HRA of the Revised Portsmouth Seafront Masterplan

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1. Introduction

1.1 Portsmouth City Council subjected its Seafront Masterplan to HRA in 2012 and formally adopted it in 2013. The document highlighted the seafront's key role as a tourism destination and in creating the unique atmosphere of Portsmouth as a city. It also recognised the unique ecological assemblages, consisting mainly of migratory and overwintering waterfowl, in nearby designated European sites. Some of the development opportunities in the Masterplan were delivered, which has resulted in an increase of visitor numbers to the wider area.

1.2 The Seafront Masterplan is now being revisited to set out the place making and development aspirations the Council has for the area, including the identification of deliverable projects. Public consultation was carried out in 2018 and early 2019 with further consultation on draft proposals planned.

1.3 AECOM has been commissioned to assess these development proposals and their potential implications, if any, for nearby European protected sites. The purpose of this HRA is to identify the relevant European sites, determine whether the proposals are likely to result in LSEs and / or adverse effect on the integrity of these sites and, if applicable, to propose mitigation measures.

Legislative Context

1.4 The need for an assessment of impacts on European sites is set out within Article 6 of the Habitats Directive, and transposed into UK law by the Conservation of Habitats and Species Regulations 2017 (Figure 1). The ultimate aim of the Habitats Directive is to "*maintain or restore, at favourable conservation status, natural habitats and species of wild fauna and flora of Community interest*" (Article 2(2)). This aim relates to habitats and species, not the European Sites themselves, although the European Sites have a significant role in delivering favourable conservation status.

1.5 The Habitats Directive applies the precautionary principle[1] to European Sites. Consent should only be granted for plans and projects once the relevant competent authority has ascertained that there will either be no likelihood of significant effects, or no adverse effect on the integrity of the European Site(s) in question. Where an Appropriate Assessment has been carried out and results in a negative impact, or if uncertainty remains over the significant effect, consent will only be granted if there are no alternative solutions and there are Imperative Reasons of Over-riding Public Interest (IROPI) for the development and compensatory measures have been secured.

1.6 To ascertain whether or not site integrity will be affected, an Appropriate Assessment should be undertaken of the plan or project in question. The competent authority is entitled to request the applicant (where applicable) to produce such information as the competent authority may reasonably require for the purposes of the assessment, or to enable it to determine whether an appropriate assessment is required. Figure 1 provides the legislative basis for an Appropriate Assessment.

[1] The Precautionary Principle, which is referenced in Article 191 of the Treaty on the Functioning of the European Union, has been defined by the United Nations Educational, Scientific and Cultural Organisation (UNESCO, 2005) as:
"*When human activities may lead to morally unacceptable harm [to the environment] that is scientifically plausible but uncertain, actions shall be taken to avoid or diminish that harm. The judgement of plausibility should be grounded in scientific analysis*".

Habitats Directive 1992

Article 6 (3) states that:

"*Any plan or project not directly connected with or necessary to the management of the site but likely to have a significant effect thereon, either individually or in combination with other plans or projects, shall be subject to appropriate assessment of its implications for the site in view of the site's conservation objectives."*

Conservation of Habitats and Species Regulations 2017 (as amended)

The Regulations state that:

"*A competent authority, before deciding to … give any consent for a plan or project which is likely to have a significant effect on a European site … must make an appropriate assessment of the implications for the plan or project in view of that site's conservation objectives… The competent authority may agree to the plan or project only after having ascertained that it will not adversely affect the integrity of the European site."*

Figure 1. The legislative basis for Appropriate Assessment

1.7 Over the years, 'Habitats Regulations Assessment' (HRA) has come into wide currency to describe the overall process set out in the Habitats Regulations, from screening through to identification of IROPI. This has arisen in order to distinguish the overall process from the individual stage of "Appropriate Assessment". Throughout this Report the term HRA is used for the overall process and restricts the use of Appropriate Assessment to the specific stage of that name.

Quality Assurance

1.8 This report was undertaken in line with AECOM's Integrated Management System (IMS). Our IMS places great emphasis on professionalism, technical excellence, quality, environmental and Health and Safety management. All staff members are committed to establishing and maintaining our certification to the international standards BS EN ISO 9001:2008 and 14001:2004 and BS OHSAS 18001:2007. In addition, our IMS requires careful selection and monitoring of the performance of all sub-consultants and contractors.

1.9 All AECOM Ecologists working on this project are members (at the appropriate level) of the Chartered Institute of Ecology and Environmental Management (CIEEM) and follow their code of professional conduct (CIEEM, 2017).

2. Methodology

Introduction

2.1 The HRA has been carried out with reference to the general EC guidance on HRA[2]; Natural England has produced its own internal guidance[3]. These have been referred to in undertaking this HRA.

2.2 Figure 2 below outlines the stages of HRA according to current EC guidance. The stages are essentially iterative, being revisited as necessary in response to more detailed information, recommendations and any relevant changes to the plan until no significant adverse effects remain.

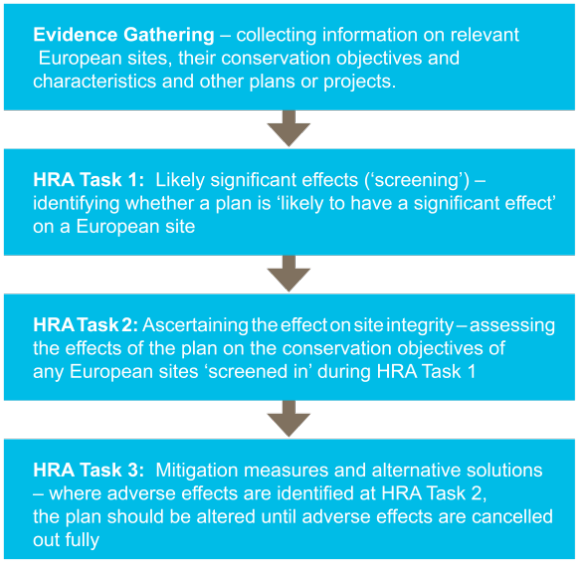


Figure 2. Four Stage Approach to Habitats Regulations Assessment. Source EC, 2001[1].

Description of HRA Tasks

HRA Task 1 – Likely Significant Effects (LSE)

2.3 Following evidence gathering, the first stage of any Habitats Regulations Assessment is a Likely Significant Effect (LSE) test - essentially a risk assessment to decide whether the full subsequent stage known as Appropriate Assessment is required. The essential question is:

"Is the project, either alone or in combination with other relevant projects and plans, likely to result in a significant effect upon European sites?"

2.4 The objective is to 'screen out' those plans and projects that can, without any detailed appraisal, be said to be unlikely to result in significant adverse effects upon European sites, usually because there is no mechanism for an adverse interaction with European sites. This stage is undertaken in section 5 of this report.

HRA Task 2 – Appropriate Assessment (AA)

2.5 Where it is determined that a conclusion of 'no likely significant effect' cannot be drawn, the analysis has proceeded to the next stage of HRA known as Appropriate Assessment. Case law has clarified that 'appropriate assessment' is not a technical term. In other words, there are no particular technical analyses, or level of technical analysis, that are classified by law as belonging to appropriate assessment rather than determination of likely significant effects.

[2] European Commission (2001): Assessment of plans and projects significantly affecting Natura 2000 Sites: Methodological Guidance on the Provisions of Article 6(3) and 6(4) of the Habitats Directive.
[3] http://www.ukmpas.org/pdf/practical_guidance/HRGN1.pdf

2.6 By virtue of the fact that it follows Screening, there is a clear implication that the analysis will be more detailed than undertaken at the Screening stage and one of the key considerations during appropriate assessment is whether there is available mitigation that would entirely address the potential effect. In practice, the appropriate assessment would take any policies or allocations that could not be dismissed following the high-level Screening analysis and analyse the potential for an effect in more detail, with a view to concluding whether there would actually be an adverse effect on integrity (in other words, disruption of the coherent structure and function of the European site(s)).

2.7 A decision by the European Court of Justice[4] concluded that measures intended to avoid or reduce the harmful effects of a proposed project on a European site may no longer be taken into account by competent authorities at the Likely Significant Effects or 'screening' stage of HRA. That ruling has been considered in producing this HRA.

2.8 Also in 2018 the Holohan ruling[5] was handed down by the European Court of Justice. Among other provisions paragraph 39 of the ruling states that '*As regards other habitat types or species, which are present on the site, but for which that site has not been listed, and with respect to habitat types and species located outside that site, … typical habitats or species must be included in the appropriate assessment, if they are necessary to the conservation of the habitat types and species listed for the protected area*' [emphasis added]. This has been taken into account in the HRA process.

HRA Task 3 – Avoidance and Mitigation

2.9 Where necessary, measures are recommended for incorporation into the document in order to avoid or mitigate adverse effects on European sites. There is considerable precedent concerning the level of detail that a proposal needs to contain regarding mitigation for recreational impacts on European sites. The implication of this precedent is that it is not necessary for all measures that will be deployed to be fully developed prior to adoption of the planning document, but the Plan must provide an adequate policy framework within which these measures can be delivered.

2.10 In evaluating significance, AECOM has relied on professional judgement as well as the results of previous stakeholder consultation regarding development impacts on the European sites considered within this assessment.

Physical Scope of the HRA

2.11 There are no standard criteria for determining the ultimate physical scope of an HRA. Rather, the source-pathway-receptor model should be used to determine whether there is any potential pathway connecting development to any European sites. In the case of the Portsmouth Seafront Masterplan it was determined that for an initial coarse screen, several European Sites should be considered:

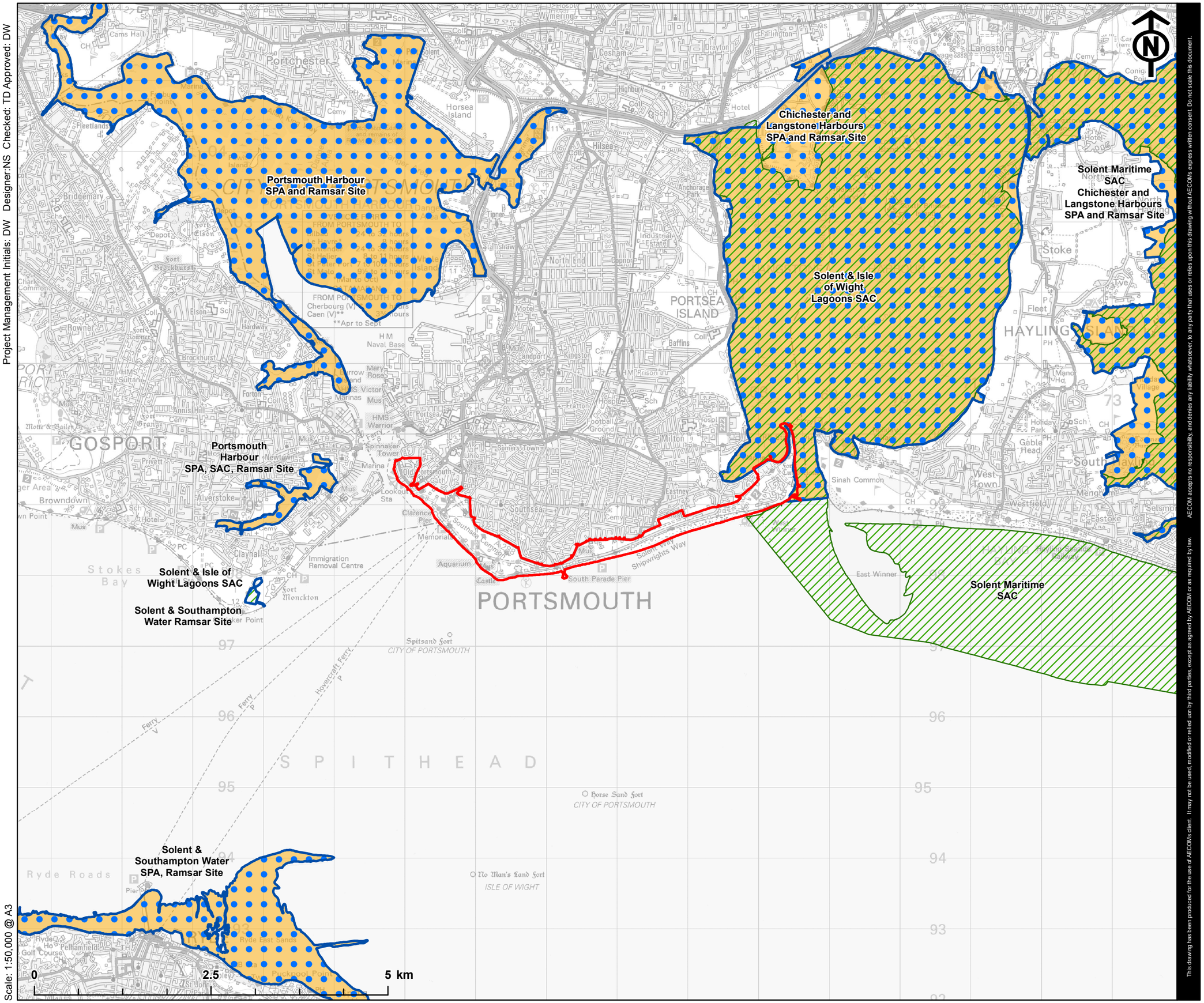
- Portsmouth Harbour SPA / Ramsar
- Chichester and Langstone Harbours SPA / Ramsar
- Solent and Southampton Water SPA / Ramsar
- Solent Maritime SAC
- Solent and Isle of Wight Lagoons SAC

2.12 This was based upon a 15km search zone around the proposed development area. For the initial screening exercise these European Sites were considered in relation to the Masterplan. It should be noted that the presence of a conceivable pathway linking the development areas to a European site does not mean that likely significant effects will occur.

