sites;
 - ▶ Approximately 130,000 square metres (gross) of comparison retail floorspace;
 - ▶ At least 320,000 square metres (net) of office floorspace;
 - ▶ Further leisure / cultural / hotel development, for example: restaurants, bars, cinema, events arena, cultural quarter and events to attract visitors; and

- ▶ Approximately 5,450 dwellings.

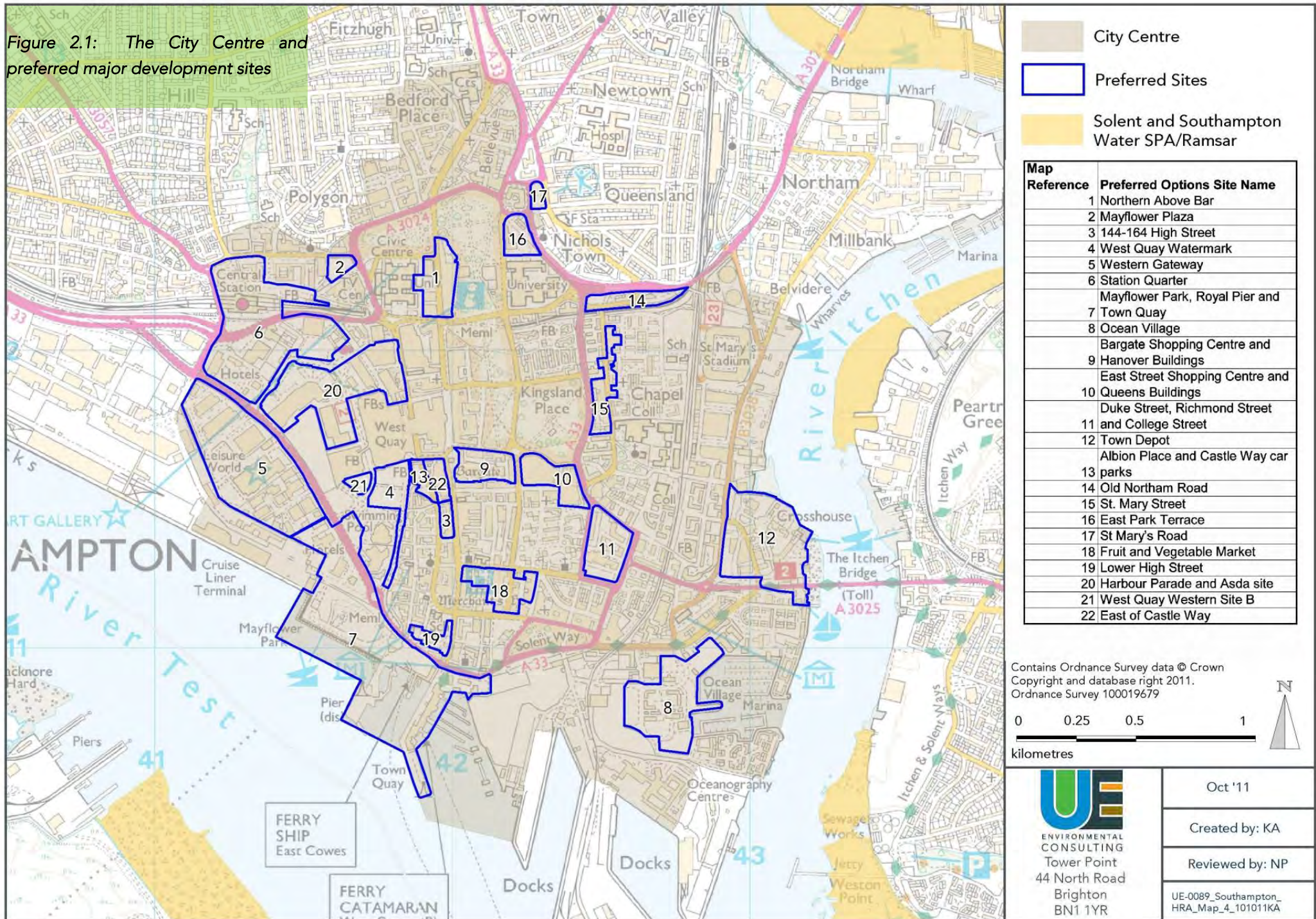
- 2.2.2 However, since the economic downturn both the sub-regional target for employment floorspace development and the actual rate of delivery within Southampton have decreased. On this basis the current expectation is that a net addition of approximately 110,000sqm of office development could be delivered in the City Centre between 2006 and 2026. The figure assumes 169,000sqm could be gained through development, while 59,000sqm would be lost through redevelopment or change to other uses. The retail floorspace target has also reduced in a similar way, from the 130,000sqm (gross) proposed in the Core Strategy to 100,000sqm (gross) as now contained in the CCAP.
- 2.2.3 The City Centre retains the physical capacity to accommodate significantly more than 110,000sqm of office growth. If economic growth is stronger and the recovery quicker than currently anticipated, the level of office delivery in the City Centre could be higher. The Core Strategy and CCAP therefore aim for at least 110,000sqm of office floorspace over the plan period. The necessary changes to the Core Strategy are being made through a Partial Review which is being consulted on in tandem with the CCAP, and is also supported by a Habitats Regulations Assessment.
- 2.2.4 Further detailed proposals on the MDQ are set out in Core Strategy Policy C2 'Major Development Quarter', which contains proposals for this strategic site in the western part of the City Centre area. The policy identifies the MDQ as a site for major commercial intensification, as part of a comprehensive high density mixed use scheme across the whole quarter. The quarter includes part of the existing primary shopping area, and the focus of development will be to build on its current functions, facilitating a coherent expansion of retail development, together with new office sites, and a mix of additional uses to include leisure, hotel, cultural and tourist uses and some residential and associated community uses.
- 2.2.5 The CCAP will provide further guidance on the phasing, layout and extent of expansion, in order to meet the objectives identified for the City Centre area as a whole, including the MDQ. The purpose of the CCAP is therefore to coordinate development, directing it to the most suitable areas within the City Centre and ensuring it is of the right type and quality, and is supported by the necessary infrastructure. Development of the CCAP has been informed by an independently prepared masterplan (David Lock Associates, 2011).
- 2.2.6 The City Centre Action Plan's policy proposals are listed in **Table 2.1**; full details can be viewed in the CCAP Proposed Submission Document itself. The extent of the City Centre and the preferred major development sites are shown in **Figure 2.1**.

Table 2.1: City Centre Action Plan proposed policies

Policy title	
Cross-cutting policies	
1	New office development
2	Existing offices
3	Safeguarding industrial sites
4	The Port of Southampton
5	Supporting existing retail areas
6	Extension of the Primary Shopping Area
7	Convenience retail
8	The night time economy
9	Housing supply
10	Supporting primary and secondary education facilities
11	Supporting higher and further education facilities
12	Green infrastructure and open space
13	Open space in new developments
14	Renewable or low carbon energy plants
15	Flood resilience
16	Design
17	Tall buildings
18	Transport and movement
19	Streets and spaces
Development sites	
20	Major Development Quarter: structure, improved links and spaces
21	Major Development Quarter: other issues
22	Major Development Quarter: Station Quarter
23	Major Development Quarter: Western Gateway
24	Mayflower Park and Royal Pier
25	East Street Centre and Queens Buildings
26	Major Development Quarter: North of West Quay Road
27	Town Depot
28	Fruit & Vegetable Market
29	Bargate sites (East of Castle Way, Bargate Shopping Centre and Hanover Buildings)
30	Albion Place and Castle Way car parks

Policy title	
31	144-164 High Street
32	Northern Above Bar
33	East Park Terrace
34	St Mary's Road
35	Dukes Street, Richmond Street and College Street
36	Ocean Village
37	St Mary's Street and Northam Road

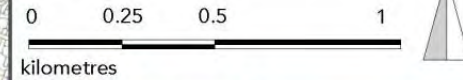
Figure 2.1: The City Centre and preferred major development sites



- City Centre
- Preferred Sites
- Solent and Southampton Water SPA/Ramsar

Map Reference	Preferred Options Site Name
1	Northern Above Bar
2	Mayflower Plaza
3	144-164 High Street
4	West Quay Watermark
5	Western Gateway
6	Station Quarter
7	Mayflower Park, Royal Pier and Town Quay
8	Ocean Village
9	Bargate Shopping Centre and Hanover Buildings
10	East Street Shopping Centre and Queens Buildings
11	Duke Street, Richmond Street and College Street
12	Town Depot
13	Albion Place and Castle Way car parks
14	Old Northam Road
15	St. Mary Street
16	East Park Terrace
17	St Mary's Road
18	Fruit and Vegetable Market
19	Lower High Street
20	Harbour Parade and Asda site
21	West Quay Western Site B
22	East of Castle Way

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3 European Site Information

3.1 Introduction

3.1.1 Each European site has its own intrinsic qualities, besides the habitats or species for which it was designated, that enable the site to support the ecosystems that it does. This is represented by the site's functionality at the landscape ecology scale; how the site interacts with the zone of influence of its surroundings. Hence the ecological integrity of a European site is vulnerable to change from natural and human induced activities in the surrounding environment. This is particularly the case where developments generate water- or air-borne pollutants, use water resources or otherwise affect water levels, or involve an extractive or noise emitting use. Adverse effects may also occur via impacts to mobile species occurring outside of a designated site but which are qualifying features of the site. For example, there may be effects on protected birds that use land outside the designated site for foraging, feeding or roosting.

3.1.2 European sites in and around Southampton that may be vulnerable to changes emanating from developments within the city are listed below and depicted on **Figure 3.1** and **Figure 3.2**.

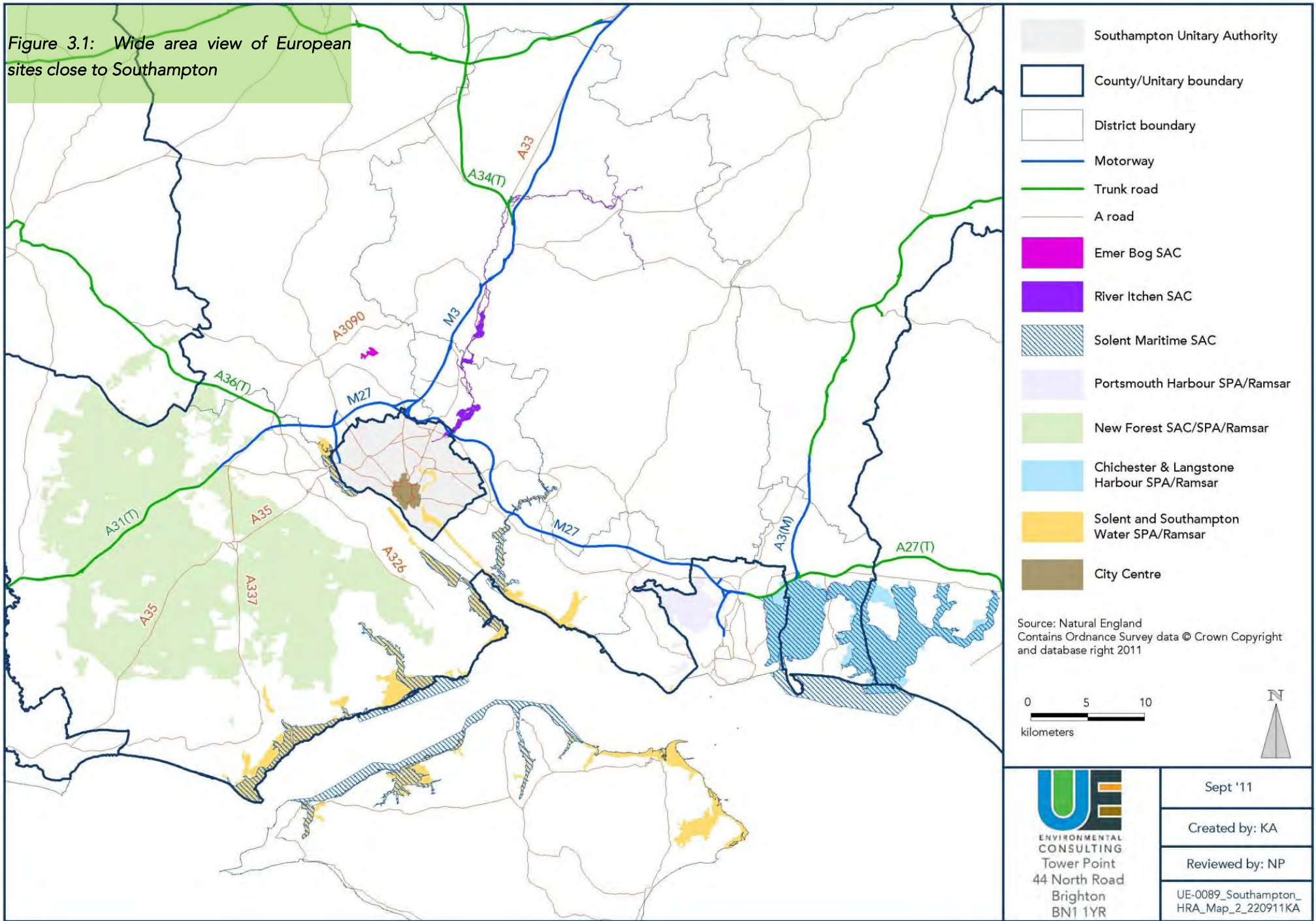
- ▶ Chichester and Langstone Harbours SPA / Ramsar;
- ▶ Emer Bog SAC;
- ▶ New Forest SAC / SPA / Ramsar;
- ▶ Portsmouth Harbour SPA / Ramsar;
- ▶ River Itchen SAC;
- ▶ Solent Maritime SAC; and
- ▶ Solent and Southampton Water SPA / Ramsar.

3.1.3 These sites were also considered by the Core Strategy's HRA which did not find any likely significant effects as a result of the plan's proposals, but highlighted a number of areas where effects were uncertain and precautionary mitigation should be provided. In order to help resolve this uncertainty, the first stage in the CCAP's HRA was to conduct a wide-ranging review of available baseline data to be used in support of the assessment. This is presented in the Baseline Evidence Review Report (UE Associates, 2011) which should be referred to alongside this document.

3.2 Ecological Information about the European Sites

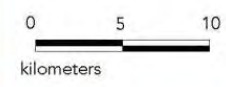
3.2.1 An ecological description for each European site is given in the Baseline Evidence Review Report, together with the sites' qualifying features, conservation objectives and known environmental conditions that support site integrity. Readers are referred to that document for further details, however, the sites' qualifying features are reproduced in **Table 3.1** for clarity.

Figure 3.1: Wide area view of European sites close to Southampton



- Southampton Unitary Authority
- County/Unitary boundary
- District boundary
- Motorway
- Trunk road
- A road
- Emer Bog SAC
- River Itchen SAC
- Solent Maritime SAC
- Portsmouth Harbour SPA/Ramsar
- New Forest SAC/SPA/Ramsar
- Chichester & Langstone Harbour SPA/Ramsar
- Solent and Southampton Water SPA/Ramsar
- City Centre

Source: Natural England
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Figure 3.2: Near area view of European sites close to Southampton

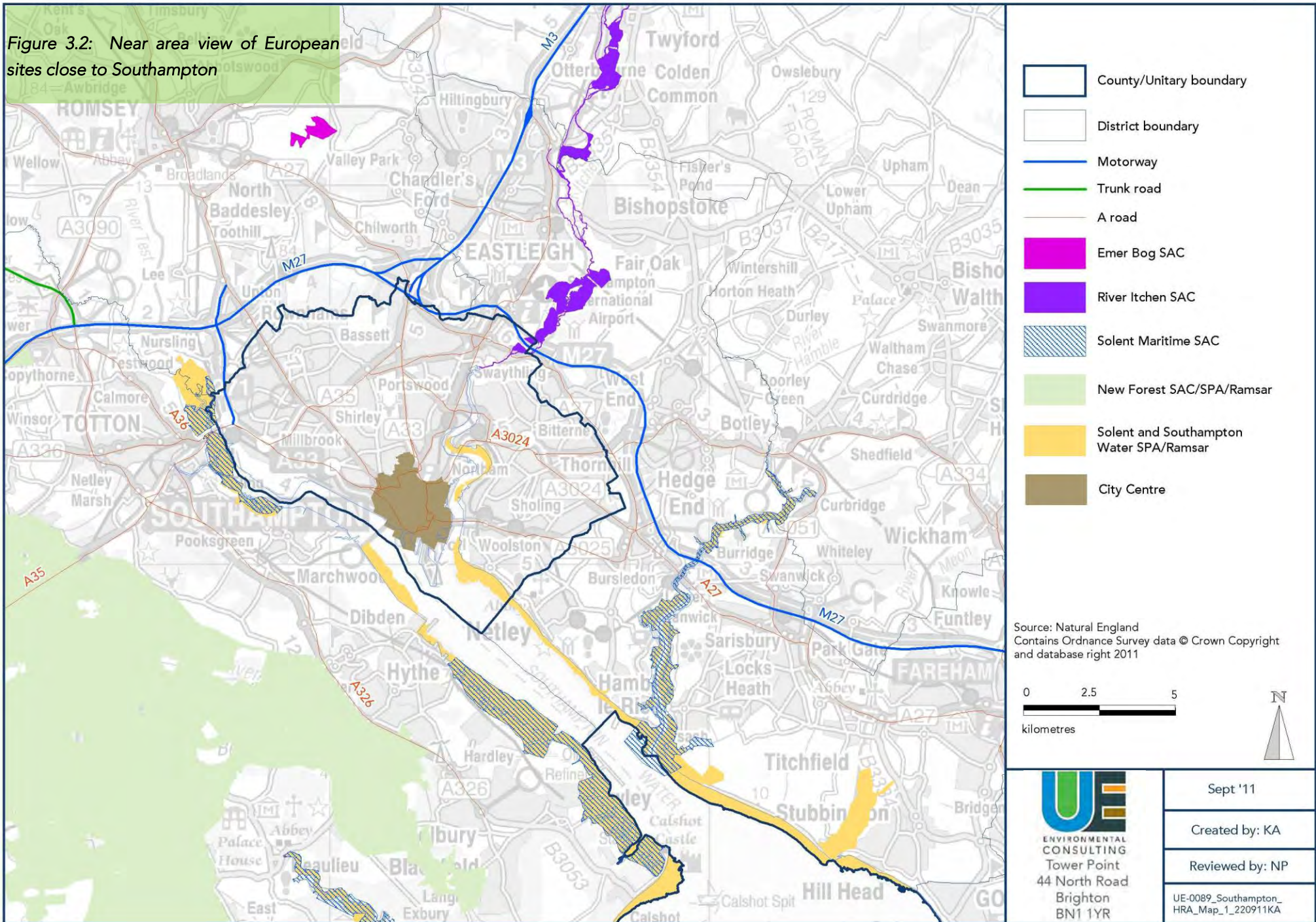


Table 3.1: The qualifying features of European sites close to Southampton

Solent & Southampton Water SPA	Solent & Soton Water Ramsar	Chichester & Langstone SPA	Chichester & Langstone Ramsar
<p>Breeding</p> <ul style="list-style-type: none"> - Little Tern <i>Sterna albifrons</i> - Sandwich Tern <i>Sterna sandvicensis</i> - Common Tern <i>Sterna hirundo</i> - Mediterranean Gull <i>Larus melanocephalus</i> - Roseate Tern <i>Sterna dougallii</i> <p>Overwintering</p> <ul style="list-style-type: none"> - Black-tailed Godwit <i>Limosa limosa islandica</i> - Dark-bellied Brent Goose <i>Branta bernicla bernicla</i> - Ringed Plover <i>Charadrius hiaticula</i> - Teal <i>Anas crecca</i> <p>Bird Assemblage</p> <ul style="list-style-type: none"> - Over winter the area regularly supports 51,361 individual waterfowl (5 year peak mean 1998) 	<p>Criterion 1</p> <ul style="list-style-type: none"> - Several outstanding wetland habitat types, including unusual double tidal flow, a major sheltered channel, saline lagoons, saltmarshes, estuaries, intertidal flats, shallow coastal waters, grazing marshes, reedbeds, coastal woodland and rocky boulder reefs <p>Criterion 2</p> <ul style="list-style-type: none"> - Nationally rare species assemblage <p>Criterion 5</p> <ul style="list-style-type: none"> - Winter assemblage of 51,343 waterfowl (5 year peak mean 02/03) <p>Criterion 6</p> <p>Breeding</p> <ul style="list-style-type: none"> - Sandwich Tern <i>Sterna sandvicensis</i> - Common Tern <i>Sterna hirundo</i> - Little Tern <i>Sterna albifrons</i> - Roseate Tern <i>Sterna dougallii</i> <p>Overwintering</p> <ul style="list-style-type: none"> - Black-tailed Godwit <i>Limosa limosa islandica</i> - Dark-bellied Brent Goose <i>Branta bernicla bernicla</i> - Teal <i>Anas crecca</i> 	<p>Breeding</p> <ul style="list-style-type: none"> - Little Tern <i>Sterna albifrons</i> - Common Tern <i>Sterna hirundo</i> - Sandwich Tern <i>Sterna sandvicensis</i> <p>Overwintering</p> <ul style="list-style-type: none"> - Bar-tailed Godwit <i>Limosa lapponica</i> - Pintail <i>Anas acuta</i> - Shoveler <i>Anas clypeata</i> - Eurasian Teal <i>Anas crecca</i> - Wigeon <i>Anas penelope</i> - Turnstone <i>Arenaria interpres</i> - Dark-bellied Brent Goose <i>Branta bernicla bernicla</i> - Sanderling <i>Calidris alba</i> - Dunlin <i>Calidris alpina alpina</i> - Ringed Plover <i>Charadrius hiaticula</i> - Red-breasted Merganser <i>Mergus serrator</i> - Eurasian Curlew <i>Numenius arquata</i> - Grey Plover <i>Pluvialis squatarola</i> - Shelduck <i>Tadorna tadorna</i> - Redshank <i>Tringa totanus</i> <p>Bird Assemblage</p> <ul style="list-style-type: none"> - Over winter the area regularly supports 93,230 individual waterfowl (5yr peak mean 	<p>Criterion 1</p> <ul style="list-style-type: none"> - Two outstanding estuarine basins, the site includes intertidal mudflats, saltmarsh, sand and shingle spits and sand dunes <p>Criterion 5</p> <ul style="list-style-type: none"> - Winter assemblage of 76,480 waterfowl (5 year peak mean 1998/99 - 2002/03) <p>Criterion 6</p> <p>Breeding</p> <ul style="list-style-type: none"> - Little Tern <i>Sterna albifrons albifrons</i> <p>Overwintering</p> <ul style="list-style-type: none"> - Dark-bellied Brent Goose <i>Branta bernicla bernicla</i> - Dunlin <i>Calidris alpina alpina</i> - Grey Plover <i>Pluvialis squatarola</i> - Common Shelduck <i>Tadorna tadorna</i> <p>On passage</p> <ul style="list-style-type: none"> - Ringed Plover <i>Charadrius hiaticula</i> - Black-tailed Godwit <i>Limosa limosa islandica</i> - Common Redshank <i>Tringa totanus totanus</i>

	<p><u>On passage</u></p> <ul style="list-style-type: none"> - Ringed Plover <i>Charadrius hiaticula</i> 	1998)	
Portsmouth Harbour SPA	Portsmouth Harbour Ramsar	River Itchen SAC	Solent Maritime SAC
<p><u>Overwintering</u></p> <ul style="list-style-type: none"> - Dark-bellied Brent Goose <i>Branta bernicla bernicla</i> - Dunlin <i>Calidris alpina alpina</i> - Black-tailed Godwit <i>Limosa limosa islandica</i> - Red-breasted Merganser <i>Mergus serrator</i> 	<p><u>Criterion 3</u></p> <ul style="list-style-type: none"> - <i>Species assemblage of importance to maintaining biogeographic biodiversity</i> <p><u>Criterion 6</u></p> <p><u>Overwintering</u></p> <ul style="list-style-type: none"> - Dark-bellied Brent Goose <i>Branta bernicla bernicla</i> 	<p><u>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>Annex II Species</u></p> <ul style="list-style-type: none"> - White-clawed (or Atlantic stream) crayfish <i>Austropotamobius pallipes</i> - Southern damselfly <i>Coenagrion mercuriale</i> - Bullhead <i>Cottus gobio</i> - Brook lamprey <i>Lampetra planeri</i> - Otter <i>Lutra lutra</i> - Atlantic salmon <i>Salmo salar</i>. 	<p><u>Annex I Habitat</u></p> <ul style="list-style-type: none"> - Estuaries - <i>Spartina</i> swards (<i>Spartinion maritimae</i>) - Atlantic salt meadows (<i>Glauco-Puccinellietalia maritimae</i>) - Sandbanks - slightly covered by sea water all the time - Mudflats and sandflats not submerged at low tide - Annual vegetation drift lines - Perennial vegetation of stony banks - <i>Salicornia</i> and other annuals colonising mud and sand - Shifting white dunes with <i>Ammophila arenaria</i> - Coastal lagoons <p><u>Annex II Species</u></p> <ul style="list-style-type: none"> - Desmoulin's whorl snail <i>Vertigo moulinsiana</i>
The New Forest SPA	The New Forest Ramsar	The New Forest SAC	Emer Bog SAC
<p><u>Breeding</u></p> <ul style="list-style-type: none"> - Nightjar <i>Caprimulgus europaeus</i> - Woodlark <i>Lullula arborea</i> - Honey Buzzard <i>Pernis apivorus</i> 	<p><u>Criterion 1</u></p> <p>Valley mires and wet heaths are found throughout the site and are of outstanding scientific interest. The mires and heaths are</p>	<p><u>Annex I Habitat</u></p> <ul style="list-style-type: none"> - Oligotrophic waters containing very few minerals of sandy plains (<i>Littorelletalia uniflorae</i>) 	<p><u>Annex I Habitat</u></p> <ul style="list-style-type: none"> - Transition mires and quaking bogs.

- Dartford Warbler *Sylvia undata*

Overwintering

- Hen Harrier *Circus cyaneus*

within catchments whose uncultivated and undeveloped state buffer the mires against adverse ecological change. This is the largest concentration of intact valley mires of their type in Britain

Criterion 2

Diverse assemblage of wetland plants and animals including several nationally rare species. Seven species of nationally rare plant are found on the site, as are at least 65 British Red Data Book species of invertebrate

Criterion 3

The mire habitats are of high ecological quality and diversity and have undisturbed transition zones. The invertebrate fauna of the site is important due to the concentration of rare and 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

- 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 *

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

- Transition mires and quaking bogs.

- Southern damselfly *Coenagrion mercuriale*

- Stag beetle *Lucanus cervus*

- Great crested newt *Triturus cristatus*

* Denotes priority feature

3.3 Conservation Objectives for SAC and SPA

3.3.1 The Habitats Directive requires that Member States maintain or where appropriate restore habitats and species populations of European importance to favourable conservation status. European site conservation objectives are referred to in the Habitats Regulations and Article 6(3) of the Habitats Directive. They are for use when there is a need to undertake an Appropriate Assessment under the relevant parts of the respective legislation. The conservation objectives are set for each feature (habitat or species) of an SAC/SPA. Where the objectives are met, the site can be said to demonstrate a high degree of integrity and the site itself makes a full contribution to achieving the aims of the Habitats and Birds Directives. The conservation objectives recently defined by Natural England for the SACs and SPAs included within the scope of this HRA are given in **Box 1**.

Box 1: Conservation objectives for SAC and SPA

Special Protection Areas

With regard to the individual species and/or assemblage of species for which the site has been classified;

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

Subject to natural change, to maintain or restore:

- ▶ 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 populations of the qualifying features;
- ▶ The distribution of the qualifying features within the site.