[4] People Over Wind and Sweetman v Coillte Teoranta (C-323/17)
[5] Case C-461/17

Figure 3: Map of the European sites identified relevant in relation to the Portsmouth Seafront Masterplan SPD boundary.

Project Management Initials: DW Designer:NS Checked: TD Approved: DW



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AECOM

PROJECT

HRA of the emerging Portsmouth Seafront Masterplan

CLIENT

Portsmouth City Council

KEY:

- Portsmouth Seafront Masterplan Boundary
- Ramsar
- Special Area of Conservation
- Special Protection Area

PROJECT NUMBER

60586784

SHEET TITLE

Portsmouth Seafront Masterplan boundary in relation to European sites

SHEET NUMBER

Figure: 1

3. European Sites

3.1 The following European sites are situated within 15km of the development area outlined in the Portsmouth Seafront Masterplan:

- Portsmouth Harbour SPA / Ramsar
- Chichester and Langstone Harbours SPA / Ramsar
- Solent and Southampton Water SPA / Ramsar
- Solent Maritime SAC
- Solent and Isle of Wight Lagoons SAC

3.2 Due to development being within the 10km screening distance, there are potential negative impacts on these sites of conservation interest. They are thus needed to be considered in more detail. The following section provides an introduction, the qualifying features, the conservation objectives and the threats / pressures to each of these European sites.

Portsmouth Harbour SPA / Ramsar

Introduction

3.3 This European site is an industrialised estuary located centrally on the south coast of England. It comprises one of the four largest expanses of mud-flats and tidal creeks in southern England. These mud-flats support a diverse assemblage of aquatic plants, including narrow-leaved eelgrass *Zostera angustifolia*, dwarf eelgrass *Zostera noltii* and sea lettuce *Ulva lactuca*. Portsmouth Harbour is connected to the sea via a narrow section of the Solent and only receives small quantities of freshwater (e.g. from the River Wallington), therefore possessing a unique hydrology. The site supports significant numbers of wintering dark-bellied brent geese *Branta b. bernicla*, which are known to feed extensively in surrounding agricultural areas outside the SPA boundary.

SPA Qualifying Features[6]

3.4 This site qualifies under **Article 4.2** of the Directive (79/409/EEC) by supporting populations of European importance of the following migratory species:

Over winter:

- Dark-bellied brent goose *Branta bernicla bernicla*: 2,847 individuals representing at least 0.9% of the wintering Western Siberia / Western Europe population (5 year peak mean 1991/2 – 1995/6)
- Red-breasted merganser *Mergus serrator*: 87 individuals (non-breeding)
- Dunlin *Calidris alpina alpina*: 5,123 individuals (non-breeding)
- Black-tailed godwit *Limosa limosa islandica*: 31 individuals (non-breeding)

Ramsar Qualifying Features[7]

3.5 Portsmouth Harbour qualifies as a Ramsar site under the following criteria:

Criterion 3

The intertidal mudflat areas possess extensive beds of eelgrass *Zostera angustifolia* and *Zostera noltei* which support the grazing dark-bellied brent geese populations. The mud-snail *Hydrobia ulvae* is found at

[6] http://jncc.defra.gov.uk/default.aspx?page=2036 [Accessed 30/05/2019]
[7] http://jncc.defra.gov.uk/default.aspx?page=2036 [Accessed 30/05/2019]

extremely high densities, which helps to support the wading bird interest of the site. Common cord-grass *Spartina anglica* dominates large areas of the saltmarsh and there are also extensive areas of green algae *Enteromorpha* spp. and sea lettuce *Ulva lactuca*. More locally the saltmarsh is dominated by sea purslane *Halimione portulacoides* which gradates to more varied communities at the higher shore levels. The site also includes a number of saline lagoons hosting nationally important species.

Criterion 6 Species / populations occurring at levels of international importance

Qualifying species / populations (as identified at designation):

Species with peak counts in winter

- Dark-bellied brent goose *Branta bernicla bernicla*; 2,105 individuals, representing an average of 2.1% of the GB population (5 year peak mean 1998/9 – 2002/3)

SPA Conservation Objectives[8]

With regard to the SPA and the individual species and/or assemblage of species for which the site has been classified (the 'Qualifying Features' listed below), and subject to natural change;

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

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

Threats / Pressures to Site Integrity[9]

3.6 The following threats and pressures to the integrity of the Portsmouth Harbour SPA have been identified in the Natural England Site Improvement Plan:

- Public access / disturbance
- Costal squeeze
- Fisheries: Commercial marine and estuarine
- Water pollution
- Changes in species distribution
- Climate change
- Change to site conditions
- Invasive species
- Direct land take from development
- Biological resource use
- Change in land management
- Inappropriate pest control
- Air pollution: Impact of atmospheric nitrogen deposition

[8] http://publications.naturalengland.org.uk/publication/4857883850178560 [Accessed 30/05/2019]
[9] http://publications.naturalengland.org.uk/publication/4692013588938752 [Accessed 30/05/2019]

- Hydrological changes
- Extraction: Non-living resources

Chichester and Langstone Harbours SPA / Ramsar

Introduction

3.7 The Chichester and Langstone Harbours SPA / Ramsar is a complex of large, sheltered estuarine basins comprising sand- and mud-flats that are exposed at low tide. The two harbours are connected via a stretch of water that separates Hayling Island from the mainland. Some tidal channels drain the basin and reach far inland. The mud-flats harbour a rich assemblage of invertebrates and algae, such as *Enteromorpha* spp. and eelgrasses *Zostera* spp. The wide range of habitats present in the Chichester and Langstone Harbours SPA / Ramsar support key animal communities. These include significant numbers of waterbirds during migration and over winter. Furthermore, the site supports important colonies of breeding terns, which are rare in southern England.

SPA Qualifying Features[10]

3.8 This site qualifies under **Article 4.1** of the Directive (79/409/EEC) by supporting populations of European importance of the following species listed on Annex I of the Directive:

During the breeding season:

- Little tern *Sterna albifrons*; 100 pairs representing up to 4.2% of the breeding population in Great Britain (5 year mean, 1992 – 1996)
- Sandwich tern *Sterna sandvicensis*; 158 pairs representing up to 1.1% of the breeding population in Great Britain (1998)
- Common tern *Sterna hirundo*; 126 pairs (5 year mean, 2011-2015)

On passage:

- Little egret *Egretta garzetta*; 137 individuals representing up to 17.1% of the population in Great Britain (Count as at 1998)

Over winter:

- Bar-tailed godwit *Limosa lapponica*; 1,692 individuals representing up to 3.2% of the wintering population in Great Britain (5 year peak mean 1991/2 – 1995/6)
- Little egret *Egretta garzetta*; 100 individuals representing up to 20% of the wintering population in Great Britain (Count as at 1998)

3.9 This site qualifies under **Article 4.2** of the Directive (79/409/EEC) by supporting populations of European importance of the following migratory species:

On passage:

- Ringed Plover *Charadrius hiaticula*; 2,471 individuals representing up to 4.9% of the Europe/Northern Africa - wintering population (5 year peak mean 1991/2 - 1995/6

Over winter:

- Black-tailed Godwit *Limosa limosa islandica*; 1,003 individuals representing up to 1.4% of the wintering Iceland - breeding population (5 year peak mean 1991/2 - 1995/6)
- Dark-bellied brent Goose *Branta bernicla bernicla*; 17,119 individuals representing up to 5.7% of the wintering Western Siberia/Western Europe population (5 year peak mean 1991/2 - 1995/6)
- Dunlin *Calidris alpina alpina*; 44,294 individuals representing up to 3.2% of the wintering Northern Siberia/Europe/Western Africa population (5 year peak mean 1991/2 - 1995/6)

[10] http://jncc.defra.gov.uk/default.aspx?page=2034 [Accessed 30/05/2019]

- Grey Plover *Pluvialis squatarola*, 3,825 individuals representing up to 2.5% of the wintering Eastern Atlantic - wintering population (5 year peak mean 1991/2 - 1995/6)
- Redshank *Tringa totanus*; 1,788 individuals representing up to 1.2% of the wintering Eastern Atlantic - wintering population (5 year peak mean 1991/2 - 1995/6)
- Ringed Plover *Charadrius hiaticula*, 846 individuals representing up to 1.7% of the wintering Europe/Northern Africa - wintering population (5 year peak mean 1991/2 - 1995/6)
- Common shelduck *Tadorna tadorna*; 1,096 individuals wintering population (5 year peak mean 2009/10 – 2013/14)
- Eurasian wigeon *Anas Penelope*; 3,947 individuals wintering population (5 year peak mean 2009/10 – 2013/14)
- Eurasian teal *Anas crecca*; 1,953 individuals wintering population (5 year peak mean 2009/10 – 2013/14)
- Northern pintail *Anas acuta*; 338 individuals wintering population (5 year peak mean 2009/10 – 2013/14)
- Northern shoveler *Anas clypeata*; 106 individuals wintering populations (5 year peak mean 2009/10 – 2013/14)
- Red-breasted merganser *Mergus serrator*; 366 individuals wintering population (5 year peak mean 2009/10 – 2013/14)
- Sanderling *Calidris alba*; 216 individuals wintering population (5 year peak mean 2009/10 – 2013/14)
- Eurasian curlew *Numenius arquata*; 3,181 individuals wintering population (5 year peak mean 2009/10 – 2013/14)
- Ruddy turnstone *Arenaria interpres*; 501 individuals wintering population (5 year peak mean 2009/10 – 2013/14)

3.10 Assemblage qualification: A wetland of international importance.

The area qualifies under **Article 4.2** of the Directive (79/409/EEC) by regularly supporting at least 20,000 waterfowl

Over winter, the area regularly supports 93,142 individual waterfowl (5 year peak mean 1991/2 - 1995/6) including: Wigeon *Anas penelope*, Bar-tailed Godwit *Limosa lapponica*, Dark-bellied brent Goose *Branta bernicla bernicla*, Ringed Plover *Charadrius hiaticula*, Grey Plover *Pluvialis squatarola*, Dunlin *Calidris alpina alpina*, Black-tailed Godwit *Limosa limosa islandica*, Redshank *Tringa totanus*, Little Grebe *Tachybaptus ruficollis*, Little Egret *Egretta garzetta*, Shelduck *Tadorna tadorna*, Curlew *Numenius arquata*, Teal *Anas crecca*, Pintail *Anas acuta*, Shoveler *Anas clypeata*, Red-breasted Merganser *Mergus serrator*, Oystercatcher *Haematopus ostralegus*, Lapwing *Vanellus vanellus*, Knot *Calidris canutus*, Sanderling *Calidris alba*, Cormorant *Phalacrocorax carbo*, Whimbrel *Numenius phaeopus*.

Ramsar Qualifying Features[11]

3.11 The Chichester and Langstone Harbours qualify as a Ramsar site under the following criteria:

Criterion 1

Two large estuarine basins linked by the channel which divides Hayling Island from the main Hampshire coastline. The site includes intertidal mudflats, saltmarsh, sand and shingle spits and sand dunes.

Criterion 5

Assemblages of international importance

Species with peak counts in winter

76,480 waterfowl (5 year peak mean 1998/99 – 2002/03)

[11] http://jncc.defra.gov.uk/pdf/RIS/UK11013.pdf [Accessed 30/05/2019]

Criterion 6 Species / populations occurring at levels of international importance

Qualifying species / populations (as identified at designation):

Species with peak counts in spring / autumn

- Ringed plover *Charadrius hiaticula*, Europe / Northwest Africa: 853 individuals, representing an average of 1.1% of the population (5 year peak mean 1998/9 – 2002/3)
- Black-tailed godwit *Limosa limosa islandica*, Iceland / W Europe: 906 individuals, representing an average of 2.5% of the population (5 year peak mean 1998/9 – 2002/3)
- Common redshank *Tringa totanus totanus*: 2,577 individuals, representing an average of 1% of the population (5 year peak mean 1998/9 – 2002/3)

Species with peak counts in winter

- Dark-bellied brent goose *Branta bernicla bernicla*: 12,987 individuals, representing an average of 6% of the population (5 year peak mean 1998/9 – 2002/3)
- Common shelduck *Tadorna tadorna*, NW Europe: 1,468 individuals, representing an average of 1.8% of the GB population (5 year peak mean 1998/9 – 2002/3)
- Grey plover *Pluvialis squatarola*, E Atlantic / W Africa – wintering: 3,043 individuals, representing an average of 1.2% of the population (5 year peak mean 1998/9 – 2002/3)
- Dunlin *Calidris alpine alpine*, W Siberia / W Europe: 33,436 individuals, representing an average of 2.5% of the population (5 year peak mean 1998/9 – 2002/3)

Species / populations identified subsequent to designation for possible future consideration under criterion 6.

Species regularly supported during the breeding season

- Little tern *Sterna albifrons albifrons*, W Europe: 130 apparently occupied nests, representing an average of 1.1% of the breeding population

SPA Conservation Objectives[12]

3.12 With regard to the SPA and the individual species and/or assemblage of species for which the site has been classified (the 'Qualifying Features' listed below), and subject to natural change;

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

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

Threats / Pressures to Site Integrity[13]

3.14 The following threats and pressures to the integrity of the Portsmouth Harbour SPA have been identified in the Natural England Site Improvement Plan:

- Public access / disturbance
- Costal squeeze
- Fisheries: Commercial marine and estuarine

[12] http://publications.naturalengland.org.uk/publication/5789102905491456 [Accessed 30/05/2019]
[13] http://publications.naturalengland.org.uk/publication/4692013588938752 [Accessed 30/05/2019]

- Water pollution
- Changes in species distribution
- Climate change
- Change to site conditions
- Invasive species
- Direct land take from development
- Biological resource use
- Change in land management
- Inappropriate pest control
- Air pollution: Impact of atmospheric nitrogen deposition
- Hydrological changes
- Extraction: Non-living resources

Solent Maritime SAC

Introduction

3.15 The Solent comprises a major estuarine system on the south coast of England with four coastal plain estuaries and four bar-built estuaries. The maritime SAC is the only site that contains a cluster of physiographic sub-types of estuary. Furthermore, in contrast to all other European estuaries, the Solent has a unique hydrographic regime consisting of four tides per day.

3.16 The site also harbours a complex array of marine and estuarine habitats. Sediment habitats in the estuarine system include extensive estuarine flats with intertidal areas, supporting eelgrass *Zostera* spp., green algae, sand and shingle spits, and shoreline transitions. Mudflat habitats range from low or variable salinity in the upper reaches of the estuaries to fully marine mudflats in Chichester and Langstone Harbours. Unusual species in these habitats include rare sponges, communities of a polychaete *Sabellaria spinulosa* and smooth cord-grass *Spartina alterniflora*.

3.17 Within the Solent Maritime SAC, the second-largest aggregation of Atlantic salt meadows in south / south-west England is located. The saltmarsh is present as a large number of disjointed habitat patches. This ungrazed aquatic plant community is dominated by sea-purslane *Atriplex portulacoides*, common sea-lavender *Limonium vulgare* and thrift *Armeria maritima*. Overall, the site is less disturbed by man-made structures than other parts of the southern coast.

Qualifying Features[14]

3.18 Annex I habitats that are a primary reason for selection of this site:

- Estuaries
- Spartina swards (*Spartinion maritimae*)
- Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*)

3.19 Annex I habitats present as a qualifying feature, but not a primary reason for selection of this site:

- Sandbanks which are slightly covered by sea water all the time
- Mudflats and sandflats not covered by sea water at low tide

[14] http://jncc.defra.gov.uk/protectedsites/sacselection/sac.asp?EUCode=UK0030059 [Accessed 30/05/2019]

- Coastal lagoons
- Annual vegetation of drift lines
- Perennial vegetation of stony banks
- *Salicornia* and other annuals colonizing mud and sand
- Shifting dunes along the shoreline with *Ammophila arenaria* ('white dunes')

3.20 Annex II species present as a qualifying feature, but not a primary reason for site selection

- Desmoulin's whorl snail *Vertigo moulinsiana*

Conservation Objectives[15]

3.21 With regard to the SAC and the natural habitats and/or species for which the site has been designated (the 'Qualifying Features' listed below), and subject to natural change;

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

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

Threats / Pressures to Site Integrity[16]

3.23 The following threats and pressures to the integrity of the Portsmouth Harbour SPA have been identified in the Natural England Site Improvement Plan:

- Public access / disturbance
- Costal squeeze
- Fisheries: Commercial marine and estuarine
- Water pollution
- Changes in species distribution
- Climate change
- Change to site conditions
- Invasive species
- Direct land take from development
- Biological resource use
- Change in land management
- Inappropriate pest control
- Air pollution: Impact of atmospheric nitrogen deposition

[15] http://publications.naturalengland.org.uk/publication/4857883850178560 [Accessed 30/05/2019]
[16] http://publications.naturalengland.org.uk/publication/4692013588938752 [Accessed 30/05/2019]

- Hydrological changes
- Extraction: Non-living resources

Solent and Southampton Water SPA / Ramsar

Introduction

3.24 The Solent and Southampton Water SPA / Ramsar covers an expansive area on the south England coast from Hurst Spit to Hill Head on the coast of Hampshire, and from Yarmouth to Whitecliff Bay along the north coast of the Isle of Wight. It is composed of several estuaries and harbours with mudflats, saltmarshes, saline lagoons, shingle beaches, reedbeds, damp woodland and grazing marsh.

3.25 The mudflats support beds of *Enteromorpha* spp. and *Zostera* spp., and harbour a rich assemblage of invertebrates that forms the main food source for estuarine birds. In the breeding season in summer, the site is important for seabirds such as gulls and terns. In winter the SPA holds a significant assemblage of waterfowl, including geese, ducks and waders. The brent goose *Branta bernicla bernicla* is known to feed in areas of surrounding agricultural land.

SPA Qualifying Features[17]

3.26 This site qualifies under **Article 4.1** of the Directive (79/409/EEC) by supporting populations of European importance of the following species listed on Annex I of the Directive:

During the breeding season;

- Common tern *Sterna hirundo*, 267 pairs representing at least 2.2% of the breeding population in Great Britain (5 year peak mean, 1993-1997)
- Little tern *Sterna albifrons*, 49 pairs representing at least 2% of the breeding population in Great Britain (5 year peak mean, 1993-1997)
- Mediterranean gull *Larus melanocephalus*, 2 pairs representing at least 20% of the breeding population in Great Britain (5 year peak mean, 1994-1998)
- Roseate tern *Sterna dougallii*, 2 pairs representing at least 3.3% of the breeding population in Great Britain (5 year peak mean, 1993-1997)
- Sandwich tern *Sterna sandvicensis*, 231 pairs representing at least 1.7% of the breeding population in Great Britain (5 year peak mean, 1993-1997)

3.27 This site also qualifies under **Article 4.2** of the Directive (79/409/EEC) by supporting populations of European importance of the following migratory species:

Over winter;

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

3.28 Assemblage qualification: A wetland of international importance.

The area qualifies under **Article 4.2** of the Directive (79/409/EEC) by regularly supporting at least 20,000 waterfowl

[17] http://jncc.defra.gov.uk/default.aspx?page=2037 [Accessed 30/05/2019]

Over winter, the area regularly supports 53,948 individual waterfowl (5 year peak mean 1991/2 - 1995/6) including: Gadwall *Anas strepera*, Teal *Anas crecca*, Ringed Plover *Charadrius hiaticula*, Black-tailed Godwit *Limosa limosa islandica*, Little Grebe *Tachybaptus ruficollis*, Great Crested Grebe *Podiceps cristatus*, Cormorant *Phalacrocorax carbo*, Dark-bellied brent Goose *Branta bernicla bernicla*, Wigeon *Anas penelope*, Redshank *Tringa totanus*, Pintail *Anas acuta*, Shoveler *Anas clypeata*, Red-breasted Merganser *Mergus serrator*, Grey Plover *Pluvialis squatarola*, Lapwing *Vanellus vanellus*, Dunlin *Calidris alpina alpina*, Curlew *Numenius arquata*, Shelduck *Tadorna tadorna*.

Ramsar Qualifying Features[18]

3.29 The Solent and Southampton Water qualify as a Ramsar site under the following criteria:

Criterion 1

The site is one of the few major sheltered channels between a substantial island and mainland in European waters, exhibiting an unusual strong double tidal flow and has long periods of slack water at high and low tide. It includes many wetland habitats characteristic of the biogeographic region: saline lagoons, saltmarshes, estuaries, intertidal flats, shallow coastal waters, grazing marshes, reedbeds, coastal woodland and rocky boulder reefs.

Criterion 2

The site supports an important assemblage of rare plants and invertebrates. At least 33 British Red Data Book invertebrates and at least eight British Red Data Book plants are represented on site.

Criterion 5

Assemblages of international importance

Species with peak counts in winter

51,343 waterfowl (5 year peak mean 1998/99 – 2002/03)

Criterion 6 Species / populations occurring at levels of international importance

Qualifying species / populations (as identified at designation):

Species with peak counts in spring / autumn

- Ringed plover *Charadrius hiaticula*, Europe / Northwest Africa: 853 individuals, representing an average of 1.1% of the population (5 year peak mean 1998/9 – 2002/3)

Species with peak counts in winter

- Dark-bellied brent goose *Branta bernicla bernicla*: 12,987 individuals, representing an average of 6% of the population (5 year peak mean 1998/9 – 2002/3)
- Eurasian teal *Anas crecca*, NW Europe: 5,514 individuals, representing an average of 1.3% of the population (5 year peak mean 1998/9 – 2002/3)
- Black-tailed godwit *Limosa limosa islandica*, Iceland / W Europe: 1,240 individuals, representing an average of 3.5% of the population (5 year peak mean 1998/9 – 2002/3)

Conservation Objectives[19]

3.30 With regard to the SPA and the individual species and/or assemblage of species for which the site has been classified (the 'Qualifying Features' listed below), and subject to natural change;

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

- The extent and distribution of the habitats of the qualifying features

[18] http://jncc.defra.gov.uk/pdf/RIS/UK11063.pdf [Accessed 30/05/2019]
[19] http://publications.naturalengland.org.uk/publication/6567218288525312 [Accessed 30/05/2019]

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

Threats / Pressure to Site Integrity[20]

3.32 The following threats and pressures to the integrity of the Portsmouth Harbour SPA have been identified in the Natural England Site Improvement Plan:

- Public access / disturbance
- Costal squeeze
- Fisheries: Commercial marine and estuarine
- Water pollution
- Changes in species distribution
- Climate change
- Change to site conditions
- Invasive species
- Direct land take from development
- Biological resource use
- Change in land management
- Inappropriate pest control
- Air pollution: Impact of atmospheric nitrogen deposition
- Hydrological changes
- Extraction: Non-living resources

Solent and Isle of Wight Lagoons SAC

Introduction

3.33 The Solent encompasses a series of coastal lagoons, including percolation, isolated and sluiced lagoons. This site includes several lagoons in the marshes near Keyhaven – Pennington, at Farlington Marshes in Chichester Harbour, at Bembridge Harbour and at Gilkicker near Gosport. These lagoons have a range of salinities and substrates, ranging from soft mud to muddy sand with a high proportion of shingle. Farlington Marshes is an isolated lagoon in marsh pasture, which is separated from the sea by a sea wall. It receives sea water only during spring tides. Its fauna is dominated by low-medium salinity insects. The lagoons at Bembridge Harbour lie in a depression behind the sea wall and sea water enters through percolation. Species diversity here is very high, including high densities of *N. vectensis*.