Special Areas of Conservation

With regard to the natural habitats and/or species for which the site has been designated;

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

Subject to natural change, to maintain or restore:

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

- 3.3.2 Regulation 102 requires that an Appropriate Assessment is made of the implications for each site in view of the site's conservation objectives. To make such an assessment, it is necessary to understand in more detail the features of the sites that contribute to their favourable condition or conservation status. Natural England has published detailed Favourable Condition Tables (FCT) in which various attributes of the habitat and species populations are defined for assessing site condition. These have been developed from the definition of Favourable Conservation Status provided in Article 1 of the Habitats Directive (**Box 2**).
- 3.3.3 For the populations of birds within the SPAs, favourable conservation status can be defined by reference to Article 1(i), and for the habitats within the SACs by reference to Article 1(e). Conservation objectives for the SPAs would therefore be:
- ▶ **Objective 1:** Maintain the population of each of the Annex 1 and migratory bird species as a viable component of their natural habitats on a long-term basis;
 - ▶ **Objective 2:** Maintain the range (geographic extent) of the population of each of the Annex 1 and migratory bird species for the foreseeable future; and
 - ▶ **Objective 3:** Maintain sufficient area of suitable habitat to maintain the populations of each of the Annex 1 and migratory bird species on a long term basis.
- 3.3.4 For the SAC habitats, the conservation objectives developed from the definition of favourable conservation status are:
- ▶ **Objective 4:** The geographical distribution of the habitats and their overall area within the sites should be maintained or increased;
 - ▶ **Objective 5:** The mix of species (their species structure) and the ecological inter-relationships between these and other environmental and management factors (ecological function) which are needed for the long-term maintenance of the habitats should be likely to continue to exist; and
 - ▶ **Objective 6:** The conservation status of the habitats' typical species are maintained in terms of their population size, range and habitat extent.
- 3.3.5 Some of the typical species of each Annex 1 habitat are listed in **Table 3.2**. These are derived from a combination of sources, including the Joint Nature Conservation Committee (JNCC) Annex 1 habitat accounts³, the *Interpretation Manual of European Union Habitats* (EC, 2007) and English Nature's (now Natural England) standing advice for the Solent European Marine Sites (2001).

3.4 Conservation Objectives for Ramsar Sites

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

³ JNCC Annex 1 Habitat Accounts [accessed 13/10/11]: http://jncc.defra.gov.uk/ProtectedSites/SACselection/SAC_habitats.asp

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

Box 2: Extract from Managing Natura 2000 Sites (EC, 2000)

Conservation status is defined in Article 1 of the Habitats Directive. For a natural habitat, Article 1(e) specifies that it is: *'the sum of the influences acting on a natural habitat and its typical species that may affect its long-term natural distribution, structure and functions as well as the long-term survival of its typical species ...'*.

For a species, Article 1(i) specifies that it is: *'the sum of the influences acting on the species concerned that may affect the long-term distribution and abundance of its population ...'*

The Member State has therefore to take into account all the influences of the environment (air, water, soil, territory) which act on the habitats and species present on the site.

Favourable conservation status is also defined by Article 1(e) for natural habitats and Article 1(i) for species.

For a **natural habitat**, it occurs when:

- *'its natural range and areas it covers within that range are stable or increasing;*
- *the specific structure and functions which are necessary for its long-term maintenance exist and are likely to continue to exist for the foreseeable future; and*
- *the conservation status of its typical species is favourable'.*

For a **species**, it occurs when:

- *'the population dynamics data on the species concerned indicate that it is maintaining itself on a long-term basis as a viable component of its natural habitats;*
- *the natural range of the species is neither being reduced nor is likely to be reduced for the foreseeable future; and*
- *there is, and will probably continue to be, a sufficiently large habitat to maintain its populations on a long-term basis'.*

The favourable conservation status of a natural habitat or species has to be considered across its natural range, according to Articles 1(e) and 1(i), i.e. at biogeographical and, hence, Natura 2000 network level. Since, however, the ecological coherence of the network will depend on the contribution of each individual site to it and, hence, on the conservation status of the habitat types and species it hosts, the assessment of the favourable conservation status at site level will always be necessary.

The conservation status of natural habitat types and species present on a site is assessed according to a number of criteria established by Article 1 of the Directive. This assessment is done both at site and network level.

Table 3.2: Some typical species of Annex 1 habitat types present within the SACs

SAC(s)	Annex 1 Habitat	Typical Species
River Itchen	Water courses of plain to montane levels with the <i>Ranunculion fluitantis</i> and <i>Callitriche-Batrachion</i> vegetation	Pond water-crowfoot <i>Ranunculus peltatus</i> , stream water-crowfoot <i>R. penicillatus</i> ssp. <i>pseudofluitans</i> , (a species especially characteristic of calcium-rich rivers), river water-crowfoot <i>R. fluitans</i> , southern damselfly <i>Coenagrion mercurial</i> , bullhead <i>Cottus gobio</i> , White-clawed crayfish <i>Austropotamobius pallipes</i> , Brook lamprey <i>Lampetra planeri</i> , Atlantic salmon <i>Salmo salar</i> , Otter <i>Lutra lutra</i>
Solent Maritime	Estuaries	Eelgrass <i>Zostera</i> spp., glasswort <i>Salicornia</i> spp., cord grass <i>Spartina</i> spp. and green algae <i>Ulva</i> spp., infaunal invertebrates, polychaete <i>Sabellaria spinulosa</i> , oyster <i>Ostrea edulis</i> , bass <i>Dicentrarchus labrax</i> , flatfish, mullet <i>Mugil</i> spp., salmon <i>Salmo salar</i> , sea trout <i>Salmo trutta</i> and eels <i>Anguilla</i> spp., gulls, terns, waders and wildfowl
	<i>Spartina</i> swards (<i>Spartinion maritimae</i>)	Smooth cord-grass <i>Spartina alterniflora</i> , small cord-grass <i>S. maritima</i> Townsend's cord-grass, <i>S. x townsendii</i> and common cord-grass <i>Spartina anglica</i> , waders and wildfowl
	Atlantic salt meadows (<i>Glauco-Puccinellietalia maritimae</i>)	Common sea lavender <i>Limonium vulgare</i> , sea purslane <i>Atriplex portulacoides</i> , thrift <i>Armeria maritime</i> , cord-grass <i>Spartina</i> spp., saltmarsh grasses <i>Puccinellia</i> spp., saltmarsh rush <i>Juncus gerardii</i> , fescues <i>Festuca</i> spp., wildfowl
	Sandbanks - slightly covered by sea water all the time	Subtidal eelgrasses <i>Zoostera</i> spp., worms, crustaceans, bivalve molluscs and echinoderms, shrimps, crabs prosobranch molluscs, fish and sandeels <i>Ammodytes</i> spp., waders, wildfowl and gulls
	Mudflats and sandflats not submerged at low tide	Intertidal eelgrasses <i>Zoostera</i> spp., green algae <i>Ulva</i> spp., marine polychaete worms (e.g. lugworm <i>Arenicola marina</i> , <i>Manayunkia aesturina</i>), crustaceans (e.g. sand hopper <i>Corophium volutator</i>), common cockle <i>Cerastoderma edule</i> , mussel <i>Mytilus edulis</i> , marine snail <i>Hydrobia ulvae</i> , fish, waders, gulls, wildfowl and terns
	Annual vegetation drift lines	Ephemeral and dynamic strandline communities including oraches <i>Atriplex</i> spp., sea beet <i>Beta vulgaris</i> ssp. <i>maritime</i> , sea sandwort <i>Honkenya peploides</i> , sea rocket <i>Cakile maritime</i> , <i>Tripleurospermum maritimum</i> , <i>Rumex crispus</i> , <i>Silene maritime</i> , <i>Senecio viscosus</i> and yellow-horned poppy <i>Glaucium flavum</i> , waders, gulls and terns
	Perennial vegetation of stony banks	Broom <i>Cytisus scoparius</i> , thrift <i>Armeria maritime</i> , sea campion <i>Silene uniflora</i> , <i>Rumex crispus</i> , waders, gulls terns
<i>Salicornia</i> and other annuals colonising mud and sand	Glasswort <i>Salicornia</i> spp., annual sea-blite <i>Suaeda maritime</i> , yellow horned-poppy <i>Glaucium flavum</i> and the rare sea-kale <i>Crambe maritima</i> and sea pea <i>Lathyrus japonicus</i>	

SAC(s)	Annex 1 Habitat	Typical Species
	Shifting white dunes with <i>Ammophila arenaria</i>	Sand-binding marram <i>Ammophila arenaria</i> , sea sandwort <i>Honckenyia peploides</i> , sand couch <i>Elytrigia juncea</i> , moss <i>Tortula ruralis</i> ssp. <i>ruraliformis</i>
	Coastal lagoons	Foxtail stonewort <i>Lamprothamnium papulosum</i> , lagoon sand shrimp <i>Gammarus insensibilis</i> and starlet sea anemone <i>Nematostella vectensis</i>
New Forest	Oligotrophic waters containing very few minerals of sandy plains (<i>Littorelletalia uniflorae</i>)	Shoreweed <i>Littorella uniflora</i> , bog orchid <i>Hammarbya paludosa</i> and floating bur-reed <i>Sparganium angustifolium</i> , Hampshire-purslane <i>Ludwigia palustris</i> , great crested newt <i>Triturus cristatus</i>
	Oligotrophic to mesotrophic standing waters with vegetation of the <i>Littorelletea uniflorae</i> and/or of the <i>Isoëto-Nanojuncetea</i>	Toad rush <i>Juncus bufonius</i> , coral-necklace <i>Illecebrum verticillatum</i> and yellow centaury <i>Cicendia filiformis</i> , allseed <i>Radiola linoides</i> and chaffweed <i>Anagallis minima</i> , great crested newt <i>Triturus cristatus</i>
	North Atlantic wet heaths with <i>Erica tetralix</i>	Cross-leaved heath <i>Erica tetralix</i> , <i>Sphagnum compactum</i> , deer grass <i>Trichophorum cespitosum</i> , marsh gentian <i>Gentiana pneumonanthe</i> , bog myrtle <i>Myrica gale</i> and marsh clubmoss <i>Lycopodiella inundata</i> , blue-tailed damselfly <i>Ischnura pumilio</i> , small red damselfly <i>Ceriagrion tenellum</i> , southern damselfly <i>Coenagrion mercuriale</i>
	European dry heaths	Bell heather <i>Erica cinerea</i> , dwarf gorse <i>Ulex minor</i> , European stonechat <i>Saxicola rubicola</i> , tree pipit <i>Anthus trivialis</i> , hobby <i>Falco subbuteo</i> , reptiles (adder, common lizard, sand lizard, smooth snake), ants, bees and wasps
	<i>Molinia</i> meadows on calcareous, peaty or clayey-silt-laden soils (<i>Molinion caeruleae</i>)	Carnation sedge <i>Carex panicea</i> , common sedge <i>C. nigra</i> and yellow-sedge <i>C. viridula</i> ssp. <i>oedocarpa</i> , mat-grass <i>Nardus stricta</i> and petty whin <i>Genista anglica</i>
	Depressions on peat substrates of the <i>Rhynchosporion</i>	White beak-sedge <i>Rhynchospora alba</i> , marsh clubmoss <i>Lycopodiella inundata</i> , bog orchid <i>Hammarbya paludosa</i> oblong leaved sundew <i>Drosera intermedia</i> , round leaved sundew <i>Drosera rotundifolia</i> , bog asphodel <i>Narthecium ossifragum</i> , cranberry <i>Vaccinium oxycoccos</i> , brown mosses <i>Cratoneuron</i> spp. and <i>Scorpidium scorpioides</i>
	Atlantic acidophilous beech forests with <i>Ilex</i> and sometimes also <i>Taxus</i> in the shrublayer (<i>Quercion roburi-petraeae</i> or <i>Ilici-Fagenion</i>)	Beech <i>Fagus sylvatica</i> , epiphytic lichens and saproxylic invertebrates, stag beetle <i>Lucanus cervus</i>

SAC(s)	Annex 1 Habitat	Typical Species
	Asperulo-Fagetum beech forests	Beech <i>Fagus sylvatica</i> , spurge laurel <i>Daphne laureola</i> , white helleborine <i>Cephalanthera damasonium</i> , violet helleborine <i>Epipactis purpurata</i> , green-flowered helleborine <i>E. phyllanthes</i> and Italian lords-and-ladies <i>Arum italicum</i> , epiphytic lichens and saproxylic invertebrates, stag beetle <i>Lucanus cervus</i>
	Old acidophilous oak woods with <i>Quercus robur</i> on sandy plains	Oak <i>Quercus spp.</i> , beech <i>Fagus sylvatica</i> , epiphytic lichens and saproxylic invertebrates, stag beetle <i>Lucanus cervus</i>
	Bog woodland *	Downy birch <i>Betula pubescens</i> , grey willow <i>Salix cinerea</i> , alder <i>Alnus glutinosa</i> , <i>Sphagnum</i> mosses, yellow horned moth <i>Achlya flavicornis</i> , orange underwing moth <i>Archiearis parthenias</i>
	Alluvial forests with <i>Alnus glutinosa</i> and <i>Fraxinus excelsior</i> (<i>Alno-Padion</i> , <i>Alnion incanae</i> , <i>Salicion albae</i>) *	Alder <i>Alnus glutinosa</i> , ash <i>Fraxinus excelsior</i> , epiphytic lichens and saproxylic invertebrates
New Forest, Emer Bog	Transition mires and quaking bogs	White sedge <i>Carex curta</i> and bottle sedge <i>C. rostrata</i> , marsh cinquefoil <i>Potentilla palustris</i> , marsh St John's wort <i>Hypericum eloides</i> , small red damselfly <i>Ceriagrion tenellum</i>

4 Appropriate Assessment

4.1 Introduction

4.1.1 This chapter reviews and updates the findings of the HRA screening exercise for the CCAP, before going on to describe the Appropriate Assessment stage.

4.2 Findings of the Screening Stage

4.2.1 The Baseline Evidence Review Report examined a number of impact categories potentially resulting from CCAP proposals which could affect the European sites, including:

- ▶ Atmospheric pollution;
- ▶ Water demand;
- ▶ Loss or degradation of habitats;
- ▶ Flood risk management and potential mobilisation of contaminants;
- ▶ Flood risk and coastal squeeze;
- ▶ Effluent discharge;
- ▶ Recreational disturbance; and
- ▶ Collision risk, light pollution, noise and vibration.

4.2.2 For each impact, its current extent, the CCAP's potential contribution, and the European sites likely to be affected were explored. Data sources and any gaps were also identified.

4.2.3 Following consultation on the baseline, a screening exercise was carried out for the draft CCAP. In accordance with regulation 102(1) of the Habitats Regulations the purpose of the screening exercise was, acknowledging that the plan is not directly connected with or necessary to the management of any European site, to identify which elements of the CCAP are considered likely to lead to significant effects at a European site. The screening process found that significant effects were a likely outcome of the CCAP proposals in relation to:

- ▶ Atmospheric pollution;
- ▶ Flood risk management and potential mobilisation of contaminants;
- ▶ Recreational disturbance;
- ▶ Loss or degradation of a wader roost; and
- ▶ Collision risk, light pollution, noise and vibration.

4.2.4 Likely significant effects were identified for the following sites. The ways in which these effects are likely to manifest themselves are shown in **Appendix I**, which includes an updated screening matrix.

- ▶ Chichester and Langstone Harbours SPA / Ramsar;
- ▶ New Forest SAC / SPA / Ramsar;
- ▶ Portsmouth Harbour SPA / Ramsar;

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

4.2.5 Emer Bog was screened out because of its distance from the City Centre and because no major roads (which could carry traffic to/from the City Centre) pass within 200m of the site.

4.2.6 Coastal squeeze was not an expected outcome of the CCAP because its waterfront does not coincide with any European sites. Effluent discharge produced by the increased population associated with the CCAP was not considered likely to affect the sites because Millbrook waste water treatment works is estimated to have sufficient capacity to cope with increased volumes from City Centre development, although it is noted that each of the works serving Southampton City is limited in relation to the loading of nitrogen discharged in order to protect the integrity of the Habitat Directive designations within Southampton Water and the Solent. Water demand was not initially considered likely to affect the sites at the screening stage because Southern Water's Water Resource Management Plan identifies sufficient resources to supply projected population growth while also preparing for sustainable abstraction reductions on the River Itchen. Loss of Brent goose foraging habitat was not an expected outcome because there are no foraging sites in the CCAP area.

4.2.7 Natural England, the statutory agency for nature conservation, concurred with the majority of these findings in its consultation response to the screening stage. However, contrary to the initial screening findings described above, it also requested that an assessment be made of the CCAP's possible impact on the River Itchen SAC through increasing water demand. This was because alternative sources of drinking water supply that would enable reduced abstractions from the Itchen have not yet been confirmed despite the conclusions made within Southern Water's Water Resource Management Plan.

4.2.8 Both Natural England and the Wildlife Trust, the only other respondent to screening consultations, requested that proposals at Ocean Village (almost fully consented but not yet fully implemented) be assessed in combination with other proposals to ensure no impacts in relation to noise, vibration or mobilisation of contaminants. The Wildlife Trust requested that possible effects to wader and Brent goose sites on the east bank of the Itchen are considered.

4.3 The Appropriate Assessment Stage

4.3.1 The purpose of the Appropriate Assessment (HRA Stage AA2) is to further analyse likely significant effects identified during the screening stage, as well as those effects which were uncertain or not well understood and taken forward for assessment in accordance with the precautionary principle. The assessment should seek to establish whether or not the plan's effects, either alone or in combination with other plans or projects, will lead to adverse effects on site integrity, in view of the site's conservation objectives (see **Chapter 3**). Site integrity can be defined as follows (ODPM, 2005):

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

- 4.3.2 The assessment first focuses on the effects generated by the proposed policies of the CCAP and considers ways in which they can be avoided altogether. Where adverse effects cannot be avoided by changes to the plan, mitigation measures are introduced to remove or reduce the effects to the level of non-significance. Any residual (non-significant) effects can then be taken forward for further analysis to establish whether they might be expected to become significant in combination with the effects of other plans or projects.
- 4.3.3 The assessments presented in the following chapters are comprised of the following main sections:
- ▶ Baseline conditions: existing conditions within the site in relation to the impact being assessed.
 - ▶ Impact source: proposals within the plan that cause the effect;
 - ▶ Impact pathway: the mechanisms through which the proposed action may adversely affect certain qualifying features;
 - ▶ Offsetting measures within the plan: proposals that aim to avoid and/or reduce the effect; and
 - ▶ Impact assessment: analysis of the plan's effects on conservation objectives.
- 4.3.4 Each chapter concludes by proposing further recommendations for avoidance and mitigation measures where required, and consideration of residual and in combination effects. The recommendations provide avoidance measures in the first instance, intended to remove the effects, and these are further supported by mitigation measures where necessary to ensure the effects of the plan can successfully be eliminated.
- 4.3.5 The impacts addressed by the Appropriate Assessment are of two distinct types. Firstly, there are strategic effects that operate sub-regionally. In this case the CCAP is considered likely to contribute to the impact, as will other development plans and projects across the sub-region. The impact may affect several different sites in similar ways and demands a sub-regional response. In order to avoid repetition, European sites subject to a strategic effect are addressed collectively.
- 4.3.6 Secondly, there are site-specific impacts. These are more dependent on the location, type and method of development, and it should be possible to avoid or mitigate the effect locally. Such impacts are dealt with on a site by site basis.

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5 Atmospheric Pollution

5.1 Baseline Conditions

- 5.1.1 Atmospheric pollution is a widespread issue, with background air quality heavily influenced by large point-source emitters including transboundary sources. Local pollutant sources are expected to affect the New Forest, River Itchen and Solent Maritime sites, particularly in relation to habitats of the SAC (and New Forest Ramsar), and especially from road traffic emissions. The City Centre Action Plan cannot feasibly influence causes of background pollution such as large point sources but, through its spatial distribution of development and sustainable transport measures, may affect the way in which locally emitted pollutants reach the sites.
- 5.1.2 The main pollutant effects of interest are acid deposition and eutrophication by nitrogen deposition. The following brief descriptions draw on information presented through the Air Pollution Information System⁴ (APIS).
- 5.1.3 Acid deposition: caused by oxides of nitrogen (NO_x) (or sulphur dioxide) reacting with rain/cloudwater to form nitric (or sulphuric) acid, and is caused primarily by energy generation, as well as road traffic and industrial combustion. Both wet and dry acid deposition have been implicated in the damage and destruction of vegetation (heather, mosses, liverworts and lichens are particularly susceptible to cell membrane damage due to excessive pollutant levels) and in the degradation of soils and watercourses (including acidification and reduced microbial activity).
- 5.1.4 Eutrophication by nitrogen deposition: consists of the input of nitrogen from NO_x (and sometimes ammonia) emissions by deposition, and is caused primarily by road traffic, as well as energy generation, industrial combustion and agricultural practices. Nitrogen deposition can cause direct damage to heather, mosses, liverworts and lichens, as well as other plant species, because of their sensitivity to additional atmospheric nitrogen inputs, whilst deposition can also lead to long term compositional changes in vegetation and reduced diversity. For example a marked decline in heather and an increased dominance of grasses have been observed throughout the Netherlands and also in the East Anglian Brecklands (see for example Bobbink *et al* (1993) and Pitcairn *et al* (1991)).
- 5.1.5 Furthermore, while plants are able to detoxify and assimilate low exposure to atmospheric concentrations of NO_x, high levels of uptake can lead to detrimental impacts including:
- ▶ Inhibition of pigment biosynthesis, leading to reduced rates of photosynthesis;
 - ▶ Water soaking as NO₂ molecules attach to lipids in membranes, causing plasmolysis (removal of water) and eventually necrosis;
 - ▶ Inhibition of lipid biosynthesis, leading to reduced rates of regeneration and growth;

⁴Online at: <http://www.apis.ac.uk/index.html> [Accessed 25/7/11]

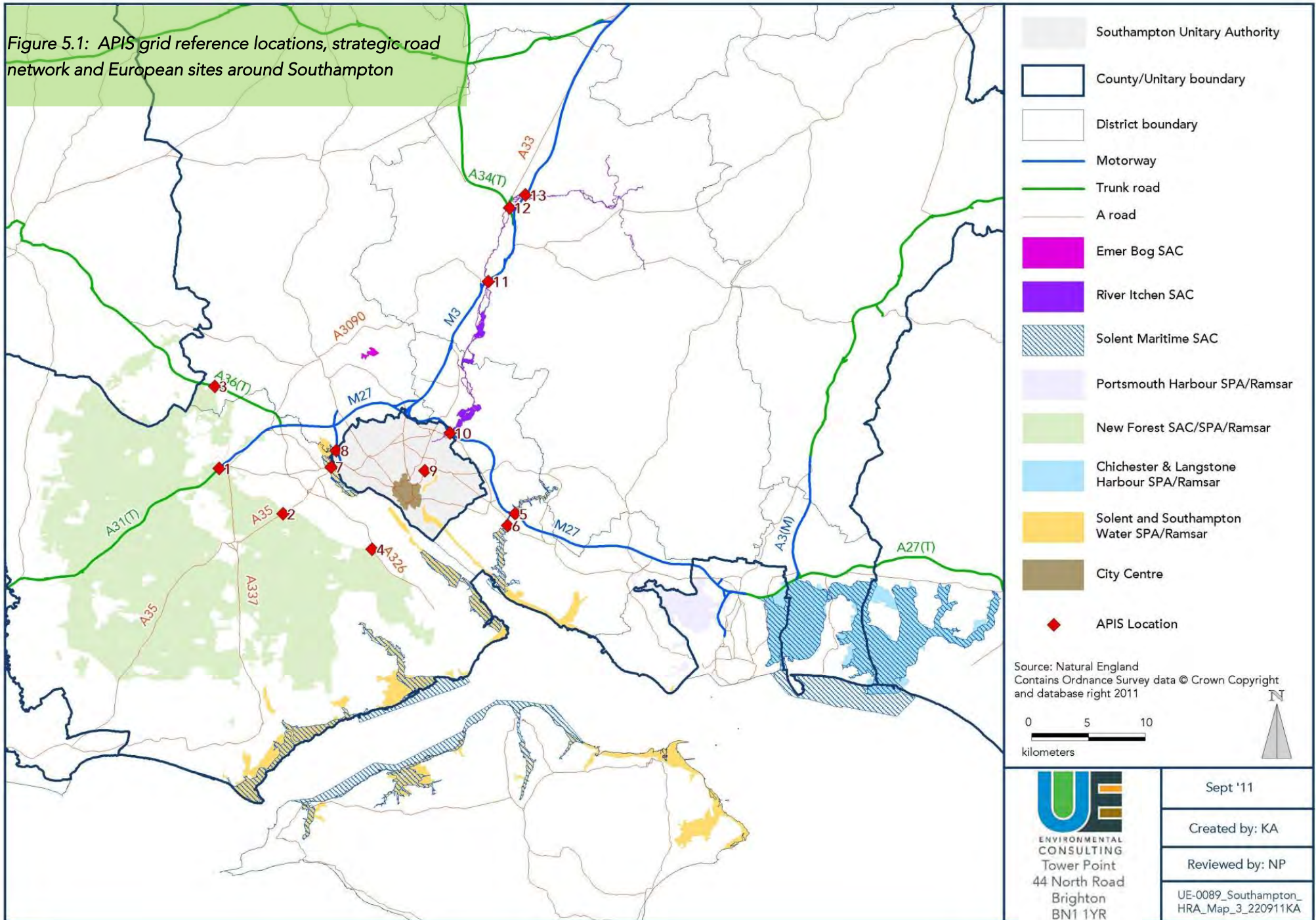
- ▶ Injury to mitochondria and plastids, essential to internal processing of energy and proteins;
- ▶ Decrease in stomatal conductance of air and water vapour; and
- ▶ Inhibition of carbon fixation (at least under low light levels).

- 5.1.6 A Partnership for Urban South Hampshire (PUSH) research report (AEAT, 2010) notes that the critical load or level for each of these pollutant classes is already exceeded or approaching exceedance at background locations, away from roads across large parts of the sub-region. Nilsson and Grennfelt (1988) define critical loads and levels as “a quantitative estimate of exposure to one or more pollutants below which significant harmful effects on specified sensitive elements of the environment do not occur according to present knowledge”. Critical loads concern the quantity of pollutants deposited from the air to the ground (for example nitrogen deposition and acid deposition), whilst critical levels concern the gaseous concentration of a pollutant in the air (for example nitrogen oxides).
- 5.1.7 The Baseline Evidence Review Report presented the latest data available through APIS on background critical load/level exceedances for these key pollutants types, and this was reproduced in the screening statement. A selection of grid references on or close to the road network connecting to Southampton City Centre were chosen to interrogate APIS (**Figure 5.1**); beyond 200m effects from road sources diminish to the equivalent of background levels (Laxen & Wilson (2002), DfT (2005)). For each grid reference, the actual and critical load/level was obtained for acid deposition, nutrient deposition and NO_x in relation to a representative qualifying habitat type, or closest available match thereto. A summary of the APIS returns is presented in **Table 5.1** (data is the latest available: 2005-2008).
- 5.1.8 The extent of exceedances over a wide geographic area points to the significance of multiple sources contributing to atmospheric pollution. Motorway and A-roads in the sub-region are already very busy, carrying traffic to and from a multitude of locations. Insofar as the CCAP could add to already high volumes of traffic, these findings suggest that additional sources of pollutants generated as a result of proposals in the plan should be avoided or mitigated to prevent additional adverse effects on ecological integrity, while it would be beneficial to explore opportunities to improve baseline conditions.
- 5.1.9 It should be noted that one grid reference much closer to the City Centre area was used to interrogate the APIS database. Grid reference 9 is adjacent to A3024 Northam Bridge within Solent and Southampton Water SPA/Ramsar. The latest condition assessment for Lee-on-the-Solent to Itchen Estuary SSSI (the SPA/Ramsar’s coincident SSSI) from January 2010 finds the site in favourable condition and makes no reference to air pollution.