3.34 The habitats present in the Solent and Isle of Wight Lagoons SAC support high diversity faunal communities, including the rare foxtail stonewort *Lamprothamnium papulosum*, the scarce lagoon sand shrimp *Gammarus insensibilis* and the scarce starlet sea anemone *Nematostella vectensis.*

[20] http://publications.naturalengland.org.uk/publication/4692013588938752 [Accessed 30/05/2019]

Qualifying Features[21]

3.35 Annex I habitats that are a primary reason for selection of this site:

- Coastal lagoons

Conservation Objectives[22]

3.36 With regard to the SAC and the natural habitats and/or species for which the site has been designated (the 'Qualifying Features' listed below), and subject to natural change;

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

- The extent and distribution of qualifying natural habitats
- The structure and function (including typical species) of qualifying natural habitats, and
- The supporting processes on which qualifying natural habitats rely

Threats / Pressures to Site Integrity[23]

3.38 The following threats and pressures to the integrity of the Portsmouth Harbour SPA have been identified in the Natural England Site Improvement Plan:

- Hydrological changes
- Inappropriate weed control
- Coastal squeeze
- Invasive species
- Air pollution: Risk of atmospheric nitrogen deposition

[21] http://jncc.defra.gov.uk/protectedsites/sacselection/sac.asp?EUCode=UK0017073 [Accessed 30/05/2019]
[22] http://publications.naturalengland.org.uk/publication/5646122018144256 [Accessed 30/05/2019]
[23] http://publications.naturalengland.org.uk/publication/5670639268528128 [Accessed 30/05/2019]

4. Relevant Impact Pathways

Background to Recreational Pressure

4.1 There is growing concern over the cumulative impacts of recreation on key nature conservation sites in the UK, as most sites must fulfill conservation objectives while also providing recreational opportunity. Various research reports have provided compelling links between changes in housing and access levels, and impacts on European protected sites[24] [25]. This applies to any habitat, but the additional recreational pressure from housing growth on destinations with water features is likely to be especially strong and some of the qualifying waterfowl are known to be susceptible to disturbance. Different European sites are subject to different types of recreational pressures and have different vulnerabilities. Studies across a range of species have shown that the effects from recreation can be complex. HRAs of Local Plans tend to focus on recreational sources of disturbance as a result of new residents[26].

4.2 Human activity can affect birds either directly (e.g. by causing them to flee) or indirectly (e.g. by damaging their habitat or reducing their fitness in less obvious ways e.g. stress). The most obvious direct effect is that of immediate mortality such as death by shooting, but human activity can also lead to much more subtle behavioural (e.g. alterations in feeding behaviour, avoidance of certain areas and use of sub optimal areas etc.) and physiological changes (e.g. an increase in heart rate). While these are less noticeable, they might result in major population-level changes by altering the balance between immigration/birth and emigration/death[27].

4.3 Concern regarding the effects of disturbance on birds stems from the fact that they are expending energy unnecessarily and the time they spend responding to disturbance is time that is not spent feeding[28]. Disturbance therefore risks increasing energetic expenditure of birds while reducing their energetic intake, which can adversely affect the 'condition' and ultimately survival of the birds. Additionally, displacement of birds from one feeding site to others can increase the pressure on the resources available within the remaining sites, as they then must sustain a greater number of birds[29]. Moreover, the more time a breeding bird spends disturbed from its nest, the more its eggs are likely to cool and the more vulnerable they, or any nestlings, are to predators. Recreational effects on ground-nesting birds are particularly severe, with many studies concluding that urban sites support lower densities of key species, such as stone curlew and nightjar[30] [31]. Recreation disturbance in winter can be more adverse because birds are more vulnerable at this time of year due to food shortages.

4.4 Evidence in the literature suggests that the magnitude of disturbance clearly differs between different types of recreational activities. For example, dog walking leads to a significantly higher reduction in bird diversity and abundance than hiking[32]. Scientific evidence also suggests that key disturbance parameters, such as areas of influence and flush distance, are significantly greater for dog walkers than hikers[33]. A UK meta-analysis suggests that important spatial (e.g. the area of a site potentially influenced) and temporal (e.g.

[24] Liley D, Clarke R.T., Mallord J.W., Bullock J.M. 2006a. The effect of urban development and human disturbance on the distribution and abundance of nightjars on the Thames Basin and Dorset Heaths. Natural England / Footprint Ecology.
[25] Liley D., Clarke R.T., Underhill-Day J., Tyldesley D.T. 2006b. Evidence to support the appropriate Assessment of development plans and projects in south-east Dorset. Footprint Ecology / Dorset County Council.
[26] The RTPI report 'Planning for an Ageing Population'(2004) which states that 'From being a marginalised group in society, the elderly are now a force to be reckoned with and increasingly seen as a market to be wooed by the leisure and tourist industries. There are more of them and generally they have more time and more money.' It also states that 'Participation in most physical activities shows a significant decline after the age of 50. The exceptions to this are walking, golf, bowls and sailing, where participation rates hold up well into the 70s'.
[27] Riley, J. 2003. Review of Recreational Disturbance Research on Selected Wildlife in Scotland. Scottish Natural Heritage.
[28] Riddington, R. *et al*. 1996. The impact of disturbance on the behaviour and energy budgets of Brent geese. *Bird Study* 43:269-279
[29] Gill, J.A., Sutherland, W.J. & Norris, K. 1998. The consequences of human disturbance for estuarine birds. *RSPB Conservation Review* 12: 67-72
[30] Clarke R.T., Liley D., Sharp J.M., Green R.E. 2013. Building development and roads: Implications for the distribution of stone curlews across the Brecks. PLOS ONE. doi:10.1371/journal.pone.0072984.
[31] Liley D., Clarke R.T. 2003. The impact of urban development and human disturbance on the numbers of nightjar *Caprimulgus europaeus* on heathlands in Dorset, England. Biological Conservation 114: 219-230.
[32] Banks P.B., Bryant J.Y. 2007. Four-legged friend or foe? Dog walking displaces native birds from natural areas. Biology Letters 3: 14pp.
[33] Miller S.G., Knight R.L., Miller C.K. 2001. Wildlife responses to pedestrians and dogs. 29: 124-132.

how often or long an activity is carried out) parameters differ between recreational activities, suggesting that activity type is a factor that should be taken into account by HRAs[34].

4.5 Disturbance can also result from a wider urbanisation effect that might pose a much more direct threat to survival, such as in the case of predation by dogs and cats. Dogs are often exercised off-lead and roam out of sight of their owners, and have been documented to kill ground-nesting birds. Cats tend to roam freely at night, potentially seeking out prey many kilometres away from their home.

Non-breeding birds (September to March)

4.6 Because the European sites surrounding the Portsmouth seafront are designated for overwintering waterfowl, this section discusses academic research available on this functional group of birds.

4.7 The potential for disturbance may be different in winter than in summer, in that there are often a smaller number of recreational users. Furthermore, the impacts of disturbance at a population level may be reduced because birds are not breeding. However, recreational disturbance in winter may still have negative impacts, because birds face seasonal food shortages and are likely to be susceptible to any nutritional loss. Therefore, the abandonment of suitable feeding areas due to disturbance can have serious consequences for their ability to find suitable alternative feeding sites.

4.8 Tuite et al[35] used a large (379 sites), long-term (10-year) dataset (September – March species counts) to correlate seasonal changes in wildfowl abundance with the presence of various recreational activities. They determined that the shoveler was one of the most sensitive species to recreational activities, such as sailing/windsurfing and rowing. Studies on recreation in the Solent have established that human leisure activities cause direct disturbance to wintering waterfowl populations[36] [37].

4.9 A recent study on recreational disturbance on the Humber[38] assesses different types of noise disturbance on waterfowl referring to studies relating to aircraft (see Drewitt 1999[39]), traffic (Reijnen, Foppen, & Veenbaas 1997)[40], dogs (Lord, Waas, & Innes 1997[41]; Banks & Bryant 2007[42]) and machinery (Delaney et al. 1999; Tempel & Gutierrez 2003). These studies identified that there is still relatively little work on the effects of different types of water based craft and the impacts from jet skis, kite surfers, windsurfers etc. (see Kirby et al. 2004[43] for a review). Some types of disturbance are clearly likely to invoke different responses. In very general terms, both distance from the source of disturbance and the scale of the disturbance (noise level, group size) will both influence the response (Delaney et al. 1999[44]; Beale & Monaghan 2005[45]). On UK estuaries and coastal sites, a review of WeBS data showed that, among the volunteer WeBS surveyors, driving of motor vehicles and shooting were the two activities most perceived to cause disturbance (Robinson & Pollitt 2002)[46].

4.10 Disturbing activities present themselves on a continuum. Generally, activities that involve irregular, infrequent and loud noise events, movement or vibration are likely to be the most disturbing. For example, the presence of dogs around water bodies generate substantial disturbance due the areas accessed and

[34] Weitowitz D., Panter C., Hoskin R., Liley D. The spatio-temporal footprint of key recreation activities in European protected sites. Manuscript in preparation.
[35] Tuite, C.H., Hanson, P.R. & Owen, M. 1984. Some ecological factors affecting winter wildfowl distribution on inland waters in England and Wales and the influence of water-based recreation. *Journal of Applied Ecology* 21: 41-62
[36] Footprint Ecology. 2010. Recreational Disturbance to Birds on the Humber Estuary
[37] Footprint Ecology, Jonathan Cox Associates & Bournemouth University. 2010. Solent disturbance and mitigation project – various reports.
[38] Helen Fearnley Durwyn Liley and Katie Cruickshanks (2012) Results of Recreational Visitor Survey across the Humber Estuary produced by Footprint Ecology
[39] Drewitt, A. (1999) Disturbance effects of aircraft on birds. English Nature, Peterborough.
[40] Reijnen, R., Foppen, R. & Veenbaas, G. (1997) Disturbance by traffic of breeding birds: evaluation of the effect and considerations in planning and managing road corridors. Biodiversity and Conservation, 6, 567-581.
[41] Lord, A., Waas, J.R. & Innes, J. (1997) Effects of human activity on the behaviour of northern New Zealand dotterel Charadrius obscurus aquilonius chicks. Biological Conservation, 82,15-20.
[42] Banks, P.B. & Bryant, J.V. (2007) Four-legged friend of foe? Dog-walking displaces native birds from natural areas. Biology Letters, 3, 611-613.
[43] Kirby, J.S., Clee, C. & Seager, V. (1993) Impact and extent of recreational disturbance to wader roosts on the Dee estuary: some preliminary results. Wader Study Group Bulletin, 68, 53-58.
[44] Delaney, D.K., Grubb, T.G., Beier, P., Pater, L.L.M. & Reiser, H. (1999) Effects of Helicopter Noise on Mexican Spotted Owls. The Journal of Wildlife Management, 63, 60-76.
[45] Beale, C.M. & Monaghan, P. (2005) Modeling the Effects of Limiting the Number of Visitors on Failure Rates of Seabird Nests. Conservation Biology, 19, 2015-2019.
[46] Robinson, J.A. & Pollitt, M.S. (2002) Sources and extent of human disturbance to waterbirds in the UK: an analysis of Wetland Bird Survey data, 1995/96 to 1998/99: Less than 32% of counters record disturbance at their site, with differences in causes between coastal and inland sites. Bird Study, 49, 205.

their impact on bird behaviour. Birds are least likely to be disturbed by activities that involve regular, frequent, predictable and quiet patterns of sound, movement or vibration. The further any activity is from the birds, the less likely it is to result in disturbance. Therefore, the factors that determine species responses to disturbance include species sensitivity, timing/duration of the recreational activity and the distance between source and receptor of disturbance.

4.11 As part of the Bird Aware Solent Project, a study monitoring bird disturbance across 20 different locations was undertaken between December 2009 and February 2010[47]. This involved recording all recreational activities and relating these to behavioural responses of birds in pre-defined focal areas of intertidal habitat. The study recorded a total of 2,507 potential disturbance events, generating 4,064 species-specific behaviours. Roughly 20% of recorded events resulted in disturbance of waterfowl, including behaviours such as becoming alert, walking / swimming away, short flights (< 50m) or major flights. Generally, the likelihood of disturbance decreased with increasing distance to the disturbance stimulus (i.e. the recreational activity being undertaken). Importantly, the study also illustrated that recreational activities in the intertidal zone have the highest disturbance potential (41% of recorded events resulted in disturbance), followed by water-based activities (25%) and shore-based activities (12%).