5.2 Impact Source

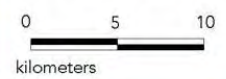
- 5.2.1 The screening exercise found that, through their residential, employment or retail elements, proposed policies 1, 6, 9, 22, 23, 24, 25, 26, 27, 28, 29, 31, 32, 33, 34, 35, 36 and 37 were likely to add to traffic related emissions to a greater or lesser extent.

Figure 5.1: APIS grid reference locations, strategic road network and European sites around Southampton



- Southampton Unitary Authority
- County/Unitary boundary
- District boundary
- Motorway
- Trunk road
- A road
- Emer Bog SAC
- River Itchen SAC
- Solent Maritime SAC
- Portsmouth Harbour SPA/Ramsar
- New Forest SAC/SPA/Ramsar
- Chichester & Langstone Harbour SPA/Ramsar
- Solent and Southampton Water SPA/Ramsar
- City Centre
- APIS Location

Source: Natural England
 Contains Ordnance Survey data © Crown Copyright
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UE
 ENVIRONMENTAL
 CONSULTING
 Tower Point
 44 North Road
 Brighton
 BN1 1YR

Sept '11
 Created by: KA
 Reviewed by: NP
 UE-0089_Southampton_
 HRA_Map_3_220911KA

Table 5.1: Summary of exceedances reported by APIS

Summary of exceedances reported by APIS	
New Forest SAC/Ramsar	Exceedance(s): *
Grid ref. 1: M27/A31 Cadnam Queried habitat: Lowland heathland	Nutrient deposition (max=4.1 kgN/ha/yr) Acid deposition (max=0.55 keq/ha/yr)
Grid ref. 2: A35 Ashurst Queried habitat: Lowland heathland	Nutrient deposition (max=5.4 kgN/ha/yr)
Grid ref. 3: A36 West Wellow Queried habitat: Lowland heathland	Nutrient deposition (max=5.8 kgN/ha/yr) Acid deposition (max=0.68 keq/ha/yr)
Grid ref. 4: A326 Hythe Queried habitat: Lowland heathland	Nutrient deposition (max=2.5 kgN/ha/yr) Acid deposition (max=1.06 keq/ha/yr)
River Itchen SAC	Exceedance(s): *
Grid ref. 10: M27/A27 Woodmill Queried habitat: Lowland wood pastures	Nutrient deposition (max=20.2 kgN/ha/yr) NOx concentration (max=0.1 µg/m ⁻³) Acid deposition (max=2.2 keq/ha/yr)
Grid ref. 11: M3 Twyford Down Queried habitat: Lowland wood pastures	Nutrient deposition (max=23.7 kgN/ha/yr) Acid deposition (max=2.61 keq/ha/yr)
Grid ref. 12: A34 Headbourne Worthy Queried habitat: Lowland wood pastures	Nutrient deposition (max=24.3 kgN/ha/yr) Acid deposition (max=2.51 keq/ha/yr)
Grid ref. 13: M3 Easton Queried habitat: Lowland wood pastures	Nutrient deposition (max=22.3 kgN/ha/yr) Acid deposition (max=2.52 keq/ha/yr)
Solent & Southampton Water SPA/Ramsar	Exceedance(s): *
Grid ref. 9: A3024 Northam Bridge Queried habitat: Saltmarsh and grazing marsh	Nutrient deposition (max= - 9.5 kgN/ha/yr) NOx concentration (max= - 26.8 µg/m ⁻³)
Solent Maritime SAC	Exceedance(s): *
Grid ref. 5: M27 Bursledon Queried habitat: Saltmarsh	Acid deposition (max=0.7 keq/ha/yr)
Grid ref. 6: A27 Bursledon Queried habitat: Saltmarsh	NOx concentration (max=2.5 µg/m ⁻³) Acid deposition (max=0.51 keq/ha/yr)
Grid ref. 7: A35/A36 Totton Queried habitat: Saltmarsh	Acid deposition (max=0.62 keq/ha/yr)
Grid ref. 8: M271 Redbridge Queried habitat: Saltmarsh	Acid deposition (max=0.62 keq/ha/yr)

* Max= value of maximum exceedance.

5.3 Impact Pathway

5.3.1 Environment Agency H1 guidance (2010) explains that, regardless of the baseline environmental conditions, a process' contribution to atmospheric pollution (i.e. the CCAP's contribution) can be considered insignificant if: the long-term (annual mean) process contribution is <1% of the long-term environmental standard (critical load/level). This criterion is also used in guidance issued by the Agency and JNCC on applying the Habitats Regulations in relation to air quality impacts (Environment Agency, 2005) which states that:

Where the concentration within the emission footprint in any part of the European site is less than 1% of the relevant benchmark, the emission is unlikely to have a significant effect irrespective of the background levels.

5.3.2 The guidance further states that if the process contribution is >1% of the critical load/level and, when added to background pollution levels, the total predicted environmental concentration of a pollutant is >70% of the critical load/level, detailed assessment of atmospheric pollution effects would be required. At the time of the first iteration of this HRA, the data required to make an assessment of the CCAP's process contribution to atmospheric pollution were not available. Required data include the baseline and future year annual average daily traffic flow (AADT), together with vehicular composition and average speed, for road links within 200m of potentially affected European sites.

5.3.3 In response, the Council commissioned specific model runs within the South Hampshire Sub-regional Transport Model to explore potential future growth in traffic associated with the CCAP. Three model runs were carried out as follows:

- ▶ 2010 baseline;
- ▶ 2026 do minimum: planned development for the sub-region as described in the South Hampshire Strategy 2012, as well as development completions in Southampton between 2010 and 2014; and
- ▶ 2026 do something: as above, plus the full effect of CCAP development quanta.

5.3.4 Both the 2026 scenarios include predictions of modal shift to the extent that these will be a consequence of infrastructure developments that are already programmed and committed, but neither predicts further modal shift as a result of changes within Southampton City Centre.

5.3.5 Extracts from the results (AADT flows) are summarised in Table 5.2, where the link numbers correspond to the numbered locations illustrated on Figure 5.2. The upper half of the table shows traffic flow increases when the 2026 do something scenario is compared to the 2010 baseline, while the lower half of the table shows flow increases when the 2026 do something scenario is compared to the 2026 do minimum scenario. The results show some significant increases in traffic flow on links passing within 200m of European sites when the 2026 do something scenario is compared with the 2010 baseline. However, these increases represent the in combination effect of traffic growth associated with all planned development for south Hampshire. The growth in traffic flow attributable to development within Southampton forms a relatively small proportion of the overall increases – the right hand column of the table's upper half.

5.3.6 When the traffic flows of the 2026 do something scenario are compared with the 2026 do minimum scenario the increases are less substantial, both for the overall (in combination) increase and that attributable to Southampton City Centre. For example, the percentage traffic flow increase that is attributable to CCAP development on M27 J8-J9 (outbound) is 20.2%, falling to 12.7% on Redbridge Causeway (outbound), and 7.7% on M27 J5-J7 (outbound). This may be a more reasonable assessment to make given that the baseline will be progressing each year regardless of the developments that come forward in the City Centre, but the results still show some significant increases in traffic.

Table 5.2: Summary of SRTM model runs for CCAP

			2026 do something traffic flow (AADT) increases over 2010 baseline			
Link	Link Name		Full Demand (pcu)	Soton Demand (pcu)	Soton only % increase	Soton inc as % of Full inc
1	M27 (J1 - J2)	Outbound	9,207	603	41.4%	6.6%
1	M27 (J1 - J2)	Inbound	12,170	633	58.5%	5.2%
2	M27 (J5 - J7)	Outbound	11,894	-8	-23.9%	-0.1%
2	M27 (J5 - J7)	Inbound	12,124	-13	-98.1%	-0.1%
3	M3 (J10 - J11)	Outbound	14,980	2,055	81.6%	13.7%
3	M3 (J10 - J11)	Inbound	12,273	1,688	51.4%	13.8%
4	M27 (J8 - J9)	Outbound	17,112	938	48.5%	5.5%
4	M27 (J8 - J9)	Inbound	17,391	1,079	37.6%	6.2%
5	M271 (Redbridge Rndbt - J1)	Outbound	3,933	526	14.0%	13.4%
5	M271 (Redbridge Rndbt - J1)	Inbound	9,425	3,059	73.4%	32.5%
6	Redbridge Causeway	Outbound	5,878	2,094	29.3%	35.6%
6	Redbridge Causeway	Inbound	3,650	980	20.2%	26.9%
7	Northam River Bridge	Outbound	3,464	1,764	23.0%	50.9%
7	Northam River Bridge	Inbound	3,758	1,897	23.2%	50.5%
			2026 do something traffic flow (AADT) increases over 2026 do minimum			
Link	Link Name		Full Demand (pcu)	Soton Demand (pcu)	Soton only % increase	
1	M27 (J1 - J2)	Outbound	53	268	15.0%	
1	M27 (J1 - J2)	Inbound	16	250	17.1%	
2	M27 (J5 - J7)	Outbound	-376	2	7.7%	
2	M27 (J5 - J7)	Inbound	-329	0	-20.3%	
3	M3 (J10 - J11)	Outbound	303	829	22.1%	
3	M3 (J10 - J11)	Inbound	367	768	18.3%	
4	M27 (J8 - J9)	Outbound	173	482	20.2%	
4	M27 (J8 - J9)	Inbound	84	533	15.6%	
5	M271 (Redbridge Rndbt - J1)	Outbound	428	541	14.5%	
5	M271 (Redbridge Rndbt - J1)	Inbound	921	1,372	23.4%	
6	Redbridge Causeway	Outbound	686	1,040	12.7%	
6	Redbridge Causeway	Inbound	393	672	13.0%	
7	Northam River Bridge	Outbound	918	835	9.7%	
7	Northam River Bridge	Inbound	1,062	1,032	11.4%	

5.3.7 However, the model runs neither take account of planned transport interventions within Southampton to encourage modal shift, nor the actual capacity of the modelled links. Sections of the highway network have limited capacity for further traffic growth in the peak periods, which is likely to further encourage modal shift as well as leading to a degree of peak spreading. As a result, the outputs from SRTM modelling were compared to recent trends in travel demand and modal choice in the city to add further contextual data.

Location of Modelled SRTM Links in relation to European sites

- SRTM Modelled Links
- A Road
- B Road
- Motorway
- +— Railway
- Emer Bog
- New Forest
- River Itchen
- Solent Maritime
- Solent and Soton Water



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 Contains data from Natural England 2012

UE
 ENVIRONMENTAL
 CONSULTING
 Unit 5 Westergate
 Business Centre
 Brighton
 BN2 4QN

Scale 1: 100,297	Date June 2013
Created by NP	Reviewed by NP
Drawing number UE-0118_SRTM-Euro_20130611	

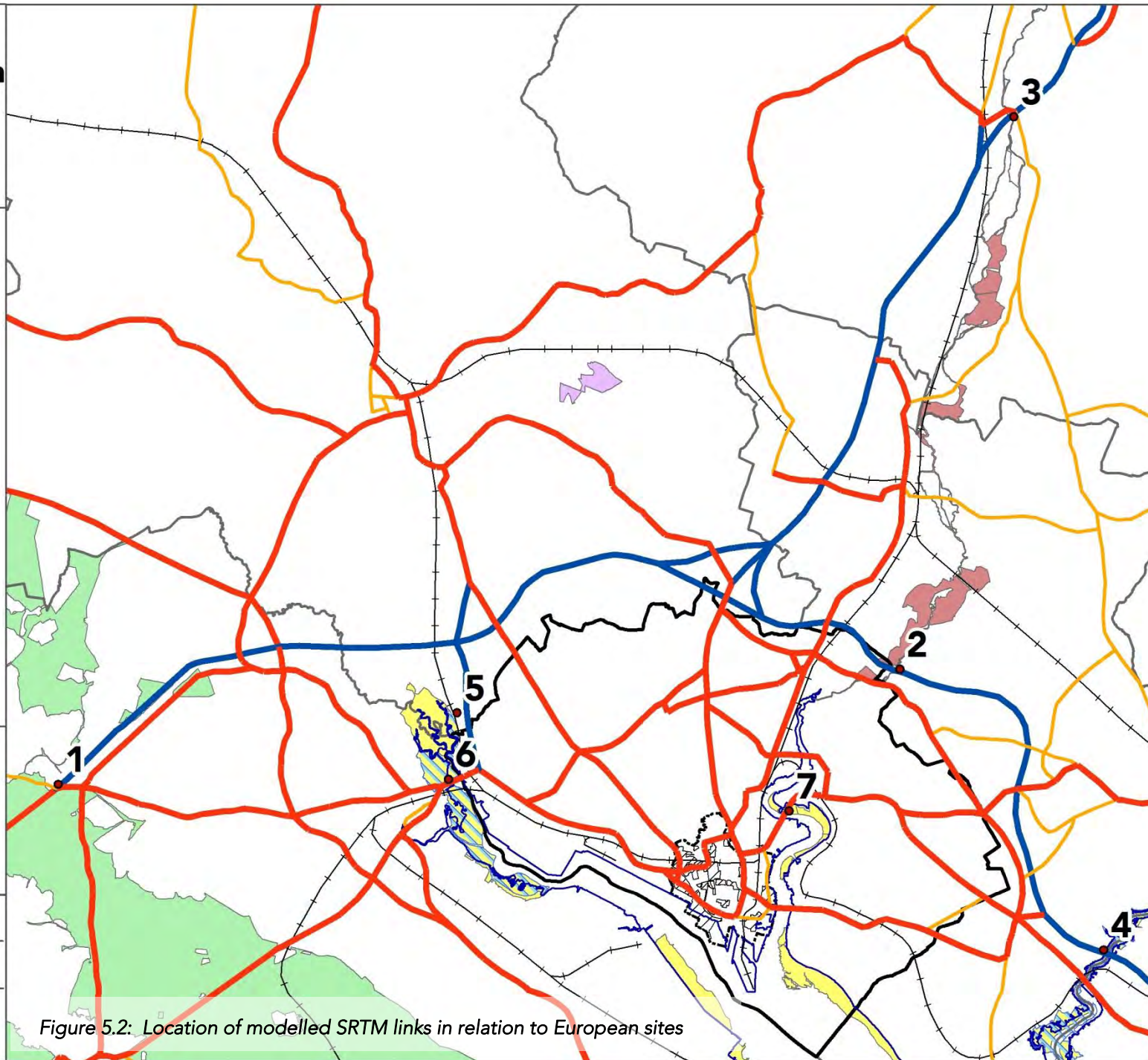


Figure 5.2: Location of modelled SRTM links in relation to European sites

5.4 Comparison of Data from SRTM and Local Planning Evidence

5.4.1 The Sub-Regional Transport Model (SRTM) was developed for the Solent area. It was used to examine the predicted changes to traffic flow of development in Southampton over the period to 2026, from a 2010 base year. A spreadsheet model was historically developed to provide transport evidence for the Southampton Core Strategy. This has recently been updated to provide evidence for the CCAP. The following sections consider the difference in outputs from these two models, in terms of predicted transport impact.

Differences between SRTM and Spreadsheet Model

5.4.2 The differences between the SRTM and Spreadsheet Model need to be borne in mind when comparing data. Some key differences to note are explained in Table 5.3:

Table 5.3: Comparison of SRTM and Spreadsheet Model

Variable	SRTM	Spreadsheet Model	Notes
Modelled period	Covers whole day, with ability to extract specific time of day data.	Primarily AM peak only. PM peak model was historically, but has not currently been updated.	Peak produced
New city centre development	Considers all proposed development, including residential, retail and offices.	Only considers retail and offices.	AM peak inbound flows should be consistent as residential would generate very few trips. More potential inconsistency with AM peak outbound trips, as spreadsheet model would not include out-commuting trips from city centre residential redevelopment.
Base Year	2010	2012	There has been some additional development over the 2010 to 2012 period, which means the base years are not entirely comparable. However, 12 hour count data indicates no noticeable change in traffic flow between 2010 and 2012, demonstrating that this development has not had an impact.
Interventions	Includes all committed interventions including ongoing LSTF Behavioural Change Programme	No specific interventions assumed in data presented in Table 2.	Modal split changes between 2012 and 2026 in Spreadsheet Model are due to relative increases in population in locations more accessible by alternative modes to the car to the city centre.

Comparison of AM Peak Data

5.4.3 The following table illustrates the predicted changes in traffic flow over the period to 2026, due to development in Southampton city centre, at the critical locations identified during the HRA. The AM peak is the key period that can be used to make a comparison between the data in the SRTM and the Spreadsheet Model.

Table 5.4: Comparison of AM peak data

Location	SRTM – Full demand (pcu)	SRTM - Soton demand (pcu)	Spreadsheet model – Soton Demand (pcu)
M27 (J1-J2) – Outbound	536	28	8
M27 (J1-J2) – Inbound	778	42	20
M3 (J10-J11) – Outbound	612	134	7
M3 (J10-J11) – Inbound	644	92	42
M27 (J8-J9) – Outbound	839	51	28
M27 (J8-J9) – Inbound	1031	64	174
M271 (Redbridge – J1) – Outbound	136	6	20
M271 (Redbridge – J1) – Inbound	547	228	155
Redbridge Causeway – Outbound	392	139	32
Redbridge Causeway – Inbound	208	42	-21
OUTBOUND TOTAL	2515	358	95
INBOUND TOTAL	3207	468	370
OVERALL TOTAL	5722	826	465

5.4.4 Looking initially at the **Inbound** data, the overall figures for Southampton demand between the SRTM and the spreadsheet model are not significantly different, with the spreadsheet model predicting flow increases around 80% of the level predicted by the SRTM. Much of this can be explained, by the different base years, with the SRTM assuming higher levels of development over the 2010 to 2026 period, compared to the 2012 to 2026 period used in the Spreadsheet Model. However, as is shown below, city centre development implemented between 2010 and 2012 does not appear to have had a significant impact on overall traffic levels.

5.4.5 Looking at individual links for inbound flows, some key points to note are:

- ▶ The Spreadsheet Model predicts a much higher flow from the east via the M27 J8-J9. This reflects the larger predicted population increases to the east of the city. The SRTM will be more sophisticated at looking at this issue and will also take account of the capacity of the M27 itself to accommodate such increases, which would be difficult in the AM peak. The Spreadsheet Model does not take account of network constraints; and
- ▶ The Spreadsheet Model is predicting a small reduction in the flow on Redbridge Causeway due to new development. This reflects the relative reduction in population west of Southampton, particularly in comparison with the east. Whether this relative change in origin point changes as quickly as relative population remains to be seen. The SRTM is not predicting a significant increase in the inbound flow on Redbridge Causeway.

5.4.6 Turning to the **Outbound** data, there is a much greater discrepancy between the SRTM and Spreadsheet Model data. This is primarily because the Spreadsheet Model does not include outbound trips generated by residential development, which are significant during the AM peak. The section below includes consideration of such trips over the 2006 to 2012 period.

Examination of Travel Trends 2006 to 2012

5.4.7 This section examines actual trends in travel over the first period covered by the CCAP from 2006 to 2012 to assess the impact of city centre development over this period. This includes an examination of both modal split and 12 hour count data, which is collected on an annual basis.

Changes in Development

5.4.8 The following city centre development was implemented over the 2006 to 2012 period:

- ▶ 1,606 residential units, which has increased the city centre population in Bargate Ward by 20%
- ▶ 46,506 sqm net increase in B1 office floorspace
- ▶ 34,320 sqm of new retail, including a new IKEA store

Modal Split Data

5.4.9 Modal split data is collected annually for people arriving and departing from the city centre. This data is an essential component of the Spreadsheet Model and is presented in Table 5.5 in the same way it used in the model. This uses a combination of Inner and Outer Cordon data and uses three year averages to minimise year on year fluctuations in the data.

12hr Count Data

5.4.10 Twelve hour counts are undertaken annually on major roads in Southampton. The routes selected in Table 5.6 below cover the key radial routes to and from the city centre, to identify trends in vehicle movements on routes serving the city centre. Total vehicles are all motor vehicles, including HGVs.

Table 5.5: Modal split data (People)

AM Peak (Inbound)	Cars	People by car	Bus	Motor cycles	Cycles	Ferries	Rail	Pedestrians	TOTAL PEOPLE
2004-06 average	10263	12706	3409	216	401	449	948	2080	20210
		62.9%	16.9%	1.1%	2.0%	2.2%	4.7%	10.3%	
2010-12 average	8908	10780	2757	147	462	334	1142	2399	18060
		59.8%	15.3%	0.8%	2.6%	1.9%	6.3%	13.3%	

Off Peak (Outbound)	Cars	People by car	Buses	Motor cycles	Cycles	Ferries	Rail	Pedestrians	TOTAL PEOPLE
2004-06 average	5326	7271	1607	80	118	101	867	1577	11620
		62.6%	13.8%	0.7%	1.0%	0.9%	7.5%	13.6%	
2010-12 average	4412	5814	1568	51	109	103	1044	1575	10263
		58.0%	14.7%	0.5%	1.2%	1.0%	9.8%	14.8%	

PM Peak (Outbound)	Cars	People by car	Buses	Motor cycles	Cycles	Ferries	Rail	Pedestrians	TOTAL PEOPLE
2004-06 average	10005	13268	3210	260	341	380	900	2741	21099
		62.9%	15.2%	1.2%	1.6%	1.8%	4.3%	13.0%	
2010-12 average	8988	11616	2883	208	351	350	1100	3210	18935
		58.8%	14.6%	1.1%	2.0%	1.8%	5.6%	16.2%	

Table 5.6: 12hr count data (motor vehicles)

AM Peak Inbound *	Millbrook Rd	Shirley Rd	Hill Lane	The Ave	Lodge Rd	Bevois Val Rd	Northam Bridge	Itchen Bridge	TOTAL VEHS
2004-06 average	2891	674	535	1474	662	811	2137	1556	10740
2010-12 average	3129	594	505	1224	665	684	2009	1265	10076
Change	+238	-80	-30	-250	+3	-127	-128	-291	-665
	+8.2%	-11.9%	-5.6%	-17.0%	+0.4%	-15.6%	-6.0%	-18.7%	-7.0%

* AM Peak = 08.00-09.00

AM Peak Outbound*	Millbrook Rd	Shirley Rd	Hill Lane	The Ave	Lodge Rd	Bevois Val Rd	Northam Bridge	Itchen Bridge	TOTAL VEHS
2004-06 average	1646	625	566	634	442	448	773	440	5573
2010-12 average	1664	536	509	725	457	430	853	457	5631
Change	+18	-89	-57	+91	+15	-17	+80	+17	+58
	+1.1%	-14.2%	-10.1%	+14.4%	+3.4%	-3.9%	+10.3%	+3.8%	+1.0%

* AM Peak = 08.00-09.00

12 hour 2-way *	Millbrook Rd	Shirley Rd	Hill Lane	The Ave	Lodge Rd	Bevois Val Rd	Northam Bridge	Itchen Brdg	TOTAL PEOPLE
2004-06 average	46731	14158	1102 8	2022 6	12443	15811	29707	1697 1	167074
2010-12 average	43248	13152	9791	1999 9	11668	14462	27118	1593 3	155371
Change	-3483	-1006	- 1237	-226 11.2 %	-775	-1349	-2589	- 1039 6.1%	-11703
	-7.5%	-7.1%	- 11.2 %	- 1.1%	-6.2%	-8.5%	-8.7%	- 6.1%	-7.0%

* 12hr = 07.00-19.00

Analysis of Travel Trends

5.4.11 There is clearly a significant amount of data to digest from both the Modal Split and 12 Hour Count data, but some relevant factors are as follows:

- ▶ Despite significant levels of development in the city centre over the 2006 to 2012 period, overall travel demand to and from the city centre has generally decreased and the proportion of journeys made by car has also decreased. This is consistent with national observations on urban roads, as illustrated in Figure 5.3;
- ▶ The proportion of people walking, cycling and using rail has increased over the period, although bus usage has decreased. (Note that the increase in walking and cycling will be higher in practice, as the modal split surveys do not pick up trips wholly within the city centre, which has seen increased population levels over the 2006 to 2012 period); and
- ▶ There has been a small overall increase in outbound trips during the AM peak, which can probably be explained through increasing number of people out-commuting from the city centre, due to its increased population.

5.4.12 Therefore, despite increases in city centre development, this has not, in practice, generally resulted in a commensurate traffic impact on roads serving the city centre. It is not entirely clear why this is the case, but some likely factors are:

- ▶ Recent more challenging economic conditions; and
- ▶ Although there has been a net increase in the amount of city centre B1 office floorspace, a number of older buildings are no longer occupied, with companies migrating to newer facilities.

5.4.13 However, despite this, the increases in city centre population and retail floorspace are real and have not had a significant impact on traffic levels.

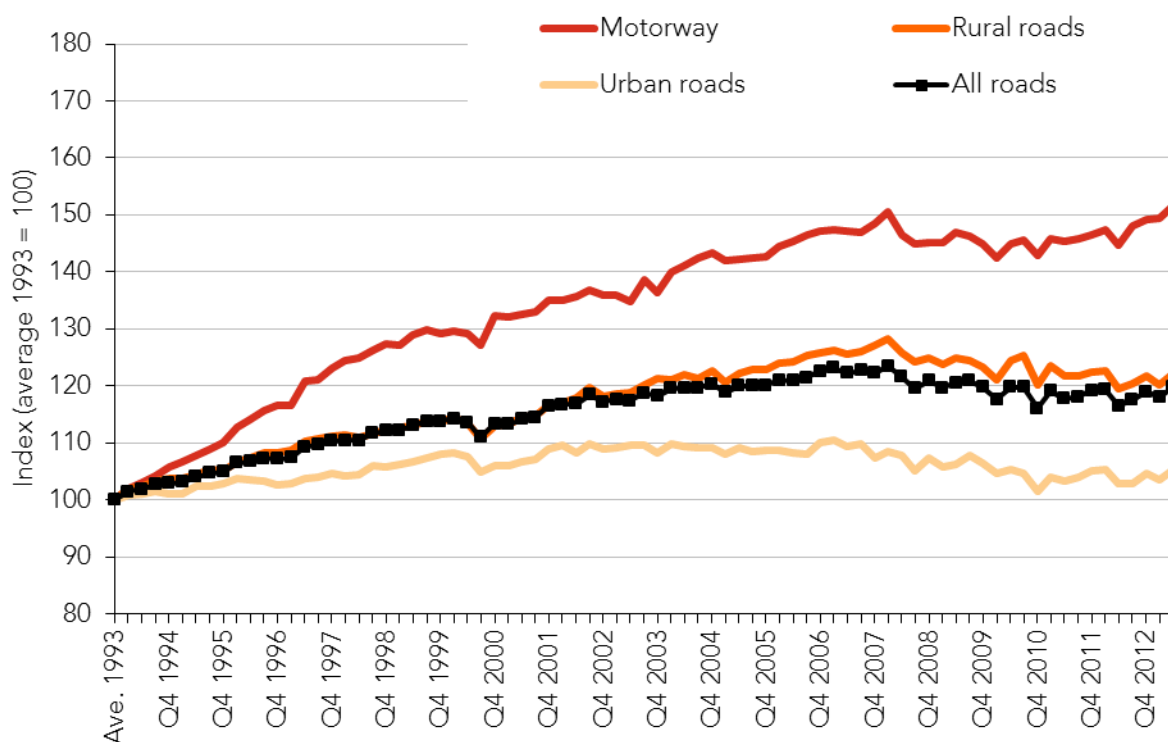


Figure 5.3: Road traffic by road class: Great Britain, quarterly from 1993 (Source: DfT)

Looking Forward

- 5.4.14 Given what has been observed over the 2006 to 2012 period, what are the implications of this for the traffic impact of future development over the period to 2026? In relation to **offices**, it is unlikely that the currently unoccupied poorer quality stock will be reused without significant upgrade. In addition, some of this is now being converted to residential uses, with a current emphasis on student accommodation. This latter use has very little traffic impact, but does count towards the overall city centre **housing** targets.
- 5.4.15 Turning to **retail**, there will be ongoing expansion, but evidence from Ikea in particular (which has a wide catchment area) is that locating more retail in city centres does not have a significant additional traffic impact. This is because:
- ▶ Many trips are linked with other journey purposes and many of these trips were already visiting the city centre. Duration of stay may increase, but this does not have a significant traffic impact; and
 - ▶ People have a range of travel choices and evidence shows modal shift away from the car for journeys to and from the city centre.
- 5.4.16 So far as travel trends are concerned, the population increases will largely be focussed in locations where people have good access to and from the city centre, not least in and around the city centre itself, leading to further increases in the proportion of journeys made by alternative modes to the private car. In addition, an increasing number of office based

employees also have direct access to a range of retail and leisure opportunities, within a short walking distance. This further minimises the need to travel.