4.12 The specific distance at which a species takes flight when disturbed is known as the 'tolerance distance' (also called the 'escape distance') and greatly differs between species. The tolerance distances of the study carried out for the Bird Aware project are summarised in Table 1. It is reasonable to assume from this evidence that disturbance is unlikely to be relevant at distances of beyond 200m. The data show that the sensitivity to disturbance differ between species, but that the intra-specific variation in response to disturbance is equally important. It was also examined how disturbance to different recreational activities varies between species, but for most species the number of recorded events was not enough for comparison (except for brent goose, oystercatcher and redshank). The results suggest that species might respond to recreational activities differently. For example, brent geese responded to dog walkers much further away than oystercatcher and redshank.

Table 1: Tolerance distances in metres of 16 species of waterfowl to various forms of recreational disturbance, as found in recent disturbance fieldwork[48]. The distances are provided both as a median and a range.

Species	Disturbance Distance (metres from stimulus)		Activity			
	Median	Range	Cycling	Dog walking	Jogging	Walking
Brent goose	51.5	5 - 178	100	95	30	50
Oystercatcher	46	10 - 200	150	45		50
Redshank	44.5	75 - 150	125	50	40	58
Curlew	75	25 - 200				
Turnstone	50	5 - 100				
Coot	12	10 - 20				
Mute swan	12	8 - 50				
Grey plover	75	30 - 125				
Little egret	75	30 - 200				
Wigeon	75.5	20 - 125				
Dunlin	75	25 - 300				
Shelduck	77.5	50 - 140				
Great-crested grebe	100	50 - 100				
Lapwing	75	18 - 125				
Teal	60	35 - 200				
Mallard	25	10 - 50				

[47] Liley D., Stillman R. & Fearnley H. 2011. The Solent Disturbance and Mitigation Project Phase 2: Results of Bird Disturbance Fieldwork 2009/10. Report by Footprint Ecology for the Solent Forum.
[48] Ibid.

4.13 The most recent visitor surveys conducted in the Solent in winter 2017 / 2018, indicated that visitors travelled distances between 76m and 300km to visit their Solent destination, with a mean distance of 8.4km and a median distance of 1.4km[49]. While the Solent therefore is clearly visited by people from across England, the recreation patterns are clearly driven by local Solent residents. This is reflected in the Interim Solent Recreation Mitigation Strategy[50], which established that a zone of influence of 5.6km around the SPAs in the Solent is to be used, comparable to other European sites such as the Thames Basin Heaths SPA and the Dorset Heathlands SPA. All housing developments within this catchment are to provide financial contributions to mitigation measures employed to buffer these sites against adverse effects. This catchment zone is particularly relevant to the Portsmouth Seafront Masterplan, as this proposes the potential development of hotels and residential dwellings within 5.6km of the Portsmouth Harbour SPA / Ramsar and the Chichester and Langstone Harbours SPA / Ramsar. As discussed above, any development within this zone is assumed to result in a Likely Significant Effect and will require mitigation, unless a project-level HRA demonstrates otherwise.

Visual and noise disturbance

4.14 An increasing amount of research on visual and noise disturbance of waterfowl from construction (and other activities) is now available. Both processes might elicit disturbance responses, and thereby affect the fitness and survival of wildfowl. For example, noise is a complex disturbance parameter requiring the consideration of several features, including the fact that it is not described on a linear scale, its non-additive effect and the source-receptor distance. A high level of noise disturbance constitutes a sudden noise event of over 60dB or prolonged noise of over 72dB. Responses to high noise levels include major flight or the cessation of feeding, both of which might affect the survival of birds if other stressors are present (e.g. cold weather, food scarcity).

4.15 Generally, previous research has shown that above noise levels of 84dB waterfowl show a flight response, while at levels below 55dB there is no effect on their behaviour[51]. These two thresholds are therefore considered useful as defining two extremes. The same authors have shown that noise levels should be below 70dB at the bird, as birds will habituate to noise levels below this level[52]. Generally, noise is attenuated by 6dB with every doubling of distance from the source. Impact piling, the noisiest construction process of approx. 110 dB at 0.67m from source, will therefore reduce to 67-68dB by 100m away from the source. The loudest construction noise should therefore have fallen to below disturbing levels by 100m, and certainly by 200m, away from the source even without mitigation.

4.16 Visual disturbance is generally considered to have a higher impact than noise disturbance as, in most instances, visual stimuli will elicit a disturbance response at much higher distances than noise[53]. For example, a flight response is triggered in most species when approached to within 150m across a mudflat. Visual disturbance can be exacerbated by workers operating outside with equipment, undertaking sudden movements and using large machinery. Several species are particularly sensitive to visual disturbance, including curlew (taking flight at 275m), redshank (at 250m), shelduck (at 199m) and bar-tailed godwit (at 163m). Therefore, specific regard should be given to assemblage composition when identifying threshold levels for both visual and noise disturbance.

4.17 The available baseline information suggests that the following European Sites are vulnerable to disturbance from the impact pathways recreational pressure, and visual and noise disturbance due to the presence of waterfowl:

- **Portsmouth Harbour SPA / Ramsar**
- **Chichester and Langstone Harbours SPA / Ramsar**
- **Solent and Southampton Water SPA / Ramsar**

[49] Liley D. & Panter C. 2018. Solent Visitor Surveys, winter 2017-18. Unpublished report by Footprint Ecology for the Bird Aware Solent Project. 81pp
[50] http://www.birdaware.org/CHttpHandler.ashx?id=27309&p=0 [Accessed 15/07/2019]
[51] Cutts N & Allan J. 1999. Avifaunal Disturbance Assessment. Flood Defence Works: Saltend. Report to Environment Agency).
[52] Cutts, N., Phelps, A. and Burdon, D. (2009) Construction and waterfowl: Defining Sensitivity, Response, Impacts and Guidance. Report to Humber INCA, Institute of Estuarine and Coastal Studies, University of Hull.
[53] Research undertaken by the Institute of Estuarine & Costal Studies, University of Hull. 2013. Available at: http://bailey.persona-pi.com/Public-Inquiries/M4%20-%20Revised/11.3.67.pdf [Accessed 17/07/2019]

4.18 However, the closest publicly accessible portion of the Solent and Southampton Water SPA is 7.6km from the closest opportunity area in the Seafront Masterplan. Given this distance and considering that recreational pressure arising from the Masterplan is likely to be a more localised issue (i.e. limited to a 5.6km catchment zone as identified in previous visitor surveys), this site is not considered further in this HRA.

Background to Loss of Functionally Linked Land

4.19 While most European sites have been geographically defined to encompass the key features that are necessary for coherence of their structure and function, and the support of their qualifying features, this is not necessarily the case. A diverse array of qualifying species including birds, bats and amphibians are not always confined to the boundary of designated sites.

4.20 For example, the highly mobile nature of both wildfowl and heathland birds implies that areas of habitat of crucial importance to the maintenance of their populations are outside the physical limits of European sites. Despite not being designated, this area is still integral to the maintenance of the structure and function of the interest feature on the designated site and, therefore, land use plans that may affect such areas should be subject to further assessment. Studies have documented that nightjar forage outside European site boundaries and that woodlark may use non-designated sites as their wintering grounds. Horseshoe bats also utilise functionally linked land distant from their breeding sites for activities such as foraging.

4.21 There is now an abundance of authoritative examples of HRA cases on plans affecting bird populations, where Natural England recognised the potential importance of functionally linked land[54]. For example, bird surveys in relation to a previous HRA established that approximately 25% of the golden plover population in the Somerset Levels and Moors SPA were affected while on functionally linked land, and this required the inclusion of mitigation measures in the relevant plan policy wording. Another important case study originates from the Mersey Estuary SPA / Ramsar, where adjacently located functionally linked land had a peak survey count of 108% of the 5 year mean peak population of golden plover. As in the above example, this led to considerable amendments in the planning proposal to ensure that the site integrity was not adversely affected.

4.22 Generally, the identification of an area as functionally linked land is now a relatively straightforward process. However, the importance of non-designated land parcels may not be apparent and could require the analysis of existing data sources to be firmly established. In some instances, data may not be available at all, requiring some further survey work.

4.23 The Solent Waders and Brent Goose Strategy[55], a conservation partnership project focusing particularly on brent geese and wading birds in the Solent, has undertaken surveys over three winters between 2016 and 2019. The strategy is an attempt to identify the sites these birds rely on in the Solent, outside of the boundaries of the formal designations. This network of functionally linked feeding and roosting sites has been mapped[56], identifying Core Areas, Primary Support Areas, Secondary Support Areas, Low Use areas and Candidate areas. For example, one of the key parcels of functionally linked land within Portsmouth is Southsea Common (P35), a Core feeding Area for brent Goose. Several other land parcels examined in the strategy are also relevant to the implementation of the Seafront Masterplan, because development is proposed nearby. This HRA has consulted the Solent Waders and Brent Goose Strategy to identify the main parcels of functionally linked land relevant to the Masterplan.

4.24 The available baseline information suggests that the following European Sites are vulnerable to the impact pathway loss of functionally linked land due to the mobility of waterfowl:

- **Portsmouth Harbour SPA / Ramsar**
- **Chichester and Langstone Harbours SPA / Ramsar**
- **Solent and Southampton Water SPA / Ramsar**

[54] Chapman C & Tyldesley D. 2016. Functional linkage: How areas that are functionally linked to European sites have been considered when they may be affected by plans and projects – A review of authoritative decisions. Natural England Commissioned Reports 207: 73pp.
[55] Available at https://solentwbgs.wordpress.com/ [Accessed 15/07/2019]
[56] Freely available to view online at: https://solentwbgs.wordpress.com/page-2/ [Accessed 15/07/2019]

Background to Tall Buildings and Light Pollution

4.25 Tall, manmade structures might have a variety of ecological impacts, particularly on bird species. It is now well known that such structures can interfere with the commuting or migration routes of a variety of species. Furthermore, tall buildings are also a physical obstacle, representing a direct risk of collision mortality.

4.26 Furthermore, the magnitude of effect of such landscape infrastructure is determined by various design features (e.g. building height, number of windows, level of illumination) and its location. For example, the constant illumination of some buildings such as hotels is thought to lead to an entrapment effect, preventing birds from successfully completing their commuting / migratory routes. Tall structures are also likely to have much more of an impact if they are positioned in an established corridor of commuting or migratory activity of birds. For example, this might prevent the birds' ability to use established feeding territories beyond newly built structures or alter the amount of energy required to get there.

4.27 The Seafront Masterplan details the provision of several leisure facilities such as hotels / spas, entertainment facilities and mixed-use development, which is likely to involve the delivery of at least some tall buildings. This HRA will set the development proposals into an ecological context, to identify where tall buildings might cause adverse effects on the integrity of European sites.

4.28 The available baseline information suggests that the following European Sites are vulnerable to the impact pathway tall buildings and light pollution due to their qualifying species:

- **Portsmouth Harbour SPA / Ramsar**
- **Chichester and Langstone Harbours SPA / Ramsar**
- **Solent and Southampton Water SPA / Ramsar**

4.29 However, the closest section of the Solent and Southampton Water SPA, i.e. the part to the south across a small section of sea, is 4.5km from the closest opportunity area in the Seafront Masterplan. Given this distance to the Solent and Southampton SPA, it is likely that brent geese from this area of the SPA will be using functionally linked land on the Isle of Wight. Any geese using the Seafront Masterplan area, are unlikely to be impacted by tall buildings, as these buildings are unlikely to be in their flight trajectory. Therefore, the Solent and Southampton Water SPA is screened out from further assessment in relation to the impact pathway of tall buildings and light pollution.

Background to Atmospheric Pollution

4.30 The main pollutants of concern for European sites are oxides of nitrogen (NOx), ammonia (NH_3) and sulphur dioxide (SO_2), and are summarised in Table 2. Ammonia can have a directly toxic effect upon vegetation, particularly at close distances to the source such as near road verges[57]. NOx can also be toxic at very high concentrations (far above the annual average critical level). However, in particular, high levels of NOx and NH_3 are likely to increase the total N deposition to soils, potentially leading to deleterious knock-on effects in resident ecosystems. Increases in nitrogen deposition from the atmosphere is widely known to enhance soil fertility and to lead to eutrophication. This often has adverse effects on the community composition and quality of semi-natural, nitrogen-limited terrestrial and aquatic habitats[58] [59].