Conclusions on Local Planning Evidence

- 5.4.17 The SRTM and Spreadsheet Models predict different levels of traffic impact from development in Southampton city centre over the period to 2026, with the latter predicting less impact overall, although not on each specific corridor. However, it is also important to note that the Spreadsheet Model does not include any future interventions and is therefore underestimating modal shift, which is being promoted through the Local Sustainable Transport Fund (LSTF) programme.
- 5.4.18 Other data from the 2006 to 2012 period indicates that the actual traffic impact of development is less than predicted, primarily due to the unique characteristics of city centres. This emphasises that city centres are the most sustainable locations for development and minimise traffic impact. Looking ahead to 2026, population and other trends will further reinforce this. Taking into account actual trends since 2006, it reasonable to conclude that the traffic impacts identified in both the SRTM and Spreadsheet Model are likely to be less in practice.

5.5 Offsetting Measures Provided within the Plan

- 5.5.1 Despite the level of background air pollution and predictions of traffic growth from development in Southampton referred to above, the City Centre remains a relatively sustainable location in which to focus major development. It is served well by public transport, has a Local Transport Plan that promotes walking, cycling and public transport, and a mix of current and planned land uses that will help to reduce the need to travel.
- 5.5.2 Specific policy proposals in the CCAP which may help to improve overall air quality include policies 14 (renewable or low carbon energy), 12 (green infrastructure and open space), 13 (open space in new developments), 18 (transport) and 19 (strategic links). Policies 18 and 19 are particularly relevant and focus of the following themes:
- ▶ Improvements to walking / cycling – the City Streets Programme prioritises improvements to pedestrian routes out of the station, around the Civic Centre and main shopping area, as well as other key routes around the city centre;
 - ▶ Cycle - new and enhanced existing cycle routes into the city will be created with improved surfaces, signage, crossings, and storage facilities;
 - ▶ Bus Strategy – the aim is to deliver improved facilities and convenient services which penetrate to the edge of the pedestrian shopping area and which link to other destinations throughout the city centre. Improvements will incorporate a network of Super-Stops - key interchange points on the city centre bus network, with an enhanced range of facilities for passengers;
 - ▶ Rail – there remains flexibility and capacity on passenger services to meet increased demand from future city growth despite expected increases in rail freight traffic. The main focus for the CCAP is on improving the facilities at Central Station, including a transport interchange, and upgrading pedestrian links from the station to the rest of the

city centre, to facilitate extra passenger numbers and make rail use and connections more attractive;

- ▶ Car – the aim is to encourage the relocation of commuter and visitor car parks from the core, to multi storey formats on the edge of the city centre. Car parks will be linked to the rest of the city centre via attractive and convenient pedestrian routes, while adjustments will be made to the road network to promote alternative modes; and
- ▶ Green travel plans – major developments will be required to prepare a Transport Assessment and Travel Plan to promote travel by sustainable modes and encourage car sharing.

5.5.3 Additionally, it is possible that trends in emissions per vehicle will fall in future as the effects of technological advance and tighter regulation under the new Euro 6 standards begin to take hold.

5.6 Impact Assessment

5.6.1 This section considers the available data in relation to the conservation objectives of the New Forest SAC/Ramsar, River Itchen SAC and Solent Maritime SAC.

Objective 4: The geographical distribution of the habitats and their overall area within the sites should be maintained or increased

5.6.2 In the context of elevated background atmospheric pollution and deposition, future increases in traffic growth may result in changes in the distribution and condition of qualifying habitats, especially where they occur within 200m of strategic road corridors. The available data shows that traffic growth is expected in the future, but that this will be accompanied by continued decreases in city centre travel demand and modal share of car transport.

Objective 5: The mix of species (their species structure) and the ecological inter-relationships between these and other environmental and management factors (ecological function) which are needed for the long-term maintenance of the habitats should be likely to continue to exist

5.6.3 In locations close to the road network, if pollution levels/loads increase then species richness may decline due to eutrophication and increasing acidity. The ecological function of qualifying habitats, and the interactions of typical species, may be degraded.

Objective 6: The conservation status of the habitats' typical species are maintained in terms of their population size, range and habitat extent

5.6.4 The range, population size and extent of habitats and their typical species may deteriorate due to elevated inputs of atmospheric pollutants, if this was to occur.

5.7 Conclusions and Recommendations

5.7.1 The CCAP acknowledges the potential for development to lead to increased traffic flows and emissions and sets out a range of practical measures to help prevent this and, while the quantum of development proposed has decreased, increases in background traffic flow can be expected whether or not city centre development continues. The primary aim of the CCAP with regard to transport is to reduce the need to travel, encourage modal shift and reduce traffic congestion. However, further measures are recommended to ensure that monitoring of traffic growth, and its implications for pollution emissions and ecological change, is carried out and appropriate mitigation measures are deployed if necessary. These are described in **Table 5.7**. Once the recommendations are incorporated within or referred to by the CCAP, it can be concluded that the plan is Habitats Regulations compliant.

Table 5.7: Recommendations for avoiding the CCAP's atmospheric pollution effects

Additional avoidance measures recommended for the CCAP

The City Council should undertake a staged programme of monitoring as follows:

1. Monitoring of traffic flows on key radial routes to/from the City Centre such as the points depicted on Figure 5.2.
2. If the results of 1 show increases in traffic flow which exceed those predicted to occur once reasonable modal shift predictions are taken into account, then further monitoring of pollution emissions changes should be carried out at the same locations.
3. If the results of 2 show that overall emissions are also increasing, then additional monitoring of ecological changes to internationally important habitats within 200m of these locations should be undertaken.

All three phases of monitoring should be preceded by an initial study to establish the baseline from which to monitor change.

If monitoring shows that additional mitigation is required to prevent long-term changes in species composition within European sites, the following measures should be considered:

- Additional transport measures to ensure the necessary modal shift away from car use is achieved - promoting non car modes, travel plans, reduced car parking, etc;
- Traffic management - speed/flow management, low emission zones, an ECO stars fleet recognition scheme⁵, etc;
- Emission reduction at source - promotion of electric vehicles, use of ultra-efficient fuels, emissions testing, etc; and
- Roadside barriers – use of barriers, tree planting and absorptive materials to prevent pollutants from reaching protected habitats.

⁵ See for example the scheme run by Gedling Borough Council:

<http://www.gedling.gov.uk/wasterecyclingenvironment/environmentalhealth/ecostars/>

6 Disturbance

6.1 Baseline Conditions

- 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 strategic residential development targets across South Hampshire, 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 at coastal and inland areas, and 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. 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).
- 6.1.3 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). The New Forest SPA will therefore be experiencing different challenges as a result of recreational pressure than Solent and Southampton Water SPA/Ramsar, and those further afield at Portsmouth, Langstone and Chichester Harbours.
- 6.1.4 At the New Forest, it is the ground and near-ground nesting birds that are particular receptors of negative effects, such as Dartford warbler, nightjar and woodlark. 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 (eg, close to access points and car parks) delayed the start of their breeding by up to six weeks, preventing multiple broods and so reducing annual productivity. Most of this disturbance was found to come from dog-walkers as a result of dogs being encouraged to run through the vegetation after sticks.

- 6.1.5 At the coastal areas, it can be helpful to divide impacts into the effects of disturbance on overwintering birds, or on breeding birds (Stillman *et al*, 2009). Impacts to wintering birds are thought to be centred on interruption to foraging, and less so roosting, and 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 (avoiding disturbance) (Stillman *et al*, 2009). During the breeding season, impacts on shorebirds are akin to those on ground-nesting inland birds, in that predation of eggs, as well as trampling and increased thermal stress, when birds flush the nest in response to a disturbance event has a negative impact on breeding success (Stillman *et al*, 2009).

6.2 Impact Source

- 6.2.1 The screening exercise revealed that, through their residential development elements, proposed policies 9, 23, 24, 25, 26, 27, 28, 29, 31, 32, 33, 34, 35, 36 and 37 were likely to lead to population growth and increasing recreation pressure.

6.3 Impact Pathway

- 6.3.1 Two studies have examined the sources and mechanisms of these impacts: Sharp *et al* (2008) analysed patterns of visiting activity at the New Forest, while the Solent Disturbance and Mitigation Project is an ongoing study aiming to model the impacts of development and visitor pressure along the Solent coastline.

New Forest

- 6.3.2 Analysis of changing patterns of visitor behaviour in the New Forest informs this section (Sharp *et al*, 2008). 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. The report states that the estimated number of current annual visits to the New Forest (over 13 million per year) is predicted to increase by 1.05 million visits annually by 2026 based on sub-regional development objectives at the time the work was carried out.
- 6.3.3 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 6.1** which depicts the estimated population density within each distance band by 2026. New residential development promoted by the CCAP will therefore fall within the sphere of highest potential influence on the New Forest, albeit on the outer edge of that zone.
- 6.3.4 The Southampton Core Strategy recognises the likely recreational pressure associated with additional growth in the City (16,300 new dwellings in total), and Policy CS22 Promoting Biodiversity and Protecting Habitats is a high level policy that seeks to address this. The policy provides for protection of designated local, national and international sites, together with other

measures to protect and enhance biodiversity, including promoting wildlife corridors and measures to ensure development protects and enhances features of biological interest. In relation to European sites, the supporting text states:

'The Council commits to working with partners in the sub region to develop and implement a strategic approach to protecting European Sites. This approach will consider a suite of mitigation measures, including adequate provision of alternative recreational space and support via developer contributions for access management measures within and around the European sites. Development proposals will be expected to contribute towards the conservation, enhancement and restoration of biodiversity as required by PPS9' (SCC 2010, p.74).

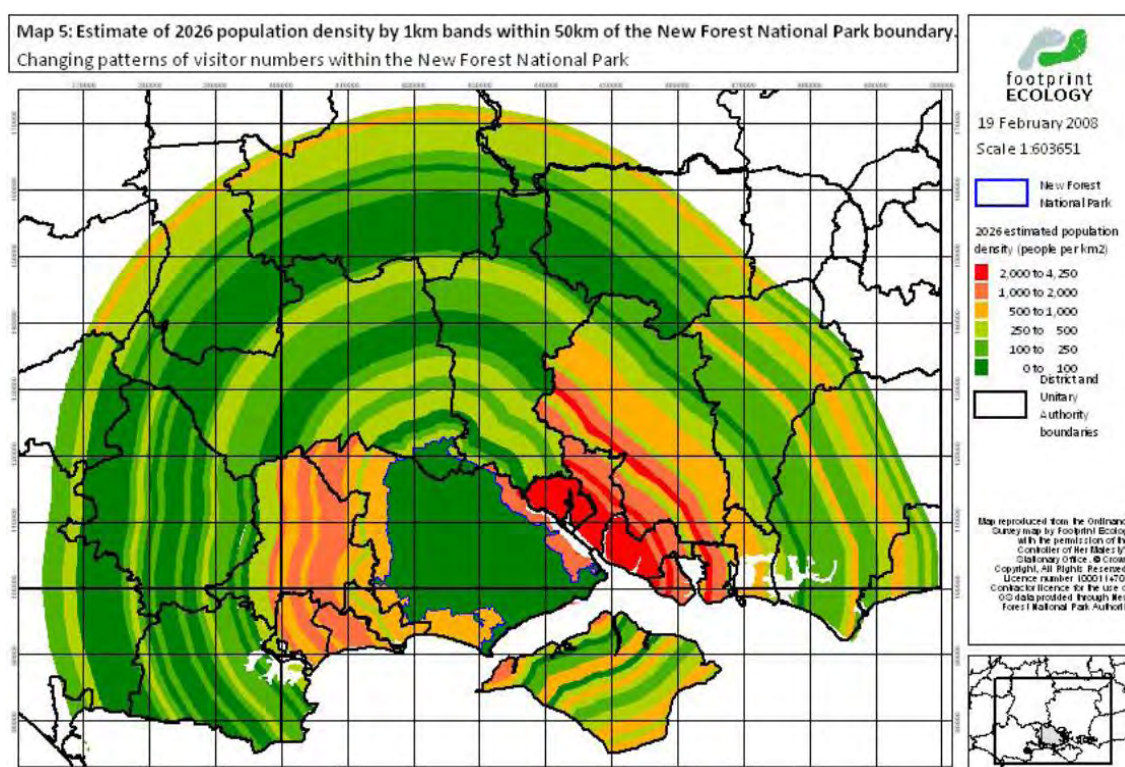


Figure 6.1: Estimate of 2026 population density in areas surrounding the New Forest (Source, Sharp et al, 2008)

- 6.3.5 Policy CS21 Protecting and Enhancing Open Space sets out the Council's commitment to retain, enhance and supplement the City's existing multi-functional open spaces, and refers to the Council's joint-working with the landowner and Test Valley Borough Council to develop a new forest park at Lords Wood on the northern city boundary in order to relieve pressure on the New Forest. The Inspector endorsed the proposal in his report on the Core Strategy following Examination in Public. This is intended to provide residents with a nearby Suitable Alternative Natural Greenspace (SANG), to absorb additional recreational pressure resulting from residential development in the City, including the City Centre. Test Valley Borough Council published a feasibility study for the project in March 2011, and plans are currently progressing to implement the proposal over the plan period for the borough. Within Southampton City Centre it will be equally important to promote the use of existing and nearby alternatives to the

New Forest, such as the central parks and the City's Common. Policies within the CCAP seek to enhance the accessibility and quality of these sites (e.g policies 12, 13, 18 and 19).

- 6.3.6 Despite these city centre initiatives and the planned provision of alternative sites such as Lords Wood, a residual number of visits to the New Forest are always likely to remain because of the very high quality experience it offers and difficulty in recreating this elsewhere. Furthermore Sharp *et al* (2008) demonstrate that it is not just Southampton and Test Valley developments that will lead to impacts at the New Forest, and it is probable that a strategic approach to managing access will be required. The National Park's *Recreation Management Strategy* (2010) seeks to reconcile visitor activity with nature conservation within the Forest and manage recreational access accordingly.
- 6.3.7 It explores a range of recreation management tools, including: a survey and research programme to inform future decisions; provision of new areas of green infrastructure; selective locations for enhanced visitor facilities; and limitations on car parking provision. The *Recreation Management Strategy* also underwent HRA which concluded that, given the overall purpose of the strategy is to manage recreation and visitor pressures to avoid impacts on the European nature conservation interest, the document would not lead to adverse effects. Together, delivering SANGs and the *Recreation Management Strategy* constitute a series of projects to which development outside of the New Forest can contribute financially, providing a mechanism for ensuring the impacts of residential development can be mitigated

Coastal areas

- 6.3.8 The Solent disturbance and mitigation project was initiated in response to concerns over the impact of disturbance on coastal birds and their habitats. All three phases are now complete, and some of the key findings from the project are presented in this section. The focus of the project is on the likely effect of increased visitor pressure and recreational use arising from planned strategic development in the Solent area, in relation to disturbance impacts on overwintering birds within the SPAs and Ramsars.
- 6.3.9 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. An estimated 1.44 million people live within a ten minute drive of a car park at the Solent coast (Stillman *et al*, 2009). Tourists make up a significant proportion of visitors at some sites, although sites vary in their attractiveness to tourists, suitability for particular kinds of access, and accessibility to the local population.
- 6.3.10 To the east of Southampton Water there are much higher densities of housing and at many sites local people are likely to account for a higher proportion of visitors. Sites such as Hayling Island have holiday accommodation and attract staying tourists. Future development is likely to result in a large increase in the residential population, particularly in the vicinity of Southampton, Portsmouth and Fareham. But monitoring of recreational access had been limited prior to 2009, making it difficult to determine how patterns of access have changed over time and how they may change in the future. As the document states, '*in order to determine how new housing might change visitor levels in the future it will be necessary to separate local visitors from tourists, categorise visitors according to the activities undertaken at sites and take*

into account the variation between sites in terms of attractiveness and suitability for different activities' (Stillman et al, 2009, p36).

Early results from visitor surveys and bird observations

- 6.3.11 Phase 2 of the project ran from 2009 to 2012, and gathered data on bird numbers (including at two sites near Southampton City Centre; site 18 Eling and 24 Weston Shore) and their responses to various forms of recreational disturbance, while visitor surveys established visiting patterns at specific sites (including at the same two sites near Southampton). Household surveys explored which locations are most popular and why. Phase 2 culminated in a modelling exercise to predict the disturbance response effects on birds at hotspots of recreational visiting activity. Phase 3 combines the findings of earlier phases in order to determine how development planning can influence these responses, and explore ways in which impacts might be mitigated.
- 6.3.12 Local data from phase 2 reports provide some contextual information. The visitor surveys at Eling and Weston Shore (Fearnley et al, 2010) found that the majority of people visited the sites to go for a walk or walk the dog, and that the average distance people travelled in order to do this were 1km and 1.7km respectively. It should be noted, however, that Eling is approximately 4.4km from the nearest extent of the City Centre boundary, and Weston Shore is approximately 1.9km away. For both locations, there are significant geographical barriers to travel from the City Centre, Southampton Water for Eling and the River Itchen for Weston Shore, although closer sections of protected intertidal can be found at, and north and south of, Chessel Bay. Indeed, the report shows that none of the 20 survey locations recorded any visitors from within Southampton City Centre.
- 6.3.13 The phase 2 bird disturbance fieldwork (Liley et al, 2011) indicates that birds utilising areas around Eling and Weston Shore appear to be relatively well habituated to human activity. At Eling, of the 137 observations recorded, 80% were categorised as birds exhibiting 'no response'; 20% resulted in a change of behaviour. At Weston Shore, of 212 observations 83% led to 'no response' and 17% resulted in a change of behaviour (there was also 1 observation that was uncategorised). The results across all categories of bird response for the two sites are summarised in Table 6.1.

Table 6.1: Number of observations (events within 200m of birds at each site) and the responses, by site (Source: Liley et al, 2010)

Site	Response of birds							% Disturbed
	Total observations	No response	Uncategorised	Alert	Short walk/swim	Short flight	Major flight	
Eling	137	110	-	14	6	1	6	20
Weston Shore	212	177	1	8	10	2	14	17

- 6.3.14 Inter-species variation in the response rate to disturbance events, as illustrated in Figure 6.2. Generally speaking, the most popular types of recreational activity (dog walking (with dog on-

lead), walking, cycling and jogging) showed very high levels of ‘no response’ in birds. It is the less frequent and more unusual activities such as rowing a boat, horse riding, surfing and kite playing which generated a greater degree of response. This is illustrated in Figure 6.3. Solent-wide, while dog walkers with dogs off the lead account for only 2% of the total number of observations, this led to 27% of the occurrences of a ‘major’ response (birds taking flight and flying for 50m or more). If dogs on the foreshore are also included then a total of 47% of major flights are caused by dogs off their leads.

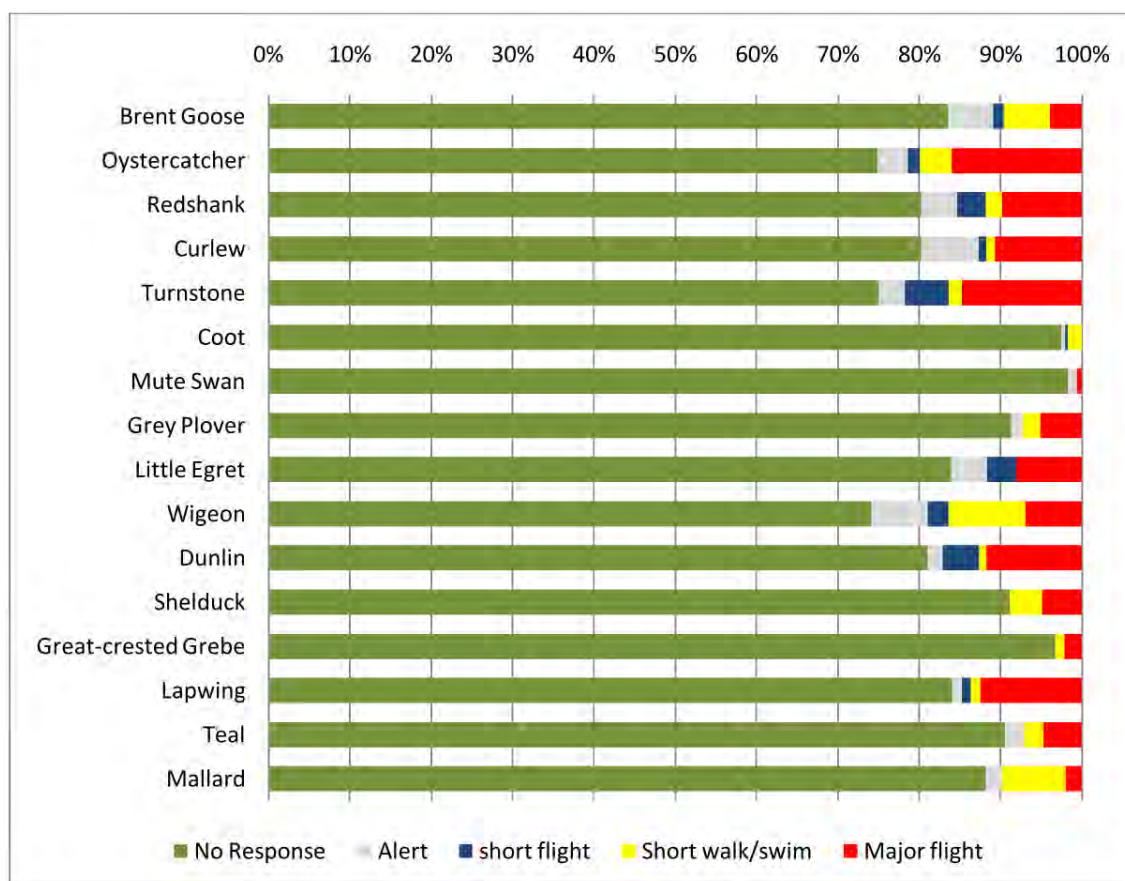


Figure 6.2: Response to disturbance events by species. All species for which there were data from at least 50 events are included (Source: Liley et al, 2010)

6.3.15 The household survey (Fearnley et al, draft 2010) includes estimates of visitor numbers and modes of transport to sections of Solent coastline most relevant to the CCAP. These include section 19 (Freemantle to Ocean Village, including the (inaccessible) Port), and section 20 (Ocean Village Marina to Itchen Bridge). Section 19 is thought to be receiving around 2.2 million visits annually, of which just over 1 million visit on foot (from within 10km) and just under 1 million arrive by car (from within 30km). The remaining 188,604 travel by other modes e.g. public transport. Section 20 is estimated to receive 763,172 visitors annually, 423,964 by foot and 274,272 by car. Section 19 is not adjacent to areas designated as SPA.

6.3.16 The household survey concluded that an estimated 52 million visits are made to the Solent coastline each year by households living within a 30km radius of the coastline between Hurst Castle and Chichester Harbour, including the north shore of the Isle of Wight. By incorporating planning data from Local Authorities in the area, they go on to estimate that this number will

rise by 8 million visits annually to 60 million annual visits once all planned new residential development is occupied, an increase of 15%.

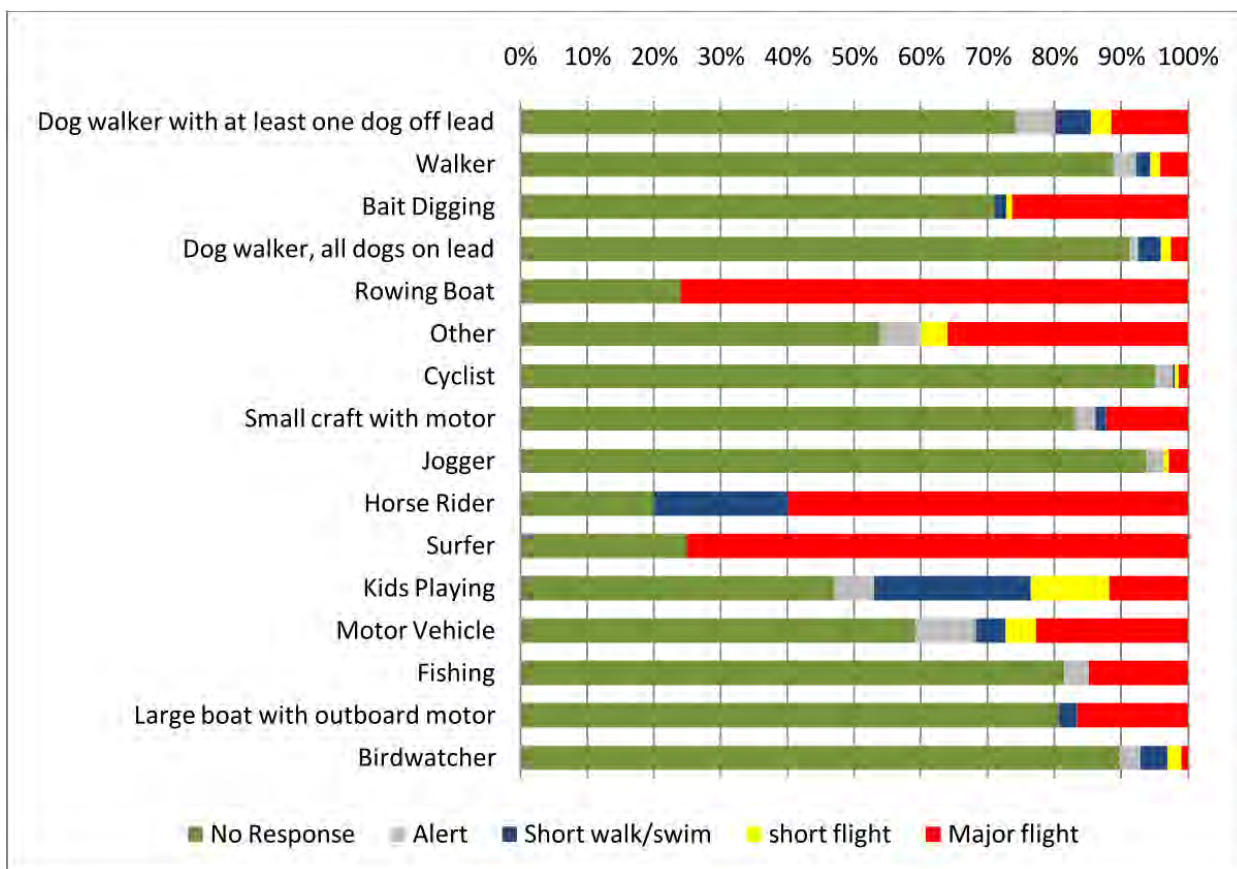


Figure 6.3: Responses of birds (grouped across all sites and all species) according to activity (Source: Liley et al, 2010)

Predicting the impact of human disturbance on overwintering birds

6.3.17 The final phase two report (Stillman et al, 2012) combines the data and modelling exercises from the earlier research activities to predict impacts on bird survival over the winter within different parts of the Solent. Bird survey fieldwork gave an indication of how birds respond to disturbance (e.g. taking flight, stopping feeding or avoiding disturbed areas) and the distance over which these responses were elicited from different types of human activity. 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.

6.3.18 The model incorporated the costs that birds incur when avoiding human activities (e.g. increased bird density in non-disturbed areas, reduced time for feeding and increased energy demands when flying way) as well as their abilities to compensate for these costs (e.g. by feeding for longer or avoiding more disturbed areas). The scope of the model included Dunlin, Ringed Plover, Redshank, Grey Plover, Black-tailed Godwit, Oystercatcher and Curlew, while a separate exercise addressed Dark-bellied Brent Goose; other overwintering species on the

SPA/Ramsar citations were not examined, including Teal, Pintail, Shoveler, Wigeon, Turnstone, Sanderling, Red-breasted Merganser and Shelduck.

- 6.3.19 As the report says, in the absence of disturbance all wader species modelled in the Southampton Water model were predicted to have 100% survival through the winter. Disturbance resulting from current levels of housing was predicted to reduce the survival of Dunlin, Ringer Plover, Oystercatcher and Curlew to approximately 88%, 89%, 95% and 94% respectively. Anticipated future levels of housing were predicted to further reduce survival rates in Dunlin and Ringed Plover to 85% and 84% respectively. These results are explained as follows:

“Dunlin, Ringed Plover, Oystercatcher and Curlew 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. Redshank, Grey Plover and Black-tailed Godwit typically had the shortest disturbance distances and were able to feeding relatively efficiently at night. This meant that they were less affected by visitors than species with longer disturbance distances, and were better able to compensate at night for lost feeding time and increased energy expenditure during the day. In addition, Black-tailed Godwit were able to feed terrestrially to supplement intertidal feeding.

“The remaining species had longer disturbance distances and so were more affected by disturbance from visitors. Ringed Plover had the lowest night-time efficiency and so was the species least able to compensate for disturbance by feeding at night. Although Oystercatcher and Curlew could feed terrestrially, these species had the longest disturbance distances. Furthermore, Oystercatcher consume larger prey items than the other wading bird species, which take longer to consume, which means there is more fighting over prey (interference competition) in this species than in others.” (Stillman et al, 2012, p.32)

- 6.3.20 Results from the Chichester Harbour model were inconclusive due to difficulties with the food availability data. Test runs of the model showed that a greater proportion of birds were predicted to die by the end of winter in an undisturbed scenario than is typically observed. Adjustments to parameters could not satisfactorily resolve the situation and further predictions were not made.
- 6.3.21 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.
- 6.3.22 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.

6.3.23 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 Swaything: 298.3 visits/day/ha; and
- ▶ 24 Weston to Netley: 63.9 visits/day/ha.

6.3.24 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 of Southampton City Centre 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. Additionally, there are significant geographical barriers to travelling from the City Centre to the more sensitive stretches of waterfront, including Southampton Water and the River Itchen.

Dark-bellied Brent Goose

6.3.25 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.

6.3.26 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).

Mitigating the impacts of strategically planned development

6.3.27 The Phase 3 report (Liley & Tyldesley, 2013) considers the available options for avoiding and mitigating impacts to the overwintering bird assemblage of the Solent European sites, in the context of current planning policy and regulation. It outlines a strategy of projects including 'quick wins' and longer term behavioural change initiatives for reducing the overall adverse effect such that planned new developments can be accommodated. It concludes that the strategy, once implemented, would be sufficient to address the impacts of a multitude of smaller scale residential proposals, but that larger scale schemes and those very close to the designated coast will still require individual project-level HRA and site-specific mitigation. The main aspects of the strategy include:

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

6.3.28 The site-specific projects which are discussed for coastal sections close to the City Centre are presented below, but the report points out that these should be informed by monitoring of the success of, and feedback from the initiatives above:

- ▶ 19 Freemantle to Ocean Village: Mayflower Park is targeted as a regeneration area to absorb visitors from nearby development. This could be used / promoted to deflect visitors from the SPA;
- ▶ 22 Northam Bridge to St. Denys: Increased wardening as the area is used for shell fishing;
- ▶ 23 St. Denys - Cobden Bridge to Swaything: Riverside back (a large car park which backs onto open space) could be enhanced as SANG and linked to the Itchen Navigation Project. Engagement with users (e.g. University rowing club) and wardening north of the river; and

- ▶ 24 Weston to Netley: Increased wardening along the whole section. An open area of grassland to the north could be linked up to provide circular walks and a route to Royal Victoria Country Park.

6.3.29 In its response to the Phase III report, Natural England discusses a three-stage approach to defining a full package of avoidance and mitigation measures for disturbance impacts, and concludes that funding contributions from new residential development proposals will be required from the outset while interim and long-term funding arrangements are being finalised. Assuming that is the case, it concludes that disturbance impacts on the Solent European sites' overwintering bird interest should not be a reason for refusing planning permission.

6.4 Offsetting Measures Provided within the Plan

6.4.1 Specific policy proposals in the CCAP which will help to reduce disturbance impacts include policies 12 (green infrastructure and open space) and 13 (open space in new developments).

6.4.2 Policy 10 has high potential to reduce disturbance as it seeks to reconfigure a major waterfront park at Mayflower Park. Together with the creation of new and enhancement of existing open spaces throughout the City Centre, Mayflower Park could draw in a significant number of coastal-bound visits generated by the development proposed in Southampton City Centre and its resulting increase in population. These measures are considered the most effective available to avoid the risk of increased disturbance at designated stretches of coastline as a consequence of the CCAP. Turning to the in combination effects of CCAP development and wider developments in south Hampshire, the Lords Wood forest park initiative (intended to draw in additional New Forest-bound visits) and implementation of the Solent Disturbance and Mitigation Project recommendations are considered to be sufficient to satisfactorily avoid and reduce the disturbance impacts of strategically planned development.

6.5 Impact Assessment

6.5.1 This section considers the available data in relation to the conservation objectives of Chichester and Langstone Harbours SPA/Ramsar, Portsmouth Harbour SPA/Ramsar, Solent and Southampton Water SPA/Ramsar and the New Forest SPA.

Objective 1: Maintain the population of each of the Annex 1 and migratory bird species as a viable component of their natural habitats on a long-term basis

6.5.2 It is concluded that the measures described in the SDMP Phase III report, development of the Lords Wood SANG, enhancements to City Centre greenspaces and implementation of the New Forest *Recreation Management Strategy*, are sufficient to prevent decreases in internationally important bird populations at European sites around Southampton as a result of disturbance.

Objective 2: Maintain the range (geographic extent) of the population of each of the Annex 1 and migratory bird species for the foreseeable future

6.5.3 It is concluded that the measures described are sufficient to prevent range contractions within internationally important bird populations around Southampton as a result of disturbance.

Objective 3: Maintain sufficient area of suitable habitat to maintain the populations of each of the Annex 1 and migratory bird species on a long term basis

6.5.4 It is concluded that the measures described are sufficient to prevent loss of the habitats used by internationally important bird populations around Southampton as a result of disturbance.

6.5.5 The CCAP is considered to be Habitats Regulations compliant with respect to disturbance impacts.

7 Water Demand

7.1 Background

- 7.1.1 Impacts through water demand and abstraction were initially screened-out of the Appropriate Assessment because of Southern Water's stated position in its Water Resource Management Plan (2009) that sufficient water is available to supply planned development at the strategic scale. If sufficient water was available for city-wide development objectives, then the CCAP as a subset of the city-wide development should not create additional problems. However, Natural England made the following comments on the HRA screening findings:

"With regard to the River Itchen SAC, we would wish to see the site screened in. This is because the Review of Consents on the river undertaken by the Environment Agency concluded a likely significant effect from abstraction. Whilst we accept that action is being taken to resolve the issue the licensed abstraction on the Itchen remains the same until such time as an alternative source of water can be found.

"Work is currently being undertaken to consider alternative sources for the public water supply and measures to maintain the required flow rate on the Itchen... It would appear that Southern Water is content that it has sufficient resources as it holds a licence on the Test and is not currently abstracting to its licence limit. However, having spoken to a water resource colleague at the Environment Agency the sustainability of the license limit is under review due to the SSSI designation of the River Test. As a result, until such time as the work is completed and the supply accepted as viable and without impact, the issue remains.

"Whilst we would hope that the issue will have been resolved prior to any major development of dwellings being undertaken in the city we should not lose sight of the issue whilst it remains, especially as I am advised that the alternative to the current options would be a de-salinisation plant, which may have its own issues."

Pers. comm. 2011a

7.2 Baseline Conditions

- 7.2.1 New homes require the development of new infrastructure, including the provision of fresh water supply. Water supply in Southampton is provided by Southern Water's Hampshire South Water Resource Zone (WRZ), which draws surface water from abstractions at Testwood on the River Test, Otterbourne on the Itchen, and groundwater from the Chalk aquifer at a ratio of approximately 60% surface water to 40% groundwater (Southern Water, 2009). However, abstractions from these systems alter the surface water regime, in turn impacting on important ecological receptors. There is a further freshwater requirement in maintaining ecological integrity of the intertidal zones of coastal sites.

- 7.2.2 The south east region has been declared an area of serious water stress, and the relevant Catchment Abstraction Management Strategy (CAMS) lists all surface water and groundwater management units as over-licensed, while some management units are over-abstracted (Southern Water, 2009). 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.
- 7.2.3 The Environment Agency's Review of Consents (RoC) under the Habitats Directive, completed in late 2007, has determined sustainable levels of water abstraction that can be met without adverse effects on the ecological integrity of European sites. The RoC process found that it was necessary to modify nine abstraction licenses, including the Otterbourne surface and groundwater licences, 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.
- 7.2.4 There are also theoretical pathways for abstractions on the River Test to impact on Solent and Southampton Water SPA / Ramsar and Solent Maritime SAC. However, the RoC for these sites did not result in the need for modification or revocation of any Southern Water abstraction licences. These sites are not therefore considered further for the purposes of considering the impacts of the CCAP.
- 7.2.5 As a result of the RoC findings, Southern Water has accepted changes to its abstraction licences (known as sustainability reductions) on the River Itchen, in order to maintain the integrity of the SAC. These are due to commence in 2015 and be introduced progressively over the following five years in accordance with a Memorandum of Understanding between the two water companies, the Environment Agency and the regulator, Ofwat.

7.3 Impact Source

- 7.3.1 Proposed policies 9, 23, 24, 25, 26, 27, 28, 29, 31, 32, 33, 34, 35, 36 and 37, through their residential development proposals, are likely to lead to population growth and increasing water demand.

7.4 Impact Pathway

- 7.4.1 Planning for the delivery of up to 5,450 new dwellings in the City Centre will require new water supplies to be developed, the impact of which is magnified when placed in the context of housing allocations across the South Hampshire sub-region. When combined with sustainability reductions to licensed abstraction limits to protect European sites' integrity, a combination of supply-side and demand-side measures will be required to address the resulting deficit. Demand management is primarily achieved through metering of supply and water efficiency measures, including leakage reduction, while new supplies can be developed by optimising abstraction and treatment infrastructure to make the most of available abstractions or constructing new storage reservoirs.
- 7.4.2 Southern Water's Water Resource Management Plan (WRMP) 2010 – 2035 (Southern Water, 2009) shows that the Hampshire South WRZ begins the planning period with a surplus of

3.76MI/d, rising to 18.82MI/d in 2014-15 for the peak deployable output condition (this increasing surplus is due to a steady reduction in demand driven by the introduction of household metering). However, the situation changes dramatically as a result of full sustainability reductions on the River Itchen by 2019-20; see **Figure 7.1**. The effect of the reductions leads to a supply/demand deficit of 52.26MI/d.

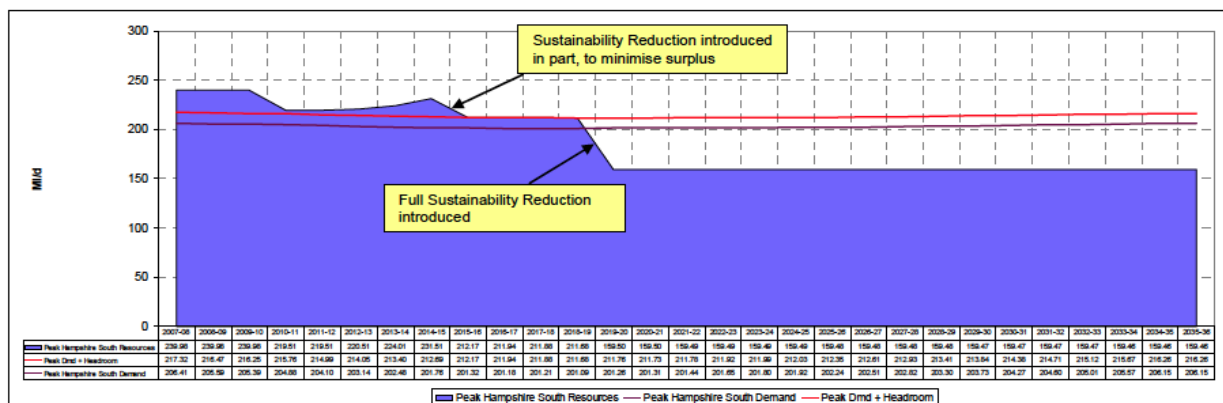


Figure 7.1: Hampshire South Peak Deployable Output Baseline Supply Demand Balance (Source: Southern Water, 2009)

7.4.3 The company’s agreed strategy to resolve this deficit embraces both demand management and resource development options, and can be summarised as follows:

During 2010 – 2015:

- ▶ A policy of universal metering throughout the area by 2015, which will give benefits in terms of demand savings and associated reductions in supply pipe leakage;
- ▶ The optimisation of inter-zonal transfers, from the Hampshire South WRZ to the Isle of Wight WRZ via the cross-Solent main;
- ▶ A series of groundwater source improvements, which could deliver over 9MI/d for the average condition;
- ▶ The development of Testwood water supply works up to the current licence limit; and
- ▶ The development of the enabling Testwood to Otterbourne transfer. (The Testwood schemes need to be implemented during 2010-15 so that implementation of the sustainability reductions on the River Itchen can begin from 2015.)

During 2015 – 2035:

- ▶ Transfer of the Candover/Alre river augmentation scheme to Southern Water from the Environment Agency, to enable the full yield benefits of the scheme to be realised, and satisfy any residual supply demand balance deficit arising from the sustainability reductions;
- ▶ The refurbishment of two small groundwater sources on the Isle of Wight;
- ▶ Refurbishment of three groundwater sources (eg, R167) in the Hampshire South WRZ;
- ▶ Water efficiency kits being issued on the Isle of Wight; and

- ▶ A total further reduction in leakage of 8.9Ml/d.

7.4.4 As a result of this strategy, the company states the following conclusions (see also **Figure 7.2**):

“The proposed Sustainability Reductions have a significant impact on the baseline supply demand balance, and therefore the Water Resources Strategy for the area. Following submission of the draft WRMP the company has met with Ofwat, EA, Natural England and Portsmouth Water to explore alternative options for allowing the Sustainability Reductions to be implemented without compromising security of supply. The company prepared a draft Memorandum of Understanding that set out the roles and responsibilities of each party and the schemes that would need to be implemented before the Lower Itchen abstraction licences would be voluntarily changed. Investigations would also need to be undertaken during AMP5 to confirm or otherwise the assumptions for the proposed operation of the Candover and Alre groundwater augmentation schemes which have been used for the supply demand balance of Hampshire South WRZ. The Memorandum of Understanding has been agreed and signed off by the relevant parties...”

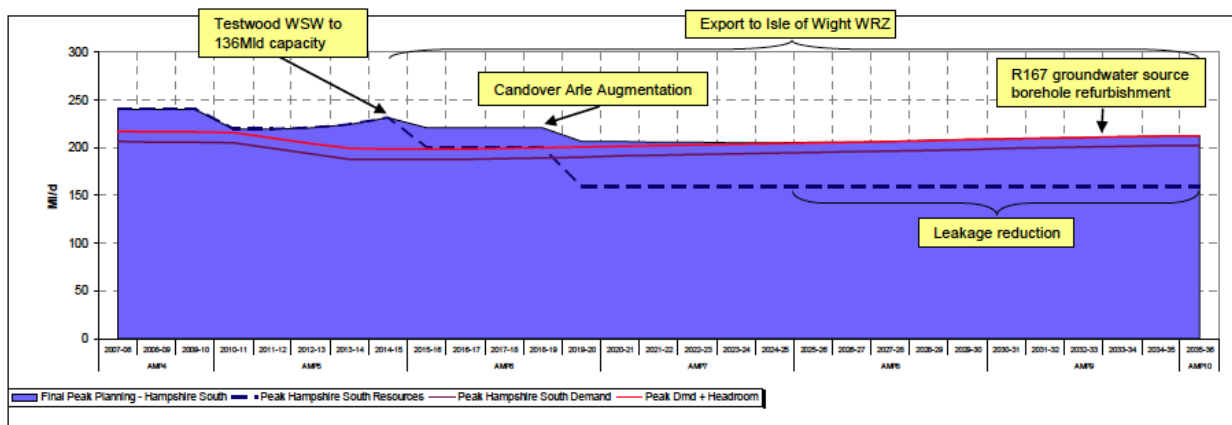


Figure 7.2: Hampshire South Peak Deployable Output Preferred Regional Strategy, assuming Sustainability Reductions, Supply Demand Balance (Source: Southern Water, 2009)

“The company would not be able to confirm its commitment to implementation of the full Sustainability Reductions at the end of AMP6 unless the following options are implemented in the Hampshire South and Isle of Wight WRZs, so that the security of supplies is maintained throughout the planning period:

- ◆ Universal metering;
- ◆ Leakage reduction;
- ◆ Asset improvement schemes for groundwater sources;
- ◆ Increase of Testwood WSW to licence limit;
- ◆ Development of the enabling Testwood to Otterbourne transfer and associated distribution infrastructure; and
- ◆ Optimisation of inter-zonal transfers (cross-Solent main).” (Southern Water, 2009, pp10-35)

7.4.5 Both the WRMP and Memorandum of Understanding therefore highlight Southern Water’s view that increasing the Testwood abstraction to the licensed limit plays a central role in its ability to maintain public drinking water supply and meet the sustainability reductions on the River Itchen. Given the uncertainty over the sustainability of the Testwood abstraction raised by Natural England, continuing adverse effects on the River Itchen SAC cannot be ruled out.

7.5 Offsetting Measures Provided within the Plan

7.5.1 The CCAP does not specifically promote demand management measures or water recycling to reduce water consumption. However, Core Strategy Policy CS20 Tackling and Adapting to Climate Change includes sustainability standards required for all new development (including that within the City Centre) and a section on conserving water resources; see **Box 3**.

Box 3: Core Strategy Policies which aim to conserve water resources

Extracts from CS20 Tackling and Adapting to Climate Change

Requirements for new development:

All residential development achieves at least the following level of the Code for Sustainable Homes:

All non-residential development with a floor space of over 500m² achieve at least the following BREEAM standards:

From 2010

Level 3

BREEAM ‘very good’

From 2012

Level 4

BREEAM ‘excellent’

From 2016

Level 6

BREEAM ‘excellent’

Improving Water Efficiency:

All development should maximise water efficiency through the installation of high performance internal fittings, as well as rainwater harvesting and greywater recycling systems where viable. These water efficiency measures must be integrated into the design of all development to a level that allows it to achieve at least the Code for Sustainable Homes / BREEAM standards or equivalent in accordance with the ‘Requirements for new development’ table above.

Extracts from Provision for Infrastructure

The key infrastructure issues are set out as follows. Reference to developer contributions includes section 106 agreements and / or the proposed Community Infrastructure Levy.

Water supply and waste water:

The review of consents for water abstraction from the River Itchen could be a major issue for Southern Water and require extra investment post 2016. The necessary infrastructure is being identified in more detail at a sub-regional level within the PUSH Integrated Water Management Study. It is likely to include water efficiency / water metering.

7.6 Impact Assessment

7.6.1 This section considers the available information in relation to the conservation objectives of the River Itchen SAC.

Objective 4: The geographical distribution of the habitats and their overall area within the sites should be maintained or increased

7.6.2 The area of *Ranunculus* water-crowfoot vegetation within the SAC, and its distribution within the river environment is threatened by low water flows, particularly within summer months. Southern Water, Natural England, the Environment Agency and Ofwat are working together to agree suitable measures for ensuring a 'hands-off' level of water flow can be maintained year-round. However, measures must be sustainable; it will not be acceptable to simply shift the problem to the River Test, which is itself a Site of Special Scientific Interest.

Objective 5: The mix of species (their species structure) and the ecological inter-relationships between these and other environmental and management factors (ecological function) which are needed for the long-term maintenance of the habitats should be likely to continue to exist

7.6.3 The species structure and their ecological interrelationships are highly water dependent. The flow regime will directly affect dissolved oxygen levels, vegetative structure, food availability, competition, breeding success and migration. The long-term maintenance of the habitat, its ecological function and relationship with typical species is threatened as long as there is uncertainty over the maintenance of minimum flow levels.

Objective 6: The conservation status of the habitats' typical species are maintained in terms of their population size, range and habitat extent

7.6.4 Both Annex 2 species and typical species (see Chapter 3) are vulnerable in terms of their population size, range and habitat extent unless suitable measures for maintaining a 'hands-off' flow can be agreed.

7.7 Conclusions and Recommendations

7.7.1 As all development that comes forward within the City Centre will need to be in accordance with the Core Strategy as well as the CCAP, there is a good degree of confidence that water efficiency measures within new dwellings will be secured. Coupled with Southern Water's programme of universal metering (which applies to all new development, as well as retrospectively, to achieve 90% coverage by 2015), the Core Strategy's water efficiency standards of 105 litres per person per day to 2015, and 80l/p/d from 2016, are already considered good practice. No further measures for demand management through the CCAP are realistically achievable.

7.7.2 Furthermore, Natural England has recently provided new advice on the relationship between the overall supply of water in the relevant water resource zone, and abstractions from the Rivers Test and Itchen (pers. comm., 2013):

'The deliverability of public water supply for the area will be assessed in the Water Resource Management Plan [for AMP6], which will also be subject to HRA. This is the stage at which the impacts of supply on the integrity of the SAC will be considered. Therefore, because this will be considered as part of the WRMP, it is possible to screen out this issue for the purposes of the CCAP HRA.

'However, this is subject to the council putting in place measures to improve sustainability of water use in the CCAP area. This water resource management zone is water stressed with high consumption rates, and much of the supply is drawn from the Test and Itchen. For these reasons we would expect the council to ensure new homes in the area achieve at least code 3 or above for water use, in order to mitigate for any increases in water stress caused by new housing. We would also advise that all new housing should be connected to mains sewage to ensure no adverse effects on the SAC due to diffuse pollution.'

- 7.7.3 The Core Strategy policy on water efficiency, with which CCAP development proposals will need to be in conformity, are sufficient to meet these requirements. It can be concluded that there will be no adverse effects on the River Itchen SAC as a result of increasing water demand within the City Centre, and that the plan is Habitats Regulations compliant..

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8 Mobilisation of Contaminants

8.1 Baseline Conditions

8.1.1 The current tidal flood hazard in the City Centre is relatively low at present, but sea level rise will significantly increase both the extent and depth of flooding and the hazard over the lifetime of development promoted by the CCAP. **Figure 8.1** below depicts the risk of overtopping of the sea frontage by a storm surge event with a 1 in 200 year average recurrence interval in present and future years to 2115, taking account of sea level rise due to climate change. It can be seen that well over half of the City Centre area is at risk by 2115.

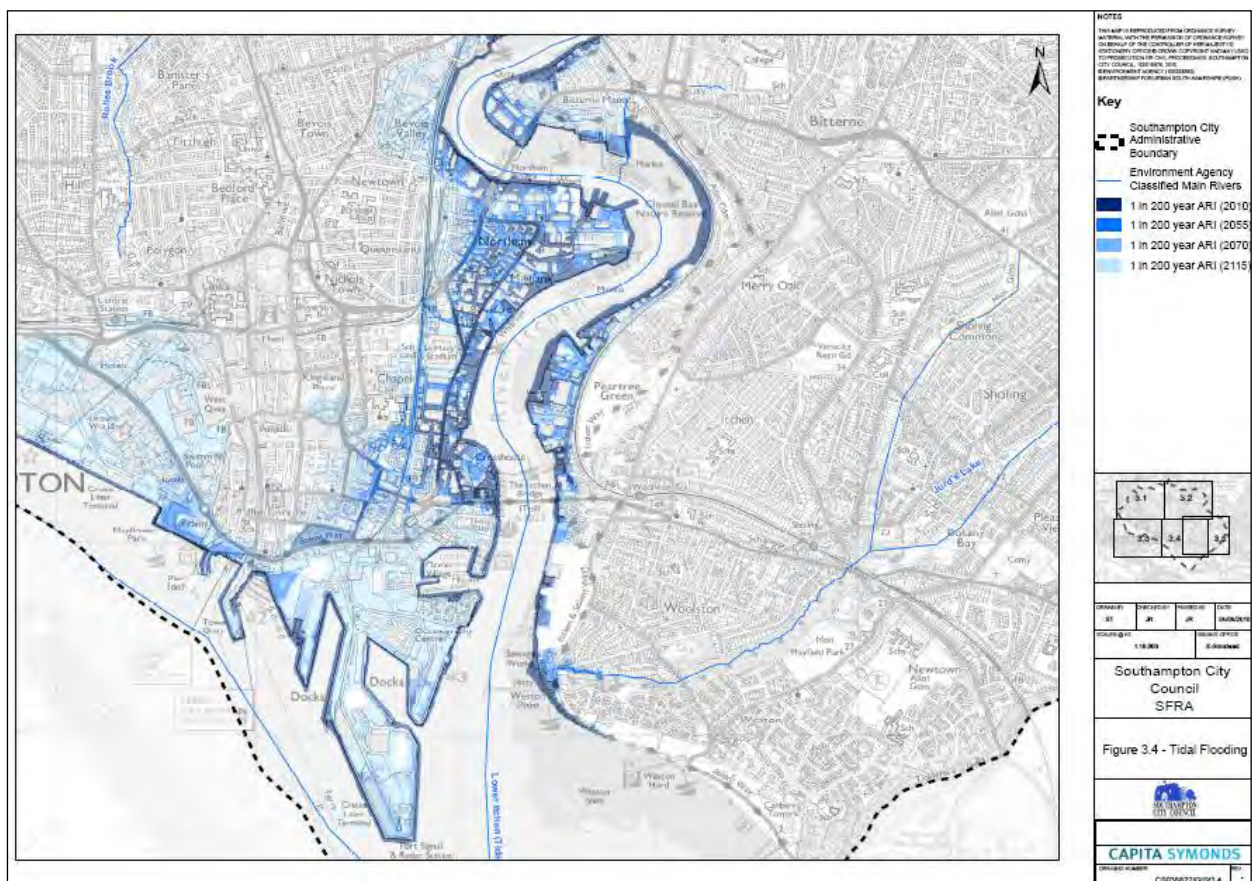


Figure 8.1: Tidal flood risk to the City Centre in years 2010, 2055, 2070 and 2115. Map depicts areas in Flood Zone 3 in each of these years . (Source: Capita Symonds, 2010)

8.1.2 The North Solent Shoreline Management Plan (SMP; NFDC, 2010) recommends a long term policy of ‘hold the line’ (HTL) for urban and industrial areas of the SMP shoreline, including the sections of frontage that fall within the City Centre area. 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).