[57] http://www.apis.ac.uk/overview/pollutants/overview_NOx.htm.
[58] Wolseley, P. A.; James, P. W.; Theobald, M. R.; Sutton, M. A. **2006.** Detecting changes in epiphytic lichen communities at sites affected by atmospheric ammonia from agricultural sources. Lichenologist 38: 161-176
[59] Dijk, N. **2011.** Dry deposition of ammonia gas drives species change faster than wet deposition of ammonium ions: evidence from a long-term field manipulation Global Change Biology 17: 3589-3607

Table 2: Main sources and effects of air pollutants on habitats and species[60]

Pollutant	Source	Effects on habitats and species
Sulphur Dioxide (SO_2)	The main sources of SO_2 are electricity generation, and industrial and domestic fuel combustion. However, total SO_2 emissions in the UK have decreased substantially since the 1980's. Another origin of sulphur dioxide is the shipping industry and high atmospheric concentrations of SO_2 have been documented in busy ports. In future years shipping is likely to become one of the most important contributors to SO_2 emissions in the UK.	Wet and dry deposition of SO_2 acidifies soils and freshwater, and may alter the composition of plant and animal communities. The magnitude of effects depends on levels of deposition, the buffering capacity of soils and the sensitivity of impacted species. However, SO_2 background levels have fallen considerably since the 1970's and are now not regarded a threat to plant communities. For example, decreases in Sulphur dioxide concentrations have been linked to returning lichen species and improved tree health in London.
Acid deposition	Leads to acidification of soils and freshwater via atmospheric deposition of SO_2, NOx, ammonia and hydrochloric acid. Acid deposition from rain has declined by 85% in the last 20 years, which most of this contributed by lower sulphate levels. Although future trends in S emissions and subsequent deposition to terrestrial and aquatic ecosystems will continue to decline, increased N emissions may cancel out any gains produced by reduced S levels.	Gaseous precursors (e.g. SO_2) can cause direct damage to sensitive vegetation, such as lichen, upon deposition. Can affect habitats and species through both wet (acid rain) and dry deposition. The effects of acidification include lowering of soil pH, leaf chlorosis, reduced decomposition rates, and compromised reproduction in birds / plants. Not all sites are equally susceptible to acidification. This varies depending on soil type, bed rock geology, weathering rate and buffering capacity. For example, sites with an underlying geology of granite, gneiss and quartz rich rocks tend to be more susceptible.
Ammonia (NH_3)	Ammonia is a reactive, soluble alkaline gas that is released following decomposition and volatilisation of animal wastes. It is a naturally occurring trace gas, but ammonia concentrations are directly related to the distribution of livestock. Ammonia reacts with acid pollutants such as the products of SO_2 and NO_X emissions to produce fine ammonium (NH_4+) - containing aerosol. Due to its significantly longer lifetime, NH_4+ may be transferred much longer distances (and can therefore be a significant trans-boundary issue). While ammonia deposition may be estimated from its atmospheric concentration, the deposition rates are strongly influenced by meteorology and ecosystem type.	The negative effect of NH_4+ may occur via direct toxicity, when uptake exceeds detoxification capacity and via N accumulation. Its main adverse effect is eutrophication, leading to species assemblages that are dominated by fast-growing and tall species. For example, a shift in dominance from heath species (lichens, mosses) to grasses is often seen. As emissions mostly occur at ground level in the rural environment and NH_3 is rapidly deposited, some of the most acute problems of NH_3 deposition are for small relict nature reserves located in intensive agricultural landscapes.
Nitrogen oxides (NO_x)	Nitrogen oxides are mostly produced in combustion processes. Half of NO_X emissions in the UK derive from motor vehicles, one quarter from power stations and the rest from other industrial and domestic combustion processes. In contrast to the steep decline in Sulphur dioxide emissions, nitrogen oxides are falling slowly due to	Direct toxicity effects of gaseous nitrates are likely to be important in areas close to the source (e.g. roadside verges). A critical level of NOx for all vegetation types has been set to 30 ug/m3. Deposition of nitrogen compounds (nitrates (NO_3), nitrogen dioxide (NO_2) and nitric acid (HNO_3))

[60] Information summarised from the Air Pollution Information System (http://www.apis.ac.uk/)

Pollutant	Source	Effects on habitats and species
	control strategies being offset by increasing numbers of vehicles.	contributes to the total nitrogen deposition and may lead to both soil and freshwater acidification. In addition, NO_x contributes to the eutrophication of soils and water, altering the species composition of plant communities at the expense of sensitive species.
Nitrogen deposition	The pollutants that contribute to the total nitrogen deposition derive mainly from oxidized (e.g. NO_X) or reduced (e.g. NH_3) nitrogen emissions (described separately above). While oxidized nitrogen mainly originates from major conurbations or highways, reduced nitrogen mostly derives from farming practices. The N pollutants together are a large contributor to acidification (see above).	All plants require nitrogen compounds to grow, but too much overall N is regarded as the major driver of biodiversity change globally. Species-rich plant communities with high proportions of slow-growing perennial species and bryophytes are most at risk from N eutrophication. This is because many semi-natural plants cannot assimilate the surplus N as well as many graminoid (grass) species. N deposition can also increase the risk of damage from abiotic factors, e.g. drought and frost.
Ozone (O_3)	A secondary pollutant generated by photochemical reactions involving NOx, volatile organic compounds (VOCs) and sunlight. These precursors are mainly released by the combustion of fossil fuels (as discussed above). Increasing anthropogenic emissions of ozone precursors in the UK have led to an increased number of days when ozone levels rise above 40ppb ('episodes' or 'smog'). Reducing ozone pollution is believed to require action at international level to reduce levels of the precursors that form ozone.	Concentrations of O_3 above 40 ppb can be toxic to both humans and wildlife, and can affect buildings. High O_3 concentrations are widely documented to cause damage to vegetation, including visible leaf damage, reduction in floral biomass, reduction in crop yield (e.g. cereal grains, tomato, potato), reduction in the number of flowers, decrease in forest production and altered species composition in semi-natural plant communities.

4.31 Sulphur dioxide emissions overwhelmingly derive from power stations and industrial processes that require the combustion of coal and oil, as well as (particularly on a local scale) shipping[61]. Ammonia emissions originate from agricultural practices[62], with some chemical processes also making notable contributions. As such, it is unlikely that material increases in SO_2 or NH_3 emissions will be associated with Local Plans. NOx emissions, however, are dominated by the output of vehicle exhausts (more than half of all emissions). A 'typical' housing development will contribute by far the largest portion to its overall NOx footprint (92%) through the associated road traffic. Other sources, although relevant, are of minor importance (8%) in comparison[63]. Emissions of NOx could therefore be reasonably expected to increase because of a higher number of vehicles due to implementation of the Masterplan in combination with growth across Portsmouth and beyond.

4.32 According to the World Health Organisation, the critical NOx concentration (critical threshold) for the protection of vegetation is 30 μgm^{-3}; the threshold for sulphur dioxide is 20 μgm^{-3}. In addition, ecological studies have determined 'critical loads'[64] of atmospheric nitrogen deposition (that is, NOx combined with ammonia NH_3).

[61] http://www.apis.ac.uk/overview/pollutants/overview_SO2.htm.
[62] Pain, B.F.; Weerden, T.J.; Chambers, B.J.; Phillips, V.R.; Jarvis, S.C. 1998. A new inventory for ammonia emissions from U.K. agriculture. Atmospheric Environment 32: 309-313
[63] Proportions calculated based upon data presented in Dore CJ et al. 2005. UK Emissions of Air Pollutants 1970 – 2003. UK National Atmospheric Emissions Inventory. http://www.airquality.co.uk/archive/index.php
[64] The critical load is the rate of deposition beyond which research indicates that adverse effects can reasonably be expected to occur

4.33 According to the Department of Transport's Transport Analysis Guidance, beyond 200m, the contribution of vehicle emissions from the roadside to local pollution levels is not significant[65] (Figure 3). This is therefore the distance that has been used throughout this HRA in order to determine whether European sites are likely to be significantly affected by development outlined in the Local Plan.

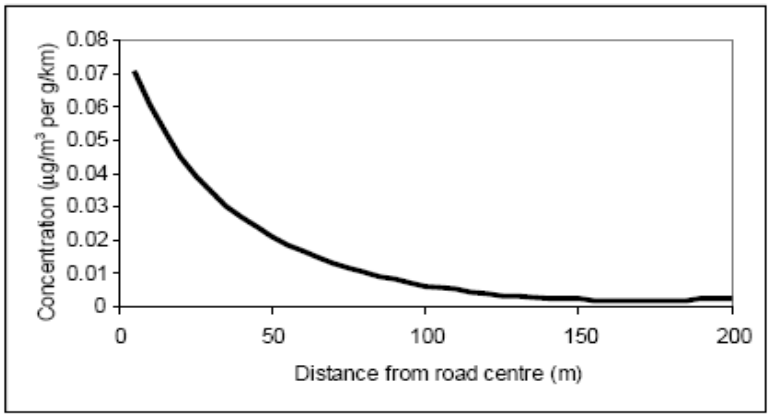

Figure 4: Traffic contribution to concentrations of pollutants at different distances from a road (Source: DfT[66])

4.34 Exhaust emissions from vehicles, particularly their nitrogen compounds, are capable of adversely affecting aquatic habitats. Considering this, an increase in net recreation and employment within the Portsmouth Seafront Masterplan area could result in increased traffic adjacent to nearby European sites, which might be sensitive to atmospheric pollution.

4.35 The available baseline information suggests that the following European Sites are vulnerable to the impact pathway atmospheric pollution due to their qualifying species / habitats:

- **Portsmouth Harbour SPA / Ramsar**
- **Chichester and Langstone Harbours SPA / Ramsar**
- **Solent and Southampton Water SPA**
- **Solent Maritime SAC**
- **Solent and Isle of Wight Lagoons SAC**

Background to Water Quality

4.36 The quality of the water that feeds European sites is an important determinant of the nature of their habitats and the species they support. Poor water quality can have a range of environmental impacts:

4.37 At high levels, toxic chemicals and metals can result in immediate death of aquatic life, and can have detrimental effects even at lower levels, including increased vulnerability to disease and changes in wildlife behaviour.

- Eutrophication, the enrichment of plant nutrients in water, increases plant growth and consequently results in oxygen depletion. Algal blooms, which commonly result from eutrophication, increase turbidity and decrease light penetration. The decomposition of organic wastes that often accompanies eutrophication deoxygenates water further, augmenting the oxygen depleting effects of eutrophication. In the marine environment, nitrogen is the limiting plant nutrient and so eutrophication is associated with discharges containing available nitrogen.
- Some pesticides, industrial chemicals, and components of sewage effluent are suspected to interfere with the functioning of the endocrine system, possibly having negative effects on the reproduction and development of aquatic life.

[65] http://www.dft.gov.uk/webtag/documents/expert/unit3.3.3.php#013; accessed 12/05/2016
[66] http://www.dft.gov.uk/ha/standards/dmrb/vol11/section3/ha20707.pdf; accessed 13/07/2018

4.38 Sewage and some industrial effluent discharges contribute to increased nutrients in the European sites and particularly to phosphate levels in watercourses.

4.39 The Seafront Masterplan provides for development in the Southern Water catchment, responsible for the public water supply and waste water treatment within the area. The potential implications of residential and industrial development for Natura 2000 sites are outlined in Table 3.

Table 3: Wastewater Treatment Works with catchments serving areas that are to provide new development.

WwTW Catchment	Plan providing for additional employment development	HRA implications
WwTWs operated by Southern Water and Portsmouth Water	Seafront Masterplan	Discharge of sewage and industrial pollutants into local watercourses (ultimately entering Portsmouth Harbour SPA / Ramsar, Chichester and Langstone Harbours SPA / Ramsar and Solent Maritime SAC)

4.40 The available baseline information suggests that the following European Sites are vulnerable to the impact pathway water quality:

- **Portsmouth Harbour SPA / Ramsar**
- **Chichester and Langstone Harbours SPA / Ramsar**
- **Solent and Southampton Water SPA**
- **Solent Maritime SAC**
- **Solent and Isle of Wight Lagoons SAC**

4.41 However, there is no direct hydrological connectivity between the Solent and Isle of Wight Lagoons SAC and the marine environment, except through percolation. Therefore, this site is screened out from further assessment relating to the impact pathway water quality.