- 8.1.3 Beneath the North Solent SMP there are two further strategies that focus on delivery of SMP policy, covering more localised stretches of shoreline in Southampton. Both of these, and their subsequent projects, are subject to HRA:
- ▶ Coastal Defence Strategy (CDS) for the River Itchen, Weston Shore, Netley & Hamble, which addresses the eastern bank of the Itchen and Southampton Water shoreline through to Hamble; and
 - ▶ Redbridge to Woodmill Lane Coastal Flood and Erosion Risk Management Strategy (CFERMS) which incorporates the western bank of the Itchen and City Centre frontage.
- 8.1.4 The boundary of the City Centre area is not adjacent to any internationally designated habitats. However, the area's eastern boundary is co-terminous with the western bank of the River Itchen (undesigned, but gateway to River Itchen SAC), and the Solent and Southampton Water SPA / Ramsar site boundary reaches over the eastern bank and approximately mid-way across the river. Impacts on water quality can be caused by polluted surface water runoff. There is a potential pathway for this impact to occur if works carried out during construction of flood defences mobilise historic contamination which then flows directly or indirectly into the waters of designated sites.
- 8.1.5 As stated in the Level 2 SFRA for Southampton, *'flooding of contaminated land... will transport contaminants such as organics and metals to vulnerable receptors if the respective drainage systems are not designed to treat the water'* (Capita Symonds, 2010: Volume 2, Appendix 5, p.5-11). However, it also states that *'SCC is extensively serviced by surface water, foul and combined sewers. Unless new development is to be located directly adjacent to a watercourse (including the River Test and River Itchen), it is likely that development runoff will discharge to the local sewer network, and potentially the ABP pump stations'* (Capita Symonds 2010: Volume 1, p.38). Surface water flood risk and associated impacts are being managed by the City's Surface Water Management Plan, which has also been subject to HRA.
- 8.1.6 Development brought forward under the CCAP could result in pathways for surface water contamination to affect the integrity of the Solent and Southampton Water SPA / Ramsar and River Itchen SAC, as identified in the Core Strategy HRA in relation to the CCAP's parent policies, CS1 and CS2. The latest preferred site boundaries for key development areas within the CCAP are shown in **Figure 8.2**.

8.2 Impact Source

- 8.2.1 The screening exercise revealed that proposed policy 27 (Town Depot) was likely to include flood risk management measures which could potentially mobilise contaminants through surface water run-off. This corresponds to site 12 in Figure 8.2.
- 8.2.2 Natural England and the Wildlife Trust requested that policy 36 (Ocean Village) also be included in this part of the assessment. This corresponds to site 8 in Figure 8.2.

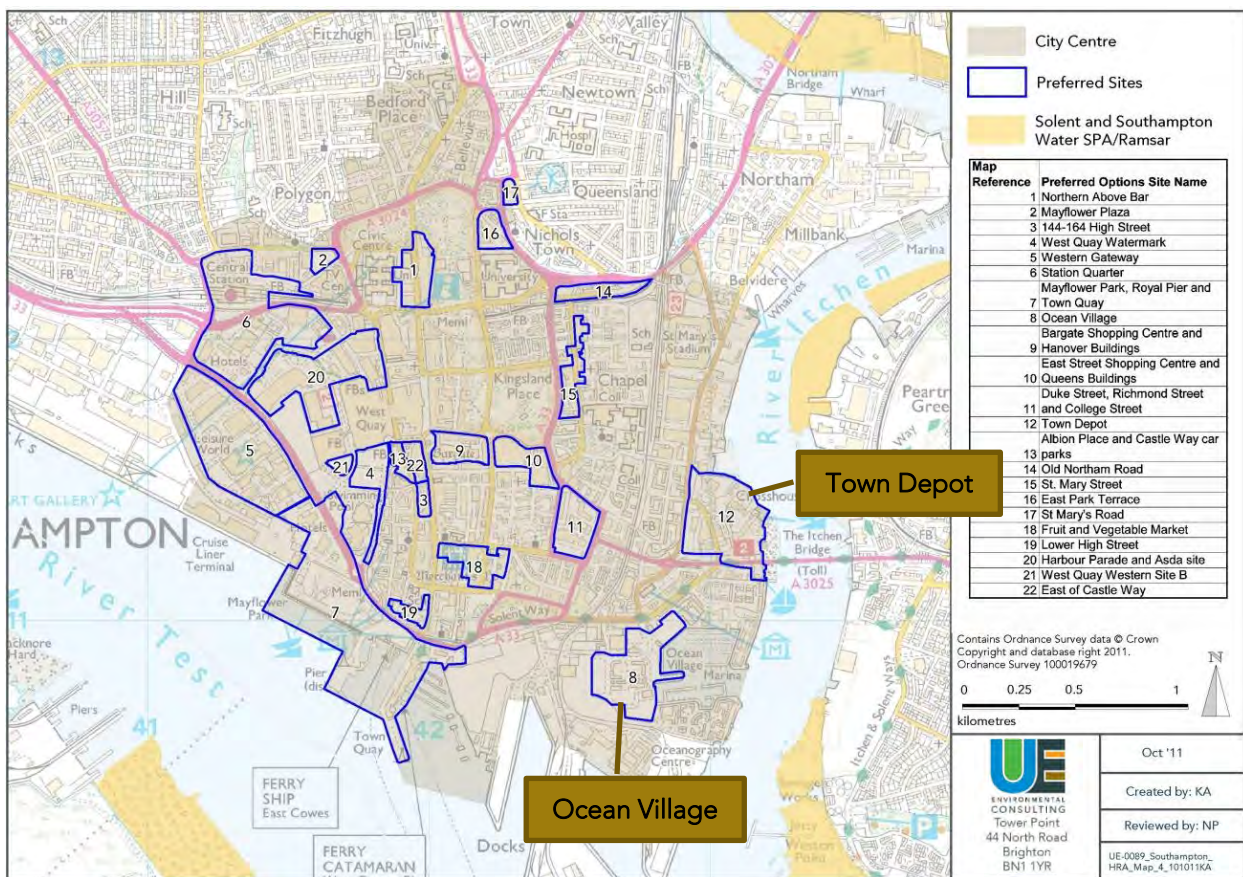


Figure 8.2: Latest preferred site boundaries for the CCAP (Source: SCC)

8.3 Impact Pathway

8.3.1 The nature of potential impacts are set out in relation to Solent and Southampton Water SPA / Ramsar by English Nature (2001), whose detailed operations advice for these sites describes how such contaminants can impact on qualifying species. In the case of the Solent and Southampton Water SPA / Ramsar, contaminants can build up in the food chain, resulting in toxic effects on birds and their prey. In relation to the River Itchen SAC, there would be potential for contamination to affect Atlantic salmon as they migrate from their spawning ground in the SAC to Southampton Water (English Nature, 2001).

8.3.2 The SFRA2 notes that the highly urbanised nature of Southampton and its underlying geology mean large volumes of surface water runoff can be generated (Capita Symonds 2010: Volume 1). It also refers to the risk that 'construction works involving earth movement and excavations and the use of plant adjacent to the river has the potential to generate contamination pathways if contamination is present in these areas' (Capita Symonds 2010, Volume 3, p.A8). Construction works of this type could be associated with waterfront development and/or flood defence works carried out to ensure protection of such development. Although the SMP notes that its HTL policies will provide protection from contaminants that may otherwise be released into coastal waters as a result of tidal flooding and erosion (NFDC, 2010), the risk that the flood defence works themselves could mobilise contaminants is an important issue for consideration at the site level.

- 8.3.3 In relation to the risks associated with pollution from surface water runoff, the SFRA2 highlights a lack of data on contaminated land from readily accessible sources, but observes that current uses of the land next to the River Itchen suggests there may be potential for contamination (Capita Symonds, 2010). In order to inform the assessment of surface water runoff, additional data on historic contamination is therefore required prior to redevelopment.
- 8.3.4 Ocean Village, as a strategic development, is almost entirely built out, but is included in the CCAP to facilitate appropriate development of sections of the site that remain. Planning applications for a new hotel (previously permitted already) are currently being considered by the Council. However, construction impacts could operate cumulatively with other developments in the area such as Centenary Quay on the opposite shore at Woolston. Other mixed uses may also be accommodated such as offices, food and drink, leisure, water-based recreation, marina related events, residential and a publicly accessible waterfront. Previous uses onsite included warehousing, storage, car parking and dock-related uses, while the old Inner Dock was infilled with landfill⁶; the potential for historical contamination seems reasonably high. The northern part of the site is traversed by provisional proposals for strategic flood defence in the form of 'de-mountable flood structures incorporated within existing urban fabric'. The site is approximately 450m west of the nearest areas of designated mudflat, which front Centenary Quay.
- 8.3.5 The Town Depot site, currently vacant, is earmarked for mixed uses including leisure, food and drink, residential, offices, hotel, retail or other uses, a slipway, watersport facilities and a publicly accessible waterfront. The potential for historical contamination seems reasonably high. The site is also intersected by the strategic flood defence measures outlined in the City Centre Masterplan (David Lock Associates, 2011). Provisional plans for the defences include 'flood defences incorporated into elevated road infrastructure' and 'flood defences incorporated into new urban landscapes'. The site is approximately 250m to the southwest, and 450m to the northwest of the nearest designated areas of mudflat on the other side of the river.
- 8.3.6 Bank re-profiling, either to meet development objectives (such as improved access to the waterfront) or to improve flood defences, could therefore lead to short-term changes in water quality in the intertidal zone via re-suspension of silt and any contaminants present in the foreshore. The risk would be equally prevalent during remediation of either site prior to redevelopment.
- 8.3.7 Locally released contaminants could potentially affect the survival of individual birds utilising areas outside of the SPA, particularly those foraging on intertidal areas such as waders and wildfowl. The effects could be created either through mortality of fish and invertebrate prey or marine algae. There would also be a low risk of contaminations via prey species. Similar effects could impact salmonid populations associated with the River Itchen SAC. The effects of localised contamination would likely be very short-term because of the dilution influence of the next high tide, limiting impacts to benthic prey.

⁶ Environment Agency "What's in your backyard?" [accessed 19/10/11]:

http://maps.environment-agency.gov.uk/wiyby/wiybyController?ep=maptopics&lang=_e

- 8.3.8 Atlantic salmon and sea trout are known to migrate through large rivers and estuaries by remaining close to the coastline. This may be less relevant for the preferred site at Ocean Village but could still be significant for the Town Depot redevelopment. Migrating adult salmon may avoid waters with high silt loads, or delay migration when such silt loads are unavoidable (Bash *et al*, 2001). Construction works in or adjacent to the intertidal would need to be planned carefully and undertaken outside of the key periods when migration takes place. Migrations can happen at any time of year, but key periods are thought to be between June and August (adolescent fish returning to the Itchen; Solomon, 2002), October to December (adults returning to spawn; Cowx and Frazer, 2003) and late March to May (smolts – juvenile fish – migrating seaward; Solomon, 2002).

8.4 Offsetting Measures Provided within the Plan

- 8.4.1 There are no policies within the CCAP that address potentially contaminated land and how redevelopment should address it. However, wider planning policy and regulation (e.g. National Planning Policy Framework, Annex 3) require the extent of contamination within a site to be assessed and remediated prior to redevelopment. Additionally, the Local Plan saved policy SDP22 contains generic policies to address contamination.

8.5 Impact Assessment: River Itchen SAC

- 8.5.1 This section considers the available information in relation to the conservation objectives of the River Itchen SAC, but only in relation to Atlantic salmon. All other features are excluded because they are freshwater and non-migratory, except otter. Otter is known to range widely and make use of estuarine environments, but it is mainly confined to freshwater habitats in England and Wales (Chanin, 2003).

Objective 4: The geographical distribution of the habitats and their overall area within the sites should be maintained or increased

- 8.5.2 The area of habitat use by salmon within the SAC will not be affected.

Objective 5: The mix of species (their species structure) and the ecological inter-relationships between these and other environmental and management factors (ecological function) which are needed for the long-term maintenance of the habitats should be likely to continue to exist

- 8.5.3 Maintenance of the habitats within the SAC, and their species structure and function, will not be affected.

Objective 6: The conservation status of the habitats' typical species are maintained in terms of their population size, range and habitat extent

- 8.5.4 Release of contaminants into the lower reaches of the Itchen could negatively impact on populations of Atlantic salmon, possibly leading to mortality in severe cases, but probably on a very local, short-term basis.

- 8.5.5 Re-suspension of solids during construction works, leading to increased turbidity, could delay the migration of salmon upstream to spawning areas, or indeed downstream and onward to the sea. This would constitute a temporary range contraction and could conceivably delay breeding, although the impact would likely be short-term and reversible.

8.6 Impact Assessment: Solent and Southampton Water SPA/Ramsar

- 8.6.1 This section considers the available data in relation to the conservation objectives of the Solent and Southampton Water SPA/Ramsar.

Objective 1: Maintain the population of each of the Annex 1 and migratory bird species as a viable component of their natural habitats on a long-term basis

- 8.6.2 Population-scale impacts to Annex 1 or migratory bird species within Solent and Southampton Water SPA/Ramsar would be unlikely, although mortality to individuals as a result of a severe event cannot be ruled out. The impact is likely to be short-term and reversible.

Objective 2: Maintain the range (geographic extent) of the population of each of the Annex 1 and migratory bird species for the foreseeable future

- 8.6.3 Very short-term reductions in available foraging habitat (although outside of the designated areas) are possible, but reversible.

Objective 3: Maintain sufficient area of suitable habitat to maintain the populations of each of the Annex 1 and migratory bird species on a long term basis

- 8.6.4 It is likely that sufficient area of suitable habitat to maintain the populations of Annex 1 or migratory birds would remain on a long-term basis.

8.7 Conclusions and Recommendations

- 8.7.1 Recommendations to ensure that effects from mobilisation of contaminants can be avoided are listed in **Table 8.1**. The CCAP, through a delivery and development management policy, and/or the Southampton Development Plan DPD, should require that applications for development at Town Depot and Ocean Village comply with these recommendations. Once the recommendations are incorporated within or referred to by the CCAP, it can be concluded that the plan is Habitats Regulations compliant.

Table 8.1: Recommendations for avoiding effects through mobilisation of contaminants

Avoidance/mitigation of effects in general

Redevelopment sites on the waterfront that include potentially contaminating or remediation works, and work to foreshore, should be informed by suitable Site Investigations for contamination, project level HRA and a Construction Environmental Management Plan. The contents of the latter should be agreed with the City Council, Natural England and Environment Agency, and contain best practice measures to reduce and manage the risk of contaminant release (e.g. the Agency's Pollution Prevention Guidelines, working 'in the dry', temporary mobile walling, etc.).

Additional avoidance/mitigation of effects on River Itchen SAC

Redevelopment sites on the waterfront requiring work to the foreshore should be undertaken outside of the key migration periods for Atlantic salmon (see **section 8.3.8**) and by agreement with the City Council, Natural England and Environment Agency.

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9 Loss or Degradation of Wader Roosts

9.1 Baseline Conditions

9.1.1 Development may result in the actual or functional loss of areas outside European site boundaries which are nonetheless important to the integrity of the sites if the population stability of species for which the site was designated is shown to have a critical reliance on the use of such supporting areas. Examples include foraging areas for Brent geese, or roosting sites for wading birds, at high water when the intertidal areas within European sites are submerged.

9.1.2 Development can have a range of impacts on birds using offsite roosting and foraging sites. These impacts relate to increased perceived predation risk as a result of over-illumination, noise and disturbance from human activity, decreasing sight lines and overshadowing (see **Chapter 10** for this group of impacts), as well as the risk of actual loss of off-site foraging or roosting habitat due to building footprints.

9.1.3 The 2010 Solent Waders and Brent Goose Strategy (King, 2010) identifies the most important sites in this respect, which should be safeguarded from development wherever possible: *'The underlying principle is to, wherever possible, conserve extant sites and to create new sites, enhancing the quality and extent of the feeding and roosting resource'* (King, 2010, p.7). The following bullets provide a description of the main characteristics of foraging areas for Brent geese and roosting sites for wading birds, as described in the Strategy.

- ▶ In relation to Brent Geese, *'the suitability of sites... depends on distance from the coast, the size of the grazing area, the type of grassland management, visibility and disturbance. Brent geese prefer large open sites where they have clear sight lines and short, lush grass for grazing. They use a great deal of energy travelling between feeding areas, so tend to preferentially select sites adjacent to the coast.'*
- ▶ In relation to wading birds, *'Natural roosting sites include saltmarsh areas, shingle banks and coastal grasslands. Waders are also known to roost on man made structures such as boats, wharfs, jetties and piers. Roosting sites tend to be close the coast, perhaps no more than 100 metres from mean high water. They are usually situated away from sources of disturbance, such as housing and industry, and have good visibility. Like Brent geese, particular preferences for certain sites are not yet fully understood.'*

(King, 2010, pp.4-5)

9.1.4 The survey considered a study area comprising sites across the urban matrix and countryside surrounding the Solent. The methodology for the updated Strategy considered all Brent Goose and Wader sites known to be used in the past or considered potentially suitable, due to their location or habitat, based on the knowledge of local bird experts and ecologists.

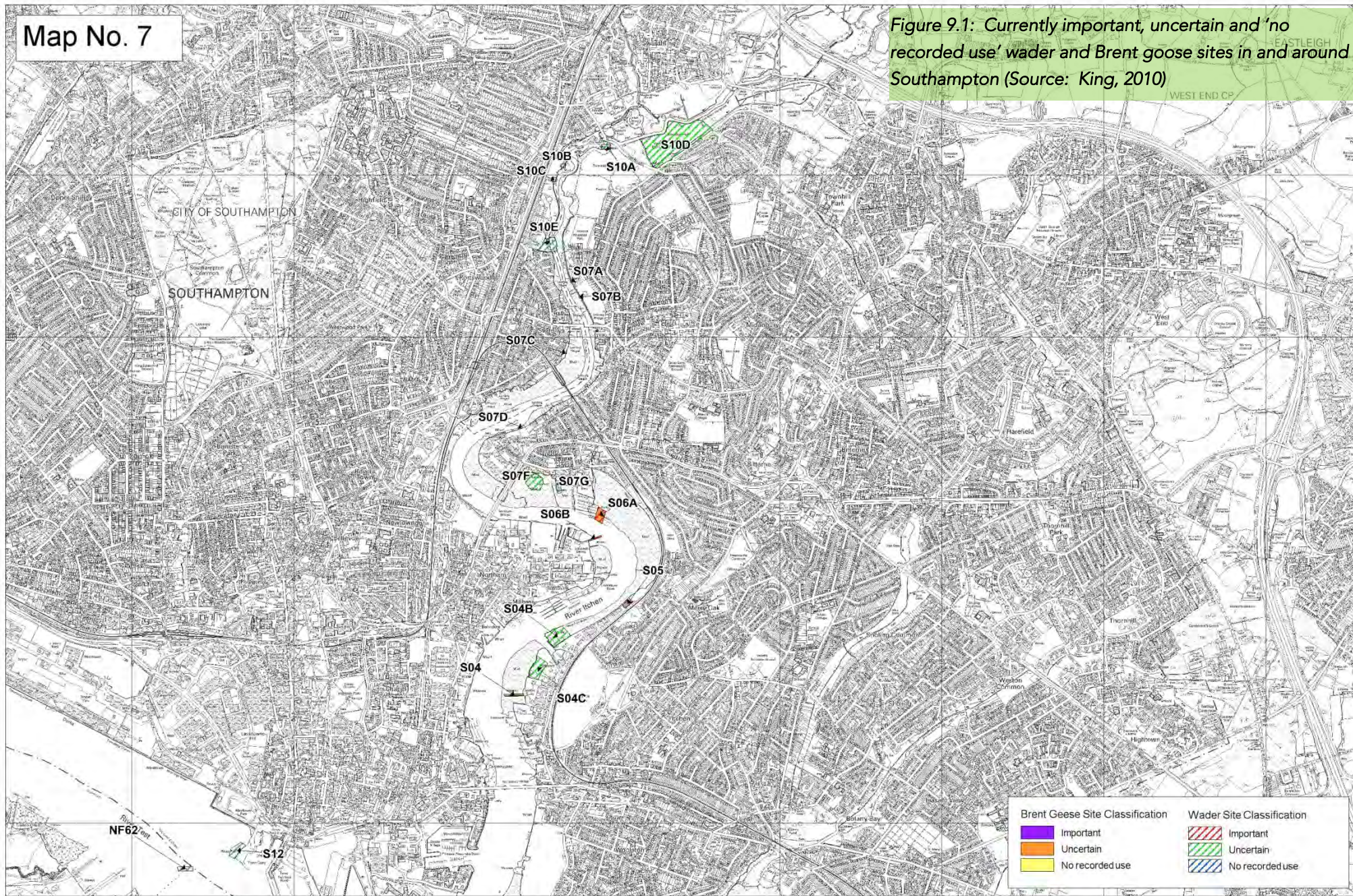
- 9.1.5 For Brent Geese, the Strategy identifies sites according to maximum count and frequency of use. For wading birds, sites are identified according to the maximum count of waders on a given day, the significance of the site for a particular species, and the number of different species recorded on the site. The current sites are classified into those that are important, uncertain or with no recorded use. Further analysis of currently important sites identifies those that are vulnerable to loss as a result of development, sea level rise or coastal realignment. The Strategy also identifies sites that have potential to be important in the future, taking account of the site characterisation analysis carried out for the study.
- 9.1.6 Currently important sites in and around Southampton, as well as those which are uncertain or have no recorded use are shown in **Figure 9.1**. Just off this map to the southwest of the City Centre (around 500m from the Ocean Village preferred site) is the jetty at Weston Point, classified as important for both waders and Brent geese. As can be seen there are no currently important sites for either Brent goose or waders within the City Centre area. There is one wader roost classified as uncertain at Royal Pier. Uncertain sites may still be relied upon by birds and the classification only points to the need for additional survey work to confirm their status.

9.2 Impact Source

- 9.2.1 The screening assessment found that the planned major development site at Royal Pier could result in the actual or effective loss of the site as a high-tide roost for wading birds. It also noted that the site has not been identified as a potentially suitable future site in the Strategy. Nonetheless, proposed policy 24 was taken forward for Appropriate Assessment.
- 9.2.2 In its consultation response to the screening findings, the Wildlife Trust stated that:
- “Regarding Brent geese and waders there are known sites of importance on the River Itchen, in particular the Weston Point jetty opposite Empress Dock. There are also sites shown as uncertain by Spitfire Quay [one for both waders and Brent geese, a further two for waders only]. Whilst these are on the opposite side of the river Itchen to the AAP we believe they should be considered. In addition you point out major development at Royal Pier could result in the loss of a high tide roost for wading birds, as such we would wish to see Loss of supporting habitat, for waders in particular, screened in and assessed as part of the HRA.” Pers. comm. (2011b)*
- 9.2.3 As stated above, the Weston Point jetty is c.500m from Ocean Village preferred site (policy 36), whereas the nearest Spitfire Quay site is c.350m from Town Depot preferred site (policy 27) and also within the SPA/Ramsar. These two additional policies are also therefore taken forward for AA, but addressed in **Chapter 10**.

Map No. 7

Figure 9.1: Currently important, uncertain and 'no recorded use' wader and Brent goose sites in and around Southampton (Source: King, 2010)



Current Use Analysis: Important Sites for Waders and Brent Geese

Maps produced by Hampshire and Isle of Wight Wildlife Trust on behalf of the Waders and Brent Goose Strategy Group. (Ordnance Survey licence no. 100015632) with permission of Her Majesty's Stationery Office. Crown Copyright 2010.

9.3 Impact Pathway

- 9.3.1 Proposed uses at Royal Pier (the site boundary for which includes Mayflower Park and Town Quay) include a major mixed use development comprising cultural and leisure attractions, food and drink, speciality retail, employment, residential and hotel uses, public open space, marina/moorings and a publicly accessible waterfront. The City Council chose a preferred developer for the site early in 2011 and provisional plans would appear to include a landmark tall building close to the waterfront (see **Chapter 10**) and demolition of the pier.
- 9.3.2 The wader roost is just under 0.5ha in size and, although it was only surveyed once during preparation of the Brent Goose and Wader Strategy, appears to be utilised by one species only, namely oystercatcher. The maximum (only) count for this species was 11 individuals. The site has not been included in the Strategy as a potentially suitable future site.

9.4 Offsetting Measures Provided within the Plan

- 9.4.1 No measures to offset the impacts of lost wader roosts of uncertain importance are included within the CCAP.

9.5 Impact Assessment

- 9.5.1 Wader and Brent goose sites addressed by the Strategy are thought to contribute to the overall conservation status of the suite of Solent European Marine Sites, including Solent and Southampton Water SPA/Ramsar, Portsmouth Harbour SPA/Ramsar and Chichester and Langstone Harbours SPA/Ramsar. The populations of some species along the Solent coastline are highly dynamic in their choice of feeding or roosting sites as birds commute to make use of various areas at different times of day or year. However, oystercatcher (an Annex 2 (migratory) species) only appears on the citation for one of these sites, Chichester and Langstone Harbours Ramsar. It is suggested that the loss in Southampton of a small roost for oystercatcher of uncertain importance would be unlikely to affect the ecological integrity of the Ramsar, although forthcoming results from the SDMP will help to confirm this.

Objective 1: Maintain the population of each of the Annex 1 and migratory bird species as a viable component of their natural habitats on a long-term basis

- 9.5.2 The Chichester and Langstone Harbours population of oystercatcher is unlikely to be affected by the loss of Royal Pier.

Objective 2: Maintain the range (geographic extent) of the population of each of the Annex 1 and migratory bird species for the foreseeable future

- 9.5.3 The oystercatcher's range is unlikely to be affected.

Objective 3: Maintain sufficient area of suitable habitat to maintain the populations of each of the Annex 1 and migratory bird species on a long term basis

9.5.4 It is likely that sufficient area of suitable habitat to maintain the populations of oystercatcher would remain on a long-term basis.

9.6 Conclusions and Recommendations

9.6.1 Notwithstanding this assessment, it is important to note the uncertainty regarding the status of Royal Pier as a roost for wading birds. It is suggested that the following measures are required of the developer for this site (see **Table 9.1**) on a precautionary basis. These should be included within CCAP policy, or at least the supporting text, and would allow redevelopment of the site that adheres to the requirements to proceed. Once the recommendations are incorporated within or referred to by the CCAP, it can be concluded that the plan is Habitats Regulations compliant.

Table 9.1: Avoidance and mitigation measures for loss of wader roost

Avoidance/mitigation of effects from loss of wader roost

Redevelopment of preferred site 7 (Mayflower Park, Royal Pier and Town Quay) should be informed by further surveys to establish the status of Royal Pier in terms of its importance as a wader roost. If it can be classified as important currently, or potentially suitable in the future, the roost should be retained. If the roost cannot be retained, it should be re-provided to at least the same size and quality as part of the redevelopment (for example, either onsite or via a floating pontoon).