5. Screening for Likely Significant Effects (LSEs)

Table of Development Opportunities

5.1 The Seafront Masterplan Review document focusses on specific sites that have the potential for development. The opportunities include a variety of measures, including the better use of a building or space, making a space or area more attractive, and the wholesale demolition and rebuilding of sites. The proposed development is intended to be delivered in several phases over a period of 10+ years.

5.2 Development is proposed in the following areas within the Portsmouth seafront:

- Old Portsmouth
- Clarence Pier
- Southsea Common (referred to in the remainder of this document as Southsea Common Opportunity Area to avoid confusion with the much smaller common)
- St. George's Road to Henderson Road
- Henderson Road to Eastney Point

5.3 Table 4 provides a summary of the different development proposals. It makes specific reference to sites where development is intended to take place, provides details of the development options and provides the distances to the closest European sites. It also provides the results of the screening for LSEs relating to the different development options. This includes all major proposal that are considered relevant to the integrity of European Sites. **The Seafront Masterplan only provides rough indications of where buildings will be delivered and it is therefore to be noted that the distances to European Sites provided in Table 4, and used in this screening report, are all approximate.**

5.4 While the impact pathway loss of functionally linked land was considered, none of the Seafront Masterplan development opportunities propose development on known functionally linked land parcels (see distances to functionally linked land provided in Table 4). This impact pathway is therefore not considered further in this HRA. However, several impact pathways (e.g. recreational pressure, tall buildings, visual and noise disturbance) are discussed in relation to key parcels of functionally linked land.

Table 4: Summary of the main proposed development opportunities detailed in the Portsmouth Seafront Masterplan, detailing the general opportunity area, a more specific location within the areas, the relative location to European Sites and the screening decisions on the proposals.

Opportunity Area	Specific Site Within Area	Details of Development Option	Link to European Sites	Likely Significant Effects Arising From Plan
Old Portsmouth	Former Wightlink Site	Redevelopment of car parks and buildings for a mix of employment uses Furthermore, a scheme involved some residential development and a cultural hub is also proposed.	The development site is relatively close to the Portsmouth Harbour SPA / Ramsar (913m), but far from the Chichester and Langstone Harbours SPA / Ramsar (4.5km). It is relatively close to P100, a Low Use area for feeding brent geese (functionally linked land).	**This proposal will result in LSEs on European Sites.** **The following impact pathways are present:** • **Recreational pressure (on SPA / Ramsar and functionally linked land)** This development proposal is screened in for Appropriate Assessment.
	Fish Market Site	Introduction of other uses on the fish market site, such as	The development site is relatively close to Portsmouth Harbour SPA / Ramsar (1.1km),	**This proposal will result in LSEs on European Sites.**

		arts, foods / beverages and residential	but far from the Chichester and Langstone Harbours SPA / Ramsar (4.3km). It is relatively close to P100, a Low Use area for feeding brent geese (functionally linked land).	**The following impact pathways are present:** • **Recreational pressure (on SPA / Ramsar and functionally linked land)** This development proposal is screened in for Appropriate Assessment.
	The Point, Spice Island	Enhancement of public space in terms of appearance, materials and lighting to increase use especially for art-related activities	The development site is relatively close to the Portsmouth Harbour SPA / Ramsar (876m), but far from the Chichester and Langstone Harbours SPA / Ramsar (4.6km). It is relatively close to P100, a Low Use area for feeding brent geese (functionally linked land).	There are no impact pathways present. Through redevelopment this proposal might increase the footfall in the wider area. However, despite the proximity of this development site to the Portsmouth Harbour SPA / Ramsar and P100, there are no linking impact pathways. Both the SPA / Ramsar and supporting habitat are difficult to access from here. This development proposal is thus screened out from Appropriate Assessment.
	Broad Street Highway Enhancement	Top of Broad Street and Bath Square proposed to be pedestrianised to increase pedestrian focus The existing Round Tower is to be enhanced for active use	The development site is relatively close to the Portsmouth Harbour SPA / Ramsar (899m), but far from the Chichester and Langstone Harbours SPA / Ramsar (4.4km). It is relatively close to P100, a Low Use area for feeding brent geese (functionally linked land).	There are no impact pathways present. This proposal does not outline development that may impact European Sites. However, the pedestrianisation of the area might reduce atmospheric pollution locally. This development proposal is thus screened out from Appropriate Assessment.
Clarence Pier	Entire Area	Redevelopment of the entire area to create a complementary destination to the Historic Dockyard, Gunwharf Quays and Old Portsmouth Redevelopment likely to include a masterplanning approach and development of restaurants, bars, a hotel, leisure uses and a new hovercraft terminal	While the area is distant to Portsmouth Harbour SPA / Ramsar (3.5km) and Chichester and Langstone Harbours SPA / Ramsar (4km), it is immediately adjacent to Southsea Common (P35), a Core Area for feeding brent geese (functionally linked land)	**This proposal will result in LSEs on European Sites.** **The following impact pathways are present:** • **Recreational pressure (on SPA / Ramsar and functionally linked land)** • **Obstruction of flight lines and sightlines** • **Visual and noise pollution (during and post-construction)** This development proposal is screened in for Appropriate Assessment.
	Southsea Castle to Palmerston Road	The development option suggests the redevelopment of the Blue Reef Aquarium with a more attractive building, as well as introducing a new building / attraction in its vicinity Redesigning of the route to create a more attractive	Long distances to Portsmouth Harbour SPA / Ramsar and Chichester and Langstone Harbours SPA / Ramsar; however adjacent to Southsea Common (P35), a Core Area supporting brent geese	**This proposal will result in LSEs on European Sites.** **The following impact pathways are present:** • **Recreational pressure (on SPA / Ramsar and functionally linked land)** • **Obstruction of flight lines and sightlines**

		environment for pedestrians, thus building a stronger link between Southsea town centre and the seafront		• **Visual and noise pollution (during and post-construction)** This development proposal is screened in for Appropriate Assessment.
Southsea Common Opportunity Area	Southsea Skate Park	Creation of landscaped public space and new adventure play park	Long distances of 2.6km to the Portsmouth Harbour SPA / Ramsar and 3.2km to the Chichester and Langstone Harbours SPA / Ramsar; however only 45m away from a Candidate support area (P34), 271m away from a Secondary Support Area (P115) and 299m away from Southsea Common, a Core Area (P35) supporting brent geese.	There are no impact pathways present. Despite the proximity of this development area to several supporting habitats for Brent geese, this plan does not allocate any development that has a linking impact pathway to European Sites. This is mainly due to the skate park representing the focal destination and visitors being unlikely to visit the wider Solent coastline and / or engaging in water-based activities. Furthermore, the skate park would be within an urban area with high levels of existing use. This development proposal is thus screened out from Appropriate Assessment.
	The Pyramids Centre	Comprehensive redevelopment of the Pyramids site for leisure-led uses, possibly including a hotel / spa, and potentially residential use	Long distances of 2.8km to the Portsmouth Harbour SPA / Ramsar and 3.1km to the Chichester and Langstone Harbours SPA / Ramsar; however directly adjacent to a Candidate support area (P34), 182m away from a Secondary Support Area (P115) and 462m away from Southsea Common, a Core Area (P35) supporting brent geese.	**This proposal will result in LSEs on European Sites.** **The following impact pathways are present:** • **Recreational pressure (on SPA / Ramsar and functionally linked land)** • **Obstruction of flight lines and sightlines** • **Visual and noise pollution (during and post-construction)** • **Water quality** This development proposal is screened in for Appropriate Assessment.
	Speakers' Corner, South Parade Gardens and Rock Gardens	Pedestrianisation of Clarence Esplanade to create more space for walking / cycling routes Integration of Rock Gardens and enhancement of Speaker's Corner to create more footfall, including the provision of a leisure cluster with focus on food and beverage	Speaker's Corner is located approx. 2.5km from Chichester and Langstone Harbours SPA / Ramsar and 3km from Solent Maritime SAC; however it lies within 100m of a Low Use feeding area (P115) for brent geese.	There are no impact pathways present. Despite the proximity of this site to an area of Low Use for brent geese, this plan does not allocate any development that has a linking impact pathway to European Sites. Furthermore, the only nearby supporting area has a low level of use. This development proposal is thus screened out from Appropriate Assessment.
	South Parade Pier and St. Helen's Parade	Improve the pedestrian and cycle experience in the area by narrowing the carriageway and shifting car parking to the north side of the road	Long distances of 3.4km to the Portsmouth Harbour SPA / Ramsar and 2.4km to the Chichester and Langstone Harbours SPA / Ramsar; however directly adjacent to a support area of Low Use (P133)	There are no impact pathways present. Despite the proximity of this site to several areas of brent goose supporting habitat, this plan does not allocate any development that has a linking impact pathway to European Sites.

		Expand on the existing public space with provision of food and beverage offers	and 552m away from a support Core Area (P32A).	This development proposal is thus screened out from Appropriate Assessment.
	Canoe Lake Park to St. George's Road	Continued promotion of the Canoe Lake Park as a recreational destination and improvement of play spaces and equipment to increase its capacity. The former Barrack building in the area is to be redeveloped for active use, such as an event / exhibition space	Long distances of 3.5km to the Portsmouth Harbour SPA / Ramsar and 1.4km to the Chichester and Langstone Harbours SPA / Ramsar; however directly adjacent to a Core Support Area (P32A) and a support area of Low Use (P133). Additionally, the development area is 133m from a Secondary Support Area (P32B).	There are no impact pathways present. Despite the proximity of this site to several areas of brent goose supporting habitat, this plan does not allocate any development that has a linking impact pathway to European Sites. While the proposals might increase recreational pressure in the area, this is already a frequently visited area. Furthermore, the continued promotion of the Canoe Lake as a high-value recreational destination might keep people from visiting the more sensitive SPAs / Ramsars. This development proposal is thus screened out from Appropriate Assessment.
St. George's Road to Henderson Road	Entire Area	Conversion of the currently vacant Royal Marines Museum to a hotel (or similar), with complimentary uses such as offices and residential Redevelopment of Eastney Swimming Pool (and potentially the wider Southsea Leisure Park) to accommodate a variety of leisure-type uses, including swimming and the continued support of watersports (e.g. stand-up paddle boarding and kite-surfng)	This opportunity area is located approx. 1.4lm from Chichester and Langstone Harbours SPA / Ramsar and 1.5km from the Solent Maritime SAC It lies approx. 1.2km from Core feeding Areas for brent geese (P32A and P31) and only approx. 182m from Primary Support Areas (roost sites P78, P142) for waders	**This proposal will result in LSEs on European Sites.** **The following impact pathways are present:** • **Recreational pressure (on SPA / Ramsar and functionally linked land)** • **Obstruction of flight lines and sightlines** • **Visual and noise pollution (during and post-construction)** • **Water quality** This development proposal is screened in for Appropriate Assessment.
Henderson Road to Eastney Point	Fort Cumberland	Opening Fort Cumberland for public uses, such as an activity centre, a start-up hub for new businesses and an events space	This opportunity area sits adjacent to the Chichester and Langstone Harbours SPA / Ramsar It is located approx. 650m from important supporting habitats for brent geese and approx. 400m from primary support areas for wading birds	**This proposal will result in LSEs on European Sites.** **The following impact pathways are present:** • **Visual and noise pollution (during and post-construction)** This development proposal is screened in for Appropriate Assessment.
	RNLI site	Redevelopment of the RNLI site for commercial and leisure uses, such as café and toilets or an ecology information centre (if the RNLI is relocated elsewhere)	This opportunity area sits adjacent to the Chichester and Langstone Harbours SPA / Ramsar It is located approx. 650m from important supporting habitats for brent geese and approx. 400m from primary support areas for wading birds	This proposal will result in LSEs on European Sites. **The following impact pathways are present:** • **Recreational pressure (on SPA / Ramsar and functionally linked land)** • **Visual and noise pollution (during and post-construction)**

			This development proposal is thus screened in for Appropriate Assessment.
Southsea Marina	Enhancement of the area with leisure-use facilities, such as café / restaurants, water sports equipment hire, cycle hire and holiday-let accommodation	This opportunity area sits adjacent to the Chichester and Langstone Harbours SPA / Ramsar It is located approx. 650m from important supporting habitats for brent geese and approx. 400m from primary support areas for wading birds	**This proposal will result in LSEs on European Sites.** **The following impact pathways are present:** • **Recreational pressure (on SPA / Ramsar and functionally linked land)** • **Visual and noise pollution (during and post-construction)** This development proposal is screened in for Appropriate Assessment.
Southsea Leisure Park	Redevelopment of the site to switch use from touring / static caravans to residential housing (pending further assessment)	This opportunity area is far (5.5km) from the Portsmouth Harbour SPA / Ramsar, but sits only 460m from the Chichester and Langstone Harbours SPA / Ramsar. Furthermore, it is located approx. 650m from important supporting habitats for brent geese and is directly adjacent to Primary Support Areas (roost sites) for wading birds.	**This proposal will result in LSEs on European Sites.** **The following impact pathways are present:** • **Recreational pressure (on SPA / Ramsar and functionally linked land)** • **Visual and noise pollution (during and post-construction)** This development proposal is screened in for Appropriate Assessment.
Hayling Ferry Pier	Replacement of the Hayling Ferry Pier as an architecturally distinctive location comparable to the Brisbane Ferry Terminals	This opportunity area sits adjacent to the Chichester and Langstone Harbours SPA / Ramsar It is located approx. 650m from important supporting habitats for brent geese and approx. 400m from primary support areas for wading birds	**This proposal will result in LSEs on European Sites.** **The following impact pathways are present:** • **Visual and noise pollution (during and post-construction)** This development proposal is screened in for Appropriate Assessment.

Screening of Development Opportunities

Old Portsmouth

5.5 The Old Portsmouth development area is located approx. 826m (Euclidean straight line distance) away from the Portsmouth SPA / Ramsar, separated by a stretch of sea. The Seafront Masterplan proposes the redevelopment of this area to provide for a mix of uses that could include leisure and residential development at the Former Wightlink site and, potentially, at the Fish Market site. There are also plans to make the opportunity area more attractive and, ultimately, to attract more people (see Table 4). For example, the redevelopment of the former Wightlink site to provide for a restaurant or café would mean more people spend their leisure time in Old Portsmouth.

5.6 Generally, there is no realistic pathway linking recreational use in Old Portsmouth to the Portsmouth SPA / Ramsar. The development site is separated from the SPA by a stretch of sea and there are no plans for building a ferry terminal and / or introducing a hub for water-based activities, either of which might move recreational pressure closer to this European site.

5.7 The closest area of key supporting habitat for brent Geese to Old Portsmouth that is identified in the Solent Waders and Brent Goose Strategy[67] is a 2.87ha area of low use (P100) to the north. However, this site lies beyond the Wightlink Ferry terminal and its serving train link, and there is thus no pathway that would connect the increased recreational pressure to this section of functionally linked land.

5.8 However, other brent geese supporting habitats include an area of Low Use (P36) and a Core Area (Southsea Common, P35) to the south-east of Old Portsmouth. Since these areas are less than 1km from the opportunity area, impacts of recreational pressure need to be considered. The Chichester and Langstone Harbours SPA / Ramsar is also within 5km and might be subject to increased recreational usage.

5.9 In conclusion, LSEs in relation to the development opportunities in Old Portsmouth cannot be excluded and are screened in for Appropriate Assessment.

Clarence Pier

5.10 The main focus of the Seafront Masterplan for the Clarence Pier is to redevelop the area with a variety of facilities, most of which already exist at the site, such as restaurant, bars, a hovercraft terminal and other leisure uses (Table 4). The proposed development option could therefore lead to increased recreation in the general waterfront area surrounding the pier, through intensification of the uses.

5.11 Clarence Pier area lies at an approximate straight-line distance of 3.5km to the Portsmouth Harbour SPA / Ramsar and approx. 4km to the Chichester and Langstone Harbours SPA / Ramsar. Any visitors to Clarence Pier are likely to specifically visit the redevelopment proposed in the Masterplan, such as the restaurants, bars and other leisure uses. It is very unlikely that Clarence Pier visitors will walk the considerable distances of 3.5km and 4km to the nearest European Sites, and as such the redevelopment is not considered to materially increase recreational pressure in the Portsmouth Harbour SPA / Ramsar and Chichester and Langstone Harbours SPA / Ramsar.

5.12 However, the Clarence Pier development area is immediately adjacent to Southsea Common (P35), a Core feeding Area for brent Geese. Furthermore, the SWBGS highlights that the presence of buildings within 50m-500m of a goose support area might make a site less suitable for supporting brent geese. Due to the likely increase of recreational pressure and the construction of new buildings, this development area proposed in the Seafront Masterplan is screened in for Appropriate Assessment.

Southsea Common Opportunity Area

Southsea Castle to Palmerston Road

5.13 Most importantly, the Masterplan proposes the replacement of the Blue Reef Aquarium with a building that has a potentially larger footprint (Table 4), which could result in a negative impact on the flightlines or sightlines of brent geese if it also results in a significant increase in building height or blocks an otherwise open view from the SPA or functionally linked land. Public realm improvements to Avenue de Caen, with the

[67] Solent Waders and Brent Goose Strategy. Available at https://solentwbgs.wordpress.com/ [Accessed 03/06/2019]

aim to build a stronger pedestrian link between Southsea town centre and the seafront is also proposed. Overall, the proposals for this development area are likely to lead to increased recreation levels.

5.14 The Southsea Castle to Palmerston Road area of development is relatively distant to the Portsmouth Harbour SPA / Ramsar (approx. 3.5km) and the Chichester and Langstone Harbours SPA / Ramsar (approx. 4km). While development of this area for pedestrians is likely to encourage a higher footfall originating from Southsea Common, it is considered unlikely that many visitors will walk the long routes along the shoreline to reach these SPAs / Ramsars.

5.15 However, the Avenue-de-Caen to Southsea Castle development area is directly adjacent to Southsea Common, a Core feeding Area for brent geese. Due to the likely increase of recreational pressure, the impact of potentially tall buildings on flightlines or sightlines and disturbance from construction this development plan is screened in for Appropriate Assessment.

The Pyramids and Speakers' Corner

5.16 The development option in this area outlines a landscaped public space with a new adventure play park, hotel / spa provision at the Pyramids and redevelopment of Speaker's Corner to encourage more footfall (Table 4). Implementing this development option might therefore lead to an increase in recreational pressure and to disturbance from buildings (during and post-construction). The proposed hotel / spa at the Pyramids site requires particular consideration, because it will contribute to an increase in the residential population within 5.6km of the coastal SPAs. Furthermore, the increase in the residential population as a result of the hotel would also mean that there might be an increase in the discharge of sewage effluent, which might have adverse effects on the integrity of marine SPAs / Ramsars / SACs.

5.17 Speaker's Corner is located approx. 2.9km from the Chichester and Langstone Harbours SPA / Ramsar and 3km from the Solent Maritime SAC. It is unlikely that people visiting the landscaped public space and the adventure play park, both specific recreation destinations, would walk to and access these European Sites. However, the development area lies immediately adjacent to a candidate feeding area (P34) and <100m away from a Low Use feeding area (P115) for brent geese.

5.18 Considering the likely increase in recreational pressure, the impact of potentially tall buildings on flightlines and sightlines, disturbance from construction work and an increased wastewater discharge this development proposal is screened in for Appropriate Assessment.

Canoe Lake Park to St. George's Road

5.19 The Canoe Lake was developed in 1896 and provides a popular destination for families. The development proposal identifies that the Lake will be consolidated as a destination for individuals, families and sports enthusiasts. Further enhancements to the play spaces, equipment and Japanese Garden are envisaged (Table 4).

5.20 The Canoe Lake development area has a relatively long distance of 3.5km to the Portsmouth Harbour SPA / Ramsar and 1.4km to the Chichester and Langstone Harbours SPA / Ramsar. The continued promotion of Canoe Lake as a recreational destination is likely to promote an increased footfall in this development area. The lake offers a variety of features, including the main boating lake, a large children's play area, tennis courts, a social pavilion, and food and beverage opportunities. It is therefore considered a focal target for recreation, where families spend a large part of the day. It is therefore considered unlikely that many Canoe Lake visitors will walk onwards to the European Sites. However, this development area is directly adjacent to a Core Support Area (P32A), an area of Low Use (P133) and 133m from a Secondary Support Area (P32B). It is therefore possible

5.21 By improving the appeal of the Canoe Lake, which is already a popular area for recreation, this proposal further intensifies the site as a focal point for recreation. This could be beneficial for European Sites as this might reduce recreational pressure in more sensitive areas of the beachfront. This proposal is therefore screened out from Appropriate Assessment.

St. George's Road to Henderson Road

5.22 Regarding the beachfront between St. George's Road and Henderson Road, the Seafront Masterplan highlights that any development that would have negative impacts on the special characteristics of this area (i.e. undeveloped openness, vegetated shingle), should be refused planning permission.

5.23 This opportunity area is located approx. 390m from Chichester and Langstone Harbours SPA / Ramsar and the Solent Maritime SAC. Furthermore, it lies approx. 119m from a Core feeding Area (P29) and other Core feeding Areas for brent geese (P32A and P31). It is only approx. 72m from Primary Support Areas (roost sites P78, P142) for waders.

5.24 The development proposal for this area highlights a conversion of the vacant Royal Marines Museum to a hotel, with possible ancillary uses such as offices and residential homes (Table 4). Furthermore, the redevelopment of Eastney Swimming Pool to provide new pool facilities, an increased support of watersports (e.g. paddle boarding, kite-surfing) and a new café is highlighted. The proposed conversion of the museum to a hotel and ancillary residential use requires particularly consideration, because it will contribute to an increase in the residential population within 5.6km of the coastal SPAs. Moreover, the residents would only have a short walk and have easy access to the Chichester and Langstone Harbours SPA / Ramsar. The increase in the residential population would also mean that there might be an increase in the discharge of sewage effluent, which might have adverse effects on the integrity of the marine SPAs / Ramsars / SACs.

5.25 If development of the hotel resulted in a significant increase in building height and / or it would block an otherwise uninterrupted view from the SPA or functionally linked land, this could result in a negative impact on the flightlines or sightlines of brent geese.

5.26 The proposals for the St. George's Road to Henderson Road area are likely to result in increased recreational pressure in the wider area, potential impacts on flightlines and sightlines of brent geese, and visual and noise disturbance (during and post-construction). This development option is therefore screened in for Appropriate Assessment.

Henderson Road to Eastney Point

5.27 This development plan proposes to open Fort Cumberland, a heritage asset, for a wide range of uses, including an activity centre, a start-up hub for new businesses and an entertainment / events space. Southsea Marina is proposed as a site for new leisure uses, including a café / restaurant, watersports equipment hire facilities and holiday-let accommodation. Further locations for redevelopment include the RNLI facility (if relocated) as a café or ecology information centre and the Hayling Ferry Pier.

5.28 The development area is located directly adjacent to the Chichester and Langstone Harbours SPA / Ramsar. It is also within 650m of brent geese supporting habitat and within 400m of a Primary Support Area for wading birds.

5.29 This development option is likely to increase recreational pressure in the Chichester and Langstone Harbours SPA / Ramsar (and key supporting habitats for qualifying bird species) and to result in disturbance / obstruction from buildings (during and post-construction). It is therefore screened in for Appropriate Assessment.

6. Appropriate Assessment

Recreational Pressure

6.1 Any development in coastal sites that involves the enhancement or provision of additional infrastructure, is likely to increase the recreational use of coastal areas. In turn this increase in recreational pressure has the potential to affect the sensitive avian communities that nearby European sites are designated for. This is interconnected to the loss of functionally linked land (see next section), as the increase in recreational use might affect areas outside designated site boundaries, which qualifying bird species might rely upon for feeding and / or roosting.

6.2 While recreational pressure is primarily affected by the number of homes within specific catchment areas of European sites, the enhancement of leisure facilities is also likely to attract additional visitors. This can pose a particular problem where the type of facility introduced / expanded involves activities that may result in LSEs on European sites.

6.3 This HRA takes a two-fold approach to undertaking the Appropriate Assessment for the impact pathway recreational pressure. It first discusses the development proposals that might result in an increased recreational footfall or 'business' in the Portsmouth Seafront. It then addresses