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10 Collision Risk, Light, Noise and Vibration

10.1 Baseline Conditions

- 10.1.1 Collision risk and light pollution are interrelated to an extent (because birds can become attracted or entrapped by light) and tall buildings in particular can present a risk to birds when migrating or commuting between roosting and foraging areas. The potential for impact is influenced by the location and design of new buildings and their surrounding amenity (such as landscaping and security lighting). Noise and vibration impacts can alter the behaviour of both birds and fish, and result in avoidance of otherwise suitable habitats potentially creating a barrier to movement. The location, timing and construction methods for new developments are key determinants in the scale of potential impacts. Light pollution impacts can also occur by influencing food availability on a very local scale, but this is not considered further during the assessment because the City Centre does not share a frontage with any European designated areas.
- 10.1.2 Collision risk and noise impacts from construction and operation of development brought forward by the CCAP 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 CCAP area's eastern waterfront has the potential to cause noise and vibration impacts on fish assemblages that support the Solent and Southampton Water SPA/Ramsar, and migrating salmon on their way to/from River Itchen SAC. In particular, certain uses are likely to necessitate construction of new or reinforced flood defences, which may be very close to the water's edge.

Collision risk

- 10.1.3 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, whether as a result of their location, height or associated light pollution. 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).
- 10.1.4 The study carried out surveys and analysis to help fill the data gap on the risk of collisions with tall buildings in relation to bird species of importance for the area's European designated sites. After a pilot study to determine the number and positioning of observers and to establish the most efficient data recording methodology, the researchers conducted a series of surveys between December 2008 and March 2009 in three main survey areas around the city: River Test, River Itchen and the CCAP area, to track the movements of species comprising the bird assemblage, as listed below:
- ▶ Gadwall *Anas strepera* (not observed)
 - ▶ Teal

- ▶ Ringed plover
- ▶ Little grebe *Tachybaptus ruficollis*
- ▶ Cormorant *Phalacrocorax carbo*
- ▶ Wigeon
- ▶ Pintail (not observed)
- ▶ Red-breasted merganser
- ▶ Lapwing *Vanellus vanellus*
- ▶ Curlew
- ▶ Black-tailed godwit
- ▶ Great crested grebe *Podiceps cristatus*
- ▶ Dark-bellied Brent goose
- ▶ Redshank
- ▶ Shoveler (not observed)
- ▶ Grey plover
- ▶ Dunlin
- ▶ Shelduck

10.1.5 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. 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 CCAP area were limited, although there were some flight lines close to the CCAP area.

10.1.6 The majority (91%) of waterfowl were observed to be flying close to or below the height of surrounding buildings, described as 'within the building height zone'. This included 2,180 (16%) that were found to be flying within the building height zone on a flight line that intersected with building outlines, as defined by Ordnance Survey MasterMap. The birds' distance from buildings was also measured, and it was found that 99.9% were flying within 500 metres, 65% within 200 metres, 55% within 100 metres and 32% within 50 metres of a building footprint.

10.1.7 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 10.1** below provides a 3D plot showing the relative density of waterfowl movements in relation to buildings within the CCAP study area, thereby encapsulating the findings that are of primary importance when considering the implications of the CCAP for the purposes of HRA.

10.1.8 Where sufficient observational data was gathered for individual species, Chapter Four of the GeoData Institute report (2009) provides species-specific analyses of its findings. Of particular relevance are the findings relating to species found to fly in close proximity to, or over, the City Centre area, which raises the potential for collisions to occur. The results for those species seen flying in closest proximity to the CCAP area are briefly summarised below:

- ▶ Dark-bellied Brent goose was observed flying in close proximity to the City Centre, especially along the lower Itchen, and skirting the docks at Redbridge (mapped results in Section 4.4 of the report). The majority were flying within the building height zone. However, their flight paths were generally confined to movements up and down the river corridor, and tall buildings are not proposed on the banks of the lower Itchen.
- ▶ Little egret *Egretta garzetta* was observed flying close to the CCAP area along the Itchen and the dock estate at Redbridge. There was also a flight line that crossed over the city between Shamrock Quay and Northam, which is however north of the CCAP area

(mapped results can be seen in section 4.10 of the report). As numbers were very low and no flight paths crossed the CCAP area boundary, it is not thought likely that waterfront development would present a hazard.

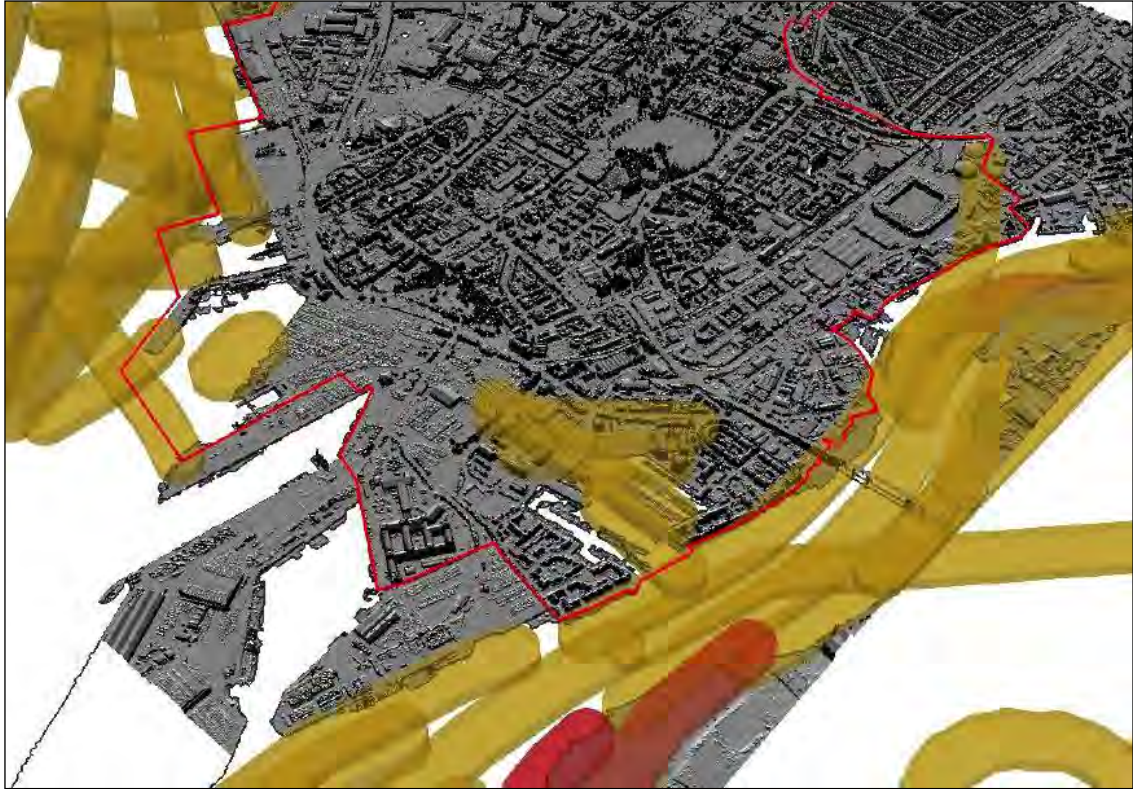


Figure 10.1: Waterfowl assemblage - birds in building height zone (Source: GeoData Inst, 2009)

- ▶ Mediterranean gull was observed along flight lines close to the Itchen Bridge, along the eastern bank of the River Itchen opposite the CCAP area, and also at Hythe Marina and Redbridge (mapped results are presented in section 4.7 of the report). However, these movements were confined to the river channel and not considered close enough to be subject to the risk of collision with development associated with the CCAP.
- ▶ Black-headed gull was numerous and 14% of the total (4,962 birds) were observed flying within the CCAP area. There were also significant movements on flight lines along the Test and Itchen rivers, which related to evening movements of birds to roost (mapped results are presented in section 4.8 of the report). Regarding collision risks to gulls, the report notes, '*it is difficult to determine whether these birds are actually at risk of colliding with buildings because they have increasingly adapted to the urban landscape, which closely resembles the cliffs of their natural habitats and urban locations are increasingly their chosen breeding grounds*' (GeoData Institute, 2009, p.66).

Noise and vibration

- 10.1.9 There is little freely available data regarding the present extent of noise pollution within the City, although comparative information is available at a national scale courtesy of the Campaign to Protect Rural England through its tranquillity mapping project (Jackson *et al*, 2008); see **Figure 10.2**. However, it should be possible to carry out detailed assessment at site and project

level once comprehensive site layouts, construction methods and equipment to be used are known.

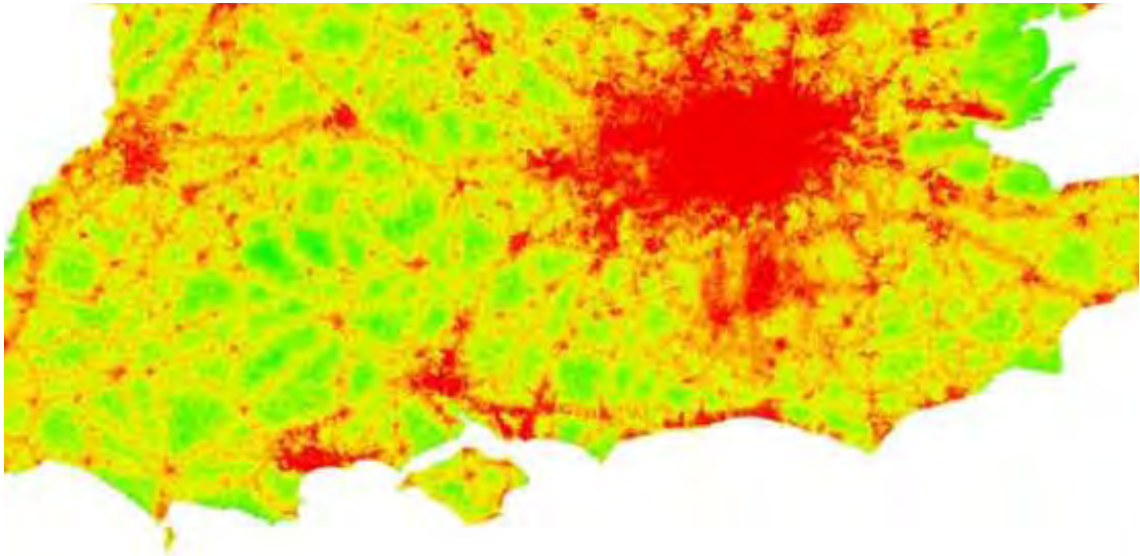


Figure 10.2: Relative tranquillity in southern England (Source: Jackson et al, 2008)

10.2 Impact Source

- 10.2.1 The screening assessment found that proposed policies 17 (Tall Buildings, including at the Western Gateway) and 24 (Mayflower Park and Royal Pier) would be likely to lead to collision mortality risk through their promotion of tall landmark buildings close to bird commuting routes. It also found that proposed policies 24 (Mayflower Park and Royal Pier) and 27 (Town Depot) would be likely to generate noise and vibration impacts because they are the closest areas to parts of Solent and Southampton Water SPA/Ramsar site and adjacent to the River Itchen (gateway to the River Itchen SAC upstream).
- 10.2.2 In their consultation responses to the screening assessment, Natural England and the Wildlife Trust requested that proposed policy 36 (Ocean Village) also be included in the assessment. It is assessed for both collision risk and noise and vibration impacts in the sections below.
- 10.2.3 The Western Gateway preferred site boundary is shown as site 5 on **Figure 10.3**, while Mayflower Park and Royal Pier preferred site is site 7, Town Depot is site 12 and Ocean Village is site 8.

10.3 Impact Pathway

Collision risk

- 10.3.1 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. At night, birds can be disoriented or 'entrapped' by lights.

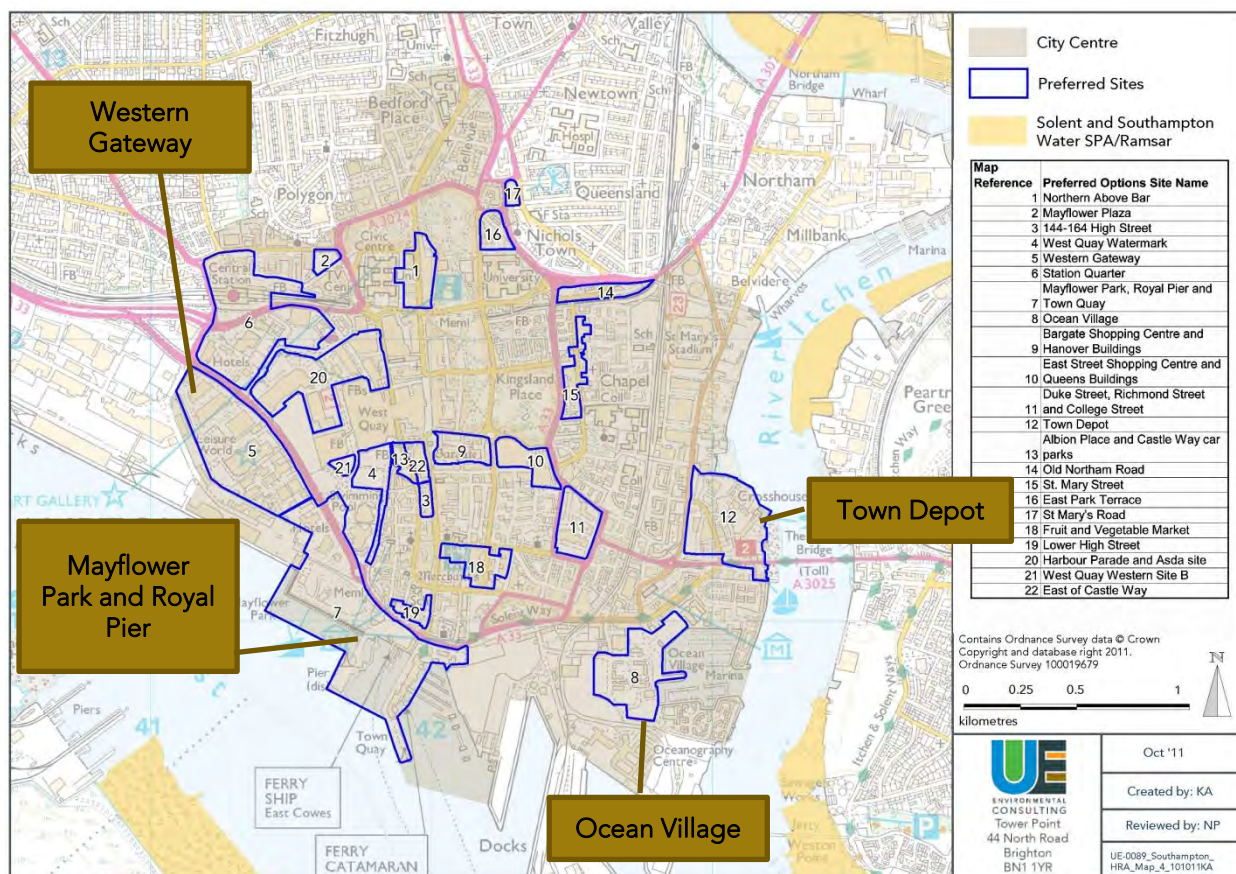


Figure 10.3: CCAP preferred sites (Source: SCC)

- 10.3.2 A bird within a lighted zone can 'become "trapped" and will not leave the lighted area. Large numbers of nocturnally migrating birds are therefore affected when meteorological conditions bring them close to lights, for instance, during inclement weather or late at night when they tend to fly lower. Within the sphere of lights, birds may collide with each other or a structure, become exhausted, or be taken by predators. Birds that are waylaid by buildings in urban areas at night often die in collisions with windows as they try to escape during the day.' (Longcore and Rich, 2004, pp.193-4).
- 10.3.3 Black-headed gull in particular, and the waterfowl assemblage in general, is known to frequently commute along the riparian corridors fronting the City Centre, with notable hotspots of activity intersecting with possible locations for tall buildings at the Western Gateway, Mayflower Park, Royal Pier and Town Quay, and Ocean Village sites; see **Figure 10.4** and **Figure 10.5**.
- 10.3.4 Depending on the actual height of buildings proposed for development, their location in relation to the surrounding topographical context, lighting and materials, there could be significant scope for increased mortality to birds as a result of these proposals.



Black-headed Gull - Flightpath Density Plot (Total Birds / Survey)

Figure 10.4: Black-headed gull flight density map (Source: GeoData Institute, 2009)



Waterfowl Assemblage - Birds in Building Height Zone

Figure 10.5: Waterfowl assemblage flight density map (Source: GeoData Institute, 2009)

Noise and vibration

10.3.5 Noise and vibration arising from construction of buildings, as well as noise-generating land uses, can impact on birds where sited in proximity to designated and off-site habitat. As stated in relation to the Solent European Marine Site, ‘many of the intertidal areas of the estuaries within the European marine site are... important nursery grounds for fish including bass, flatfish species and mullet’ (English Nature, 2001, p.14), an important resource for fish-eating birds such as such as red-breasted merganser and divers. The potential impacts of construction noise and vibration may also affect migrating Atlantic salmon, which are a qualifying species of the River Itchen SAC upstream, and could be affected by vibrations as they migrate from their spawning ground in the SAC to Southampton Water or vice versa (English Nature, 2001).

10.3.6 The statement to inform the HRA of the Centenary Quay development at Woolston refers to benchmarks for levels of disturbance to birds that may arise during site preparation and construction:

‘Very loud (defined as greater than 70 dB) and percussive noises have the potential to disturb birds, increasing time spent alert and in flight, reducing the available time 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 300 m. 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 the Humber Defences states that: ‘Sudden noise in the region of 80 dB appears to elicit a flight response in waders to 250 m from the source, with levels below this to approximately 70 dB causing flight or anxiety behaviour in some species.’ (Biodiversity by Design, 2008, p.79, quoting from the Environmental Statement for the Humber Estuary Tidal Defences: Urgent works, Paull to Kilnsea and Whitton to Pyewipe).

10.3.7 **Table 10.1** describes the location of Royal Pier, Town Depot and Ocean Village in relation to the nearest extent of Solent and Southampton Water SPA/Ramsar, as well as the important or uncertain (off-site) wader and Brent goose sites referred to in **section 9.2.3**.

Table 10.1: Approximate nearest distance (m) of development sites from important bird areas

Development site (map ref) (1)	Solent=Soton SPA/Ramsar N (2)	Spitfire Quay (3)	Solent=Soton SPA/Ramsar S (4)	Weston Jetty (5)
Town Depot (12)	250m	350m	450m	850m
Ocean Village (8)	760m	860m	450m	500m
Royal Pier (7)	570m	n/a	620m	920m

1. See Figure 10.3
2. The nearest extent of Solent and Southampton Water SPA/Ramsar to the north at Spitfire Quay, or south at Dibden
3. The nearest Spitfire Quay ‘uncertain’ wader and Brent goose site is within the SPA/Ramsar, the other two are further north
4. The nearest extent of Solent and Southampton Water SPA/Ramsar to the south: at Weston Shore, or at Dibden
5. An important wader and Brent goose site, crossing the SPA/Ramsar and jutting into open water

- 10.3.8 As can be seen, only Town Depot is within the potential noise impact envelope for birds, and then only for those birds using the southernmost parts of the SPA/Ramsar adjacent to Spitfire Quay. The uncertain wader and Brent goose sites (from the Wader and Brent Goose Strategy) would be unaffected even by very loud percussive piling on the Town Depot site according to Environment Agency standards used in the Humber Estuary. Ocean Village is much further from any of the potential bird habitat and in any case there is intervening built development which would help shield the sites from noise emission (i.e. it is not on the open water frontage).
- 10.3.9 Turning to migrating Atlantic salmon, the Centenary Quay Statement to Inform an Appropriate Assessment (Biodiversity by Design, 2008) estimated that maximum noise levels associated with piling in or adjacent to the river would be 128dB. It found that, without acoustic screening, the noise would decrease to 100dB at 10m, 88dB at 20m, and 82dB at 80m. It reported that fish begin to exhibit avoidance behaviour at 90dBht (a measure similar to db(A) which is used to assess noise impacts to humans). However, it also reported that experimental work in 2003 found no effect on the behaviour or physical health of fish (caged brown trout) at a distance of 25m, 50m 100m or 200m from vibro-piling operations carried out at Town Quay.
- 10.3.10 Nonetheless, impacts to migrating salmon are possible as a result of proposed development works at Town Depot, Ocean Village, and Mayflower Park and Royal Pier, without mitigation.

10.4 Offsetting Measures Provided within the Plan

- 10.4.1 No measures to offset the impacts of collision risk, noise or vibration are included within the CCAP.

10.5 Impact Assessment: Solent and Southampton Water SPA/Ramsar

Objective 1: Maintain the population of each of the Annex 1 and migratory bird species as a viable component of their natural habitats on a long-term basis

- 10.5.1 Collision mortality risk to Annex 1 or migratory birds as a result of policies 17 (Tall Buildings and the Western Gateway), 24 (Mayflower Park and Royal Pier) and 36 (Ocean Village) could lead to a reduction of local populations, especially black-headed gull, and on a long-term basis.

Objective 2: Maintain the range (geographic extent) of the population of each of the Annex 1 and migratory bird species for the foreseeable future

- 10.5.2 Construction noise from redevelopment at Town Depot (policy 27) could lead to a localised range contraction at the intertidal adjacent to Spitfire Quay, although the effect would be short-term and confined to the construction phase.

Objective 3: Maintain sufficient area of suitable habitat to maintain the populations of each of the Annex 1 and migratory bird species on a long term basis

- 10.5.3 Construction noise from redevelopment at Town Depot (policy 27) could also render parts of the intertidal habitat adjacent to Spitfire Quay unusable by Annex 1 or migratory birds for a limited period of time.

10.6 Impact Assessment: River Itchen SAC

- 10.6.1 This section considers the available information in relation to the conservation objectives of the River Itchen SAC, but only in relation to Atlantic salmon. All other features are excluded because they are freshwater and non-migratory, except otter. Otter is known to range widely and make use of estuarine environments, but it is mainly confined to freshwater habitats in England and Wales (Chanin, 2003).

Objective 4: The geographical distribution of the habitats and their overall area within the sites should be maintained or increased

- 10.6.2 The area of habitat use by salmon within the SAC will not be affected.

Objective 5: The mix of species (their species structure) and the ecological inter-relationships between these and other environmental and management factors (ecological function) which are needed for the long-term maintenance of the habitats should be likely to continue to exist

- 10.6.3 Maintenance of the habitats within the SAC, and their species structure and function, will not be affected.

Objective 6: The conservation status of the habitats' typical species are maintained in terms of their population size, range and habitat extent

- 10.6.4 Noise and vibration impacts from construction activities within the Town Depot, Ocean Village and Mayflower Park and Royal Pier sites (policies 24, 27 and 36) could negatively impact on populations of Atlantic salmon, by delaying the migration of salmon upstream to spawning areas, or indeed downstream and onward to the sea. This would constitute a temporary range contraction and could conceivably delay breeding, although the impact would likely be short-term and reversible.

10.7 Conclusions and Recommendations

- 10.7.1 Recommendations to avoid or mitigate impacts from collision mortality risk, noise and vibration as described in **Table 10.2**. These should be included within CCAP policy, or in the case of the final recommendation perhaps as part of a design brief (because the extent of impact and most appropriate solutions will not be known until detailed development plans are available. Once the recommendations are incorporated within or referred to by the CCAP, it can be concluded that the plan is Habitats Regulations compliant.

Table 10.2: Avoidance and mitigation measures for collision mortality risk, noise and vibration

Avoidance/mitigation of effects from noise and vibration

Very loud (>70dB) construction activities such as percussive piling should be planned into development programming to avoid the most sensitive times of year for salmon and the bird assemblage. Alternatively, it may be possible to avoid or reduce the impacts of these operations by using vibro-piling in favour of percussive piling.

Salmon

For salmon, sensitive times of year are key migration periods, which may include June to August (adolescent fish returning to the Itchen), October to December (adults returning to spawn) and late March to May (smolts migrating seaward). Percussive piling should be avoided at these times during redevelopment at Town Depot, Ocean Village and Mayflower Park and Royal Pier. Depending on the works to be carried out and their exact location, it may also be possible to avoid impacts by using vibro-piling, or piling only at low tide when any fish present will naturally be further from development sites.

Birds

For birds, the extent of possible impact from Town Depot redevelopment is likely to be low, but nonetheless percussive piling should be avoided where necessary (following detailed project assessment) during the most sensitive time of year i.e. when peak numbers of birds are present (November to February, though some birds will also be present in September, October, March and possibly April). However, suspension of piling works should be considered during severe weather conditions, when birds will need every available opportunity to feed and even small reductions in the extent of usable habitat may be significant.

Avoidance/mitigation of effects from collision mortality risk

Developments which propose tall buildings at the Western Gateway, Ocean Village, or Mayflower Park, Royal Pier and Town Quay should be informed by detailed survey and an assessment of bird strike risk, to ensure their design is appropriate and can avoid negative effects. Design measures could include stepped building heights (lower close to the water), low intensity lighting, reduced ratio of glazing or UV glass/film.

Where detailed assessment raises the possibility of residual risk, the following measures should be explored for incorporation into the development as appropriate (measures used as part of the Centenary Quay development at Weston):

- ▶ Reduce ratio of glass to opaque structure to a realistic minimum.
- ▶ Increase the 'visual noise' of glazed areas. Methods to be considered for enhancing visual noise include:
 - ▶ Non-reflective fretting of glass, as an artistic design or logo;
 - ▶ Interior artwork;
 - ▶ Non-reflective one-way glass through use of external treatment;
 - ▶ Balconies and vegetated facades.
- ▶ Avoid indoor planting where this can be clearly seen from outside without additional measures to obscure the view through the glass.
- ▶ Avoid 'see-through' areas in buildings, especially when aligned with features to which birds might be attracted to fly.
- ▶ Where possible use angled windows (40 degrees optimal).

- ▶ Liaise with those responsible for air/maritime navigation regulations to establish the use of white strobe signals if buildings are tall enough to require them (red strobe lights have been shown to have a particular attractant value to migrant birds at night).
- ▶ Design lighting in accordance with anti sky-lighting pollution protocols.
- ▶ Minimise light scatter to the riverside to the minimum commensurate with public safety.
- ▶ Install systems or manual maintenance protocols to turn off or dim all unnecessary exterior lighting, particularly in the spring and autumn migration seasons.
- ▶ Through tenancy agreements, encourage users or residents of the building to use blinds or curtains at night, especially at times of migration.
- ▶ Bird screens.
- ▶ UV films.
- ▶ One-way films.
- ▶ Exterior sun screens.
- ▶ Interior blinds.

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11 Determining Effects on Site Integrity

11.1 Introduction

11.1.1 Using the information presented in previous chapters, the following sections consider whether there will be adverse effects on the integrity of each European site in turn.

11.1.2 English Nature (2004; now Natural England) has produced guidance on determining site integrity which includes a 'simple, pragmatic checklist' for assessing likely effects on integrity. This requires the assessor to pose a series of questions to consider whether the Appropriate Assessment has shown:

- ▶ That the area of Annex 1 habitats (or composite features) will not be reduced?
- ▶ That there will be no direct effect on the population of the species for which the site was designated or classified?
- ▶ That there will be no indirect effects on the populations of species for which the site was designated due to loss or degradation of their habitat (quantity/quality)?
- ▶ That there will be no changes to the composition of the habitats for which the site was designated (e.g. reduction in species structure, abundance or diversity that comprises the habitat over time)?
- ▶ That there will be no interruption or degradation of the physical, chemical or biological processes that support habitats and species for which the site was designated or classified?

11.1.3 The guidance suggests that if the answer to all of these questions is 'Yes' then it is reasonable to conclude that there is not an adverse effect on integrity. If the answer is 'No' to one or more of the questions then further site-specific factors need to be considered in order to reach a decision. Such factors include:

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

11.1.4 This two-step process is applied to determine whether there will be adverse effects on any of the European sites as a result of the CCAP as it currently stands.

11.2 Chichester and Langstone Harbours SPA/Ramsar

11.2.1 The results of the site integrity tests are shown in **Table 11.1**.

Table 11.1: Site integrity tests for Chichester and Langstone Harbours SPA/Ramsar

Step-one tests	
Has the Appropriate Assessment shown:	Y/N
That the area of annex I habitats (or composite features) will not be reduced?	N/A
That there will be no direct effect on the population of the species for which the site was designated or classified?	Yes
That there will be no indirect effects on the populations of species for which the site was designated or classified due to loss or degradation of their habitat (quantity/quality)?	Yes
That there will be no changes to the composition of the habitats for which the site was designated (eg reduction in species structure, abundance or diversity that comprises the habitat over time)?	Yes
That there will be no interruption or degradation of the physical, chemical or biological processes that support habitats and species for which the site was designated or classified?	Yes

11.2.2 It is concluded that there will be no adverse effect on the integrity of Chichester and Langstone Harbours SPA/Ramsar.

11.3 New Forest SAC/Ramsar

11.3.1 The results of the site integrity tests are shown in **Table 11.2**.

Table 11.2: Site integrity tests for New Forest SAC/Ramsar

Step-one tests	
Has the Appropriate Assessment shown:	Y/N
That the area of annex I habitats (or composite features) will not be reduced?	Yes
That there will be no direct effect on the population of the species for which the site was designated or classified? *	Yes
That there will be no indirect effects on the populations of species for which the site was designated or classified due to loss or degradation of their habitat (quantity/quality)?	Yes
That there will be no changes to the composition of the habitats for which the site was designated (eg reduction in species structure, abundance or diversity that comprises the habitat over time)?	Yes
That there will be no interruption or degradation of the physical, chemical or biological processes that support habitats and species for which the site was designated or classified?	Yes

11.3.2 It is concluded that there will be no adverse effect on the integrity of New Forest SAC/Ramsar.

11.4 New Forest SPA

11.4.1 The results of the site integrity tests are shown in **Table 11.3**.

Table 11.3: Site integrity tests for New Forest SPA

Step-one tests	
Has the Appropriate Assessment shown:	Y/N
That the area of annex I habitats (or composite features) will not be reduced?	N/A
That there will be no direct effect on the population of the species for which the site was designated or classified?	Yes
That there will be no indirect effects on the populations of species for which the site was designated or classified due to loss or degradation of their habitat (quantity/quality)?	Yes
That there will be no changes to the composition of the habitats for which the site was designated (eg reduction in species structure, abundance or diversity that comprises the habitat over time)?	Yes
That there will be no interruption or degradation of the physical, chemical or biological processes that support habitats and species for which the site was designated or classified?	Yes

11.4.2 It is concluded that there will be no adverse effect on the integrity of New Forest SPA.

11.5 Portsmouth Harbour SPA/Ramsar

11.5.1 The results of the site integrity tests are shown in **Table 11.4**.

Table 11.4 Site integrity tests for Portsmouth Harbour SPA/Ramsar

Step-one tests	
Has the Appropriate Assessment shown:	Y/N
That the area of annex I habitats (or composite features) will not be reduced?	N/A
That there will be no direct effect on the population of the species for which the site was designated or classified?	Yes
That there will be no indirect effects on the populations of species for which the site was designated or classified due to loss or degradation of their habitat (quantity/quality)?	Yes
That there will be no changes to the composition of the habitats for which the site was designated (eg reduction in species structure, abundance or diversity that comprises the habitat over time)?	Yes
That there will be no interruption or degradation of the physical, chemical or biological processes that support habitats and species for which the site was designated or classified?	Yes

11.5.2 It is concluded that there will be no adverse effect on the integrity of Portsmouth Harbour SPA/Ramsar.

11.6 River Itchen SAC

11.6.1 The results of the site integrity tests are shown in **Table 11.5**.

Table 11.5: Site integrity tests for River Itchen SAC

Step-one tests	
Has the Appropriate Assessment shown:	Y/N
That the area of annex I habitats (or composite features) will not be reduced?	Yes
That there will be no direct effect on the population of the species for which the site was designated or classified?	Yes
That there will be no indirect effects on the populations of species for which the site was designated or classified due to loss or degradation of their habitat (quantity/quality)?	Yes
That there will be no changes to the composition of the habitats for which the site was designated (eg reduction in species structure, abundance or diversity that comprises the habitat over time)?	Yes
That there will be no interruption or degradation of the physical, chemical or biological processes that support habitats and species for which the site was designated or classified?	Yes

11.6.2 It is concluded that there will be no adverse effect on the integrity of River Itchen SAC.

11.7 Solent Maritime SAC

11.7.1 The results of the site integrity tests are shown in **Table 11.6**.

Table 11.6: Site integrity tests for Solent Maritime SAC

Step-one tests	
Has the Appropriate Assessment shown:	Y/N
That the area of annex I habitats (or composite features) will not be reduced?	Yes
That there will be no direct effect on the population of the species for which the site was designated or classified?	Yes
That there will be no indirect effects on the populations of species for which the site was designated or classified due to loss or degradation of their habitat (quantity/quality)?	Yes
That there will be no changes to the composition of the habitats for which the site was designated (eg reduction in species structure, abundance or diversity that comprises the habitat over time)?	Yes
That there will be no interruption or degradation of the physical, chemical or biological processes that support habitats and species for which the site was designated or classified?	Yes

11.7.2 It is concluded that there will be no adverse effect on the integrity of Solent Maritime SAC.

11.8 Solent and Southampton Water SPA/Ramsar

11.8.1 The results of the site integrity tests are shown in **Table 11.7**.

Table 11.7: Site integrity tests for Solent and Southampton Water SPA/Ramsar

Step-one tests	
Has the Appropriate Assessment shown:	Y/N
That the area of annex I habitats (or composite features) will not be reduced?	N/A
That there will be no direct effect on the population of the species for which the site was designated or classified?	Yes
That there will be no indirect effects on the populations of species for which the site was designated or classified due to loss or degradation of their habitat (quantity/quality)?	Yes
That there will be no changes to the composition of the habitats for which the site was designated (eg reduction in species structure, abundance or diversity that comprises the habitat over time)?	Yes
That there will be no interruption or degradation of the physical, chemical or biological processes that support habitats and species for which the site was designated or classified?	Yes

11.8.2 It is concluded that there will be no adverse effect on the integrity of Solent and Southampton Water SPA/Ramsar.

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12 Conclusions and Consultation Arrangements

12.1 Conclusions

12.1.1 This report presents the Habitats Regulations Assessment of the City Centre Action Plan for Southampton. It presents a screening assessment to determine which aspects of the plan are likely to lead to significant effects, and an Appropriate Assessment to determine whether there will be adverse effects on the integrity of:

- ▶ Chichester and Langstone Harbours SPA / Ramsar;
- ▶ New Forest SAC / SPA / Ramsar;
- ▶ Portsmouth Harbour SPA / Ramsar;
- ▶ River Itchen SAC;
- ▶ Solent Maritime SAC; and
- ▶ Solent and Southampton Water SPA / Ramsar

12.1.2 The report establishes the nature of effects on ecological integrity and assesses the avoidance and mitigation measures put forward within the CCAP, drawing on the information that is currently available. It provides recommendations for additional avoidance and mitigation measures to help ensure that adverse effects on the European sites can be avoided.

12.1.3 Site-specific impacts, such as mobilisation of contaminants, loss of a potential wader roost, collision mortality risk, and noise and vibration effects, are considered avoidable via the measures proposed in preceding chapters. Strategically operating impacts will be managed through a combination of joint-working initiatives and monitoring of their effectiveness. In summary, the CCAP is considered to be Habitats Regulations compliant.

12.1.4 Following the current consultation exercise, the HRA will be revisited to assess any policy changes which are considered necessary in relation to the sites' conservation objectives.

12.2 Consultation Arrangements

12.2.1 This report is open to consultation with the public and stakeholders alongside consultation on the City Centre Action Plan. All responses to the consultation should be sent to:

Email:

city.plan@southampton.gov.uk

Online:

<http://www.southampton.gov.uk/s-environment/policy/developmentframework/>

By post:

**Planning Policy
Planning & Sustainability Division
Civic Centre
Southampton
SO14 7LS**

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Appendix I: Screening Matrix and Mechanisms of Impact

Please see insert.

Table A1: Summary of impact mechanisms and how they are considered to affect each site and qualifying features

Impact cat	Impact sub-cat	AAP drivers	Site	Features	Location	LSE	Policies / comment
AQ	N dep	Traffic flow (resi, emp, retail although city is sustainable location)	New Forest SAC/Ramsar (and SPA)	Lowland heath (and grasslands, woodlands, bogs, mires, plus typical spp.)	M27/A31, A35, A36, A326	Yes	1, 6, 9, 22, 23, 24, 25, 26, 27, 28, 29, 31, 32, 33, 34, 35, 36 and 37
	Acid dep				M27/A31, A36, A326	Yes	
	NOx				n/a	No	
	N dep	As above	Solent Maritime SAC (and Solent/Soton Water SPA/Ramsar)	Saltmarsh, grazing marsh (and mud/sandflats, perennial vegetation & drift lines, dunes (plus typical spp.))	n/a	No	-
	Acid dep				M27, A27, A35/A36, M271, A3024	Yes	1, 6, 9, 22, 23, 24, 25, 26, 27, 28, 29, 31, 32, 33, 34, 35, 36 and 37
	NOx				A27 (marginal: M27, A35/A36, M271, A3024)	Yes	
	N dep	As above	R Itchen SAC	Lowland wood pasture (and <i>Ranunculus</i> , fen, meadow, grasslands, plus typical spp.)	M27/A27, M3 (southern), A34, M3 (northern)	Yes	1, 6, 9, 22, 23, 24, 25, 26, 27, 28, 29, 31, 32, 33, 34, 35, 36 and 37
	Acid dep				M27/A27, M3 (southern), A34, M3 (northern)	Yes	
	NOx				M27/A27	Yes	
FR& CSq	CSq	Vulnerable uses e.g. resi	Solent/Soton Water SPA/Ramsar	Mud/sandflats plus waders, waterfowl, gulls, terns	n/a	No	City centre does not share frontage with EU sites
	Surface water (SW) run-off	Contaminated land	Solent/Soton Water SPA/Ramsar	Mud/sandflats plus waders, waterfowl, gulls, terns	Wherever contaminants mobilised through FRM works – e.g. check site 6 from SFRA2Vol3	Yes?	27, 36
	Surface water (SW) run-off	Contaminated land	R Itchen SAC	Off-site salmon (and bullhead, brook lamprey)		Yes?	27, 36

Eff	Eutrophication (N concentration)	Increasing population (resi)	Solent Maritime SAC and Solent/Soton Water SPA/Ramsar	Saltmarsh, grazing marsh (and mud/sandflats, perennial vegetation & drift lines, dunes (plus typical spp.) AND waders, waterfowl, gulls, terns	Millbrook WWTW	No	Sufficient strategic capacity exists
WD	Abstraction (volumetric flow)	Increasing population (resi)	R Itchen SAC	<i>Ranunculus</i> , fen (plus typical spp.), salmon, bullhead, brook lamprey, otter, damselfly, crayfish	Abstractions at Testwood / Otterbourne / chalk aquifer	Yes?	9, 23, 24, 25, 26, 27, 28, 29, 31, 32, 33, 34, 35, 36, 37
RD	Recreational pressure and disturbance	Increasing population (resi)	New Forest SPA	Woodlark, nightjar, Dartford warbler, hen harrier (and honey buzzard)	See Sharp et al 2008, NF RMS 2010	Yes?	9, 23, 24, 25, 26, 27, 28, 29, 31, 32, 33, 34, 35, 36, 37
	Recreational pressure and disturbance	Increasing population (resi)	Solent/Soton Water, Chich/Lang, Pmth Hbrs SPA/Ramsars	Waders, waterfowl, gulls, terns	See SDMP final outputs	Yes?	9, 23, 24, 25, 26, 27, 28, 29, 31, 32, 33, 34, 35, 36, 37
HLD	Loss of BG foraging site	Devt (any) or increasing population (resi)	Solent/Soton Water SPA/Ramsar	Brent goose (waterfowl)	n/a	No	City centre has no BG sites
	Loss of wader roost		Solent/Soton Water SPA/Ramsar	Waders	Possibly Royal Pier maj dev site (but not ID as future site)	Yes?	24
CRLN V	Collision risk, light	Building location, height, illumination	Solent/Soton Water SPA/Ramsar	Waders, waterfowl, gulls – esp BG	W. Gateway, Waterfront, Mayflower Park, Royal Pier and Town Quay	Yes	17, 24, 36
	Light	Devt site illumination - reduced food availability	Solent/Soton Water SPA/Ramsar	Waders, waterfowl, gulls, terns	n/a	No	City centre does not share frontage with EU sites
	Noise, vibration	Construction – any use inc. FRM;	Solent/Soton Water SPA/Ramsar	Waders, waterfowl, gulls, terns	Up to 300m from >70db source	Yes?	24, 27, 36

	operation – noise emitting uses	R Itchen SAC	Off-site salmon (and bullhead, brook lamprey)	Up to 20m from 128dB source	Yes?	27, 36
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Notes and abbreviations

(Brackets) in column 4 denote coincident sites whose features are less vulnerable to the impact than sites without brackets

Cat – category

LSE – Likely significant effect

AQ – Air quality

N – Nitrogen

Dep – deposition

NOx – Oxides of nitrogen

M3 (northern/southern) – the northerly or southerly APIS grid ref (Annex II)

FR&CSq – Flood risk and coastal squeeze

CSq – Coastal squeeze

FRM – Flood risk management

Sites 2&6 from SFRA2Vol3: 2 – Meridian / Drivers Wharf; 6 – Town Depot

Eff – Effluent discharge

WWTW – Waste water treatment works

WD – Water demand

RD – Recreational disturbance

NF RMS – New Forest Recreation Management Strategy

SDMP – Solent Disturbance and Mitigation Project

HLD – Habitat loss or degradation

BG – Brent goose

CRLNV – Collision risk, light, noise or vibration

Policy Proposal

CROSS CUTTING POLICIES

	SAC				SPA				Ramsar			
	Emer Bog	New Forest	River Itchen	Solent Maritime	Chichester & Langstone Hbrs	New Forest	Portsmouth Harbour	Solent & Southampton Water	Chichester & Langstone Hbrs	New Forest	Portsmouth Harbour	Solent & Southampton Water
1 New office development (supports development of at least 175,000sqm net employment floorspace)	A4	D2:AQ	D2:AQ	D2:AQ	A4	A4	A4	D2:AQ	A4	D2:AQ	A4	D2:AQ
2 Existing offices	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1
3 Safeguarding industrial sites	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1
4 The Port of Southampton	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1
5 Supporting existing retail areas	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1
6 Extension of the Primary Shopping Area (supports development of approx. 100,000sqm gross comparison retail in PSA)	A4	D2:AQ	D2:AQ	D2:AQ	A4	A4	A4	D2:AQ	A4	D2:AQ	A4	D2:AQ
7 Convenience retail	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1
8 The night time economy	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1
9 Housing supply (supports 5,450 dwellings)	A4	D2:AQ	D2:AQ	D2:AQ	A4	A4	A4	D2:AQ	A4	D2:AQ	A4	D2:AQ
9 Housing supply (supports 5,450 dwellings)	A4	A4	A4	A4	D2:RD	D2:RD	D2:RD	D2:RD	D2:RD	A4	D2:RD	D2:RD
10 Supporting primary and secondary educational facilities	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1
11 Supporting higher and further educational facilities	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1
12 Green infrastructure and open spaces	A3	A3	A3	A3	A3	A3	A3	A3	A3	A3	A3	A3
13 Open space in new developments	A3	A3	A3	A3	A3	A3	A3	A3	A3	A3	A3	A3
14 Renewable or low carbon energy plants	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1
15 Flood resilience	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1
16 Design	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1
17 Tall buildings (supports increased heights at sites including waterfront and western gateway)	A4	A4	A4	A4	A4	A4	A4	D2:CRL	A4	A4	A4	D2:CRL
18 Transport and movement (encouraging modal shift)	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1
19 Transport and movement (pedestrian and cyclist priority)	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1

Policy Proposal

SITES

	SAC				SPA				Ramsar			
	Emer Bog	New Forest	River Itchen	Solent Maritime	Chichester & Langstone Hbrs	New Forest	Portsmouth Harbour	Solent & Southampton Water	Chichester & Langstone Hbrs	New Forest	Portsmouth Harbour	Solent & Southampton Water
20 Major Development Quarter (MDQ) - structure, improved links and spaces	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1
21 Major Development Quarter (MDQ) - other issues	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1
22 MDQ - Station Quarter (including substantial element of office development)	A4	D2:AQ	D2:AQ	D2:AQ	A4	A4	A4	D2:AQ	A4	D2:AQ	A4	D2:AQ
23 MDQ - Western Gateway (including substantial element of office development, plus residential)	A4	D2:AQ	D2:AQ	D2:AQ	A4	A4	A4	D2:AQ	A4	D2:AQ	A4	D2:AQ
23 MDQ - Western Gateway (including residential)	A4	A4	A4	A4	D2:RD	D2:RD	D2:RD	D2:RD	D2:RD	A4	D2:RD	D2:RD
24 Mayflower Park and Royal Pier (including employment and residential)	A4	D2:AQ	D2:AQ	D2:AQ	A4	A4	A4	D2:AQ	A4	D2:AQ	A4	D2:AQ
24 Mayflower Park and Royal Pier (including residential)	A4	A4	A4	A4	D2:RD	D2:RD	D2:RD	D2:RD	D2:RD	A4	D2:RD	D2:RD
24 Mayflower Park and Royal Pier (including development at Royal Pier)	A4	A4	A4	A4	A4	A4	A4	D2:HLD	A4	A4	A4	D2:HLD
24 Mayflower Park and Royal Pier (including tall buildings)	A4	A4	A4	A4	A4	A4	A4	D2:CRL	A4	A4	A4	D2:CRL
27 Mayflower Park and Royal Pier (risk of noise and vibration impacts to waders waterfowl, gulls, terns, offsite salmon and other fish)	A4	A4	D2:NV	A4	A4	A4	A4	D2:NV	A4	A4	A4	D2:NV
25 East Street Shopping Centre and Queens Buildings (Debenhams) (including employment, retail and residential)	A4	D2:AQ	D2:AQ	D2:AQ	A4	A4	A4	D2:AQ	A4	D2:AQ	A4	D2:AQ
25 East Street Shopping Centre and Queens Buildings (Debenhams) (including residential)	A4	A4	A4	A4	D2:RD	D2:RD	D2:RD	D2:RD	D2:RD	A4	D2:RD	D2:RD
26 MDQ - North of West Quay Road (including employment, retail and residential)	A4	D2:AQ	D2:AQ	D2:AQ	A4	A4	A4	D2:AQ	A4	D2:AQ	A4	D2:AQ
26 MDQ - North of West Quay Road (including residential)	A4	A4	A4	A4	D2:RD	D2:RD	D2:RD	D2:RD	D2:RD	A4	D2:RD	D2:RD
27 Town Depot (including employment and residential)	A4	D2:AQ	D2:AQ	D2:AQ	A4	A4	A4	D2:AQ	A4	D2:AQ	A4	D2:AQ
27 Town Depot (including residential, public access to waterfront and facilities for water sports activities)	A4	A4	A4	A4	D2:RD	D2:RD	D2:RD	D2:RD	D2:RD	A4	D2:RD	D2:RD
27 Town Depot (including flood risk management measures potentially mobilising contaminants through surface water run-off)	A4	A4	D2:SW	A4	A4	A4	A4	D2:SW	A4	A4	A4	D2:SW
27 Town Depot (risk of noise and vibration impacts to waders waterfowl, gulls, terns, offsite salmon and other fish)	A4	A4	D2:NV	A4	A4	A4	A4	D2:NV	A4	A4	A4	D2:NV
28 Fruit and Vegetable Market (including employment and residential)	A4	D2:AQ	D2:AQ	D2:AQ	A4	A4	A4	D2:AQ	A4	D2:AQ	A4	D2:AQ
28 Fruit and Vegetable Market (including residential)	A4	A4	A4	A4	D2:RD	D2:RD	D2:RD	D2:RD	D2:RD	A4	D2:RD	D2:RD
29 Bargate sites - east of Castle Way, Bargate Shopping Centre and Hanover Buildings (including retail and residential)	A4	D2:AQ	D2:AQ	D2:AQ	A4	A4	A4	D2:AQ	A4	D2:AQ	A4	D2:AQ

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- 29 Bargate sites - east of Castle Way, Bargate Shopping Centre and Hanover Buildings (including residential)
- 30 Albion Place and Castle Way car parks
- 31 144-164 High Street (including employment, retail and residential)
- 31 144-164 High Street (including residential)
- 32 Northern Above Bar (including employment, retail and residential)
- 32 Northern Above Bar (including residential)
- 33 East Park Terrace (including employment and residential)
- 33 East Park Terrace (including residential)
- 34 St Mary's Road (including employment and residential)
- 34 St Mary's Road (including residential)
- 35 Duke Street, Richmond Street and College Street (including employment and residential)
- 35 Duke Street, Richmond Street and College Street (including residential)
- 36 Ocean Village (including employment and residential)
- 36 Ocean Village (including residential, public access to waterfront and water based recreation)
- 37 St Mary Street and Northam Road (including employment, retail and residential)
- 37 St Mary Street and Northam Road (including residential)

	SAC				SPA				Ramsar			
	Emer Bog	New Forest	River Itchen	Solent Maritime	Chichester & Langstone Hbrs	New Forest	Portsmouth Harbour	Solent & Southampton Water	Chichester & Langstone Hbrs	New Forest	Portsmouth Harbour	Solent & Southampton Water
29	A4	A4	A4	A4	D2:RD	D2:RD	D2:RD	D2:RD	D2:RD	A4	D2:RD	D2:RD
30	A3	A3	A3	A3	A3	A3	A3	A3	A3	A3	A3	A3
31	A4	D2:AQ	D2:AQ	D2:AQ	A4	A4	A4	D2:AQ	A4	D2:AQ	A4	D2:AQ
31	A4	A4	A4	A4	D2:RD	D2:RD	D2:RD	D2:RD	D2:RD	A4	D2:RD	D2:RD
32	A4	D2:AQ	D2:AQ	D2:AQ	A4	A4	A4	D2:AQ	A4	D2:AQ	A4	D2:AQ
32	A4	A4	A4	A4	D2:RD	D2:RD	D2:RD	D2:RD	D2:RD	A4	D2:RD	D2:RD
33	A4	D2:AQ	D2:AQ	D2:AQ	A4	A4	A4	D2:AQ	A4	D2:AQ	A4	D2:AQ
33	A4	A4	A4	A4	D2:RD	D2:RD	D2:RD	D2:RD	D2:RD	A4	D2:RD	D2:RD
34	A4	D2:AQ	D2:AQ	D2:AQ	A4	A4	A4	D2:AQ	A4	D2:AQ	A4	D2:AQ
34	A4	A4	A4	A4	D2:RD	D2:RD	D2:RD	D2:RD	D2:RD	A4	D2:RD	D2:RD
35	A4	D2:AQ	D2:AQ	D2:AQ	A4	A4	A4	D2:AQ	A4	D2:AQ	A4	D2:AQ
35	A4	A4	A4	A4	D2:RD	D2:RD	D2:RD	D2:RD	D2:RD	A4	D2:RD	D2:RD
36	A4	D2:AQ	D2:AQ	D2:AQ	A4	A4	A4	D2:AQ	A4	D2:AQ	A4	D2:AQ
36	A4	A4	A4	A4	D2:RD	D2:RD	D2:RD	D2:RD	D2:RD	A4	D2:RD	D2:RD
37	A4	D2:AQ	D2:AQ	D2:AQ	A4	A4	A4	D2:AQ	A4	D2:AQ	A4	D2:AQ
37	A4	A4	A4	A4	D2:RD	D2:RD	D2:RD	D2:RD	D2:RD	A4	D2:RD	D2:RD

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Assessment Key

Category A: No negative effect

- A1 Options / policies that will not themselves lead to development e.g. because they relate to design or other qualitative criteria for development, or they are not a land use planning policy.
- A2 Options / policies intended to protect the natural environment, including biodiversity.
- A3 Options / policies intended to conserve or enhance the natural, built or historic environment, where enhancement measures will not be likely to have any negative effect on a European Site.
- A4 Options / policies that positively steer development away from European sites and associated sensitive areas.
- A5 Options / policies that would have no effect because development is implemented through later policies in the same plan, which are more specific and therefore more appropriate to assess for their effects on European Sites.

Category B: No significant effect

- B Options / policies that could have an effect, but the likelihood is there would be no significant negative effect on a European site either alone or in combination with other elements of the same plan, or other plans or projects.

Category C: Likely significant effect alone

- C1 The option, policy or proposal could directly affect a European site because it provides for, or steers, a quantity or type of development onto a European site, or adjacent to it.
- C2 The option / policy could indirectly affect a European site e.g. because it provides for, or steers, a quantity or type of development that may be ecologically, hydrologically or physically connected to it or increase disturbance.
- C3 Proposals for a magnitude of development that, no matter where it was located, the development would be likely to have a significant effect on a European site.
- C4 An option / policy that makes provision for a quantity / type of development but the effects are uncertain because its detailed location is to be selected following consideration of options in a later, more specific plan.
- C5 Options / policies for developments or infrastructure projects that could block alternatives for the provision of other development in the future, that may lead to adverse effects on European sites, which would otherwise be avoided.
- C6 Options, policies or proposals which are to be implemented in due course - if implemented in one or more particular ways, the proposal could possibly have a significant effect on a European site.
- C7 Any other options, policies or proposals that would be vulnerable to failure under the Habitats Regulations at project assessment stage; to include them in the plan would be regarded by the EC as 'faulty planning'.
- C8 Any other proposal that may have an adverse effect on a European site, which might try to pass the tests of HRA at project level by arguing that the plan provides IROPI to justify its consent despite a negative assessment.

Category D: Likely significant effects in combination

- D1 The option, policy or proposal alone would not be likely to have significant effects but if its effects are combined with the effects of other policies within the same plan the cumulative effects would be likely to be significant.
- D2 Options, policies or proposals that alone would not be likely to have significant effects but if their effects are combined with the effects of other plans or projects, the combined effects would be likely to be significant.
- D3 Options or proposals that are, or could be, part of a programme or sequence of development delivered over a period, where the implementation of the later stages could have a significant effect on European sites.
- ? Uncertain effects because the issue/option currently lacks detail. The screening assessment will be re-visited as more detail becomes available.

SAC				SPA				Ramsar			
Emer Bog	New Forest	River Itchen	Solent Maritime	Chichester & Langstone Hbrs	New Forest	Portsmouth Harbour	Solent & Southampton Water	Chichester & Langstone Hbrs	New Forest	Portsmouth Harbour	Solent & Southampton Water



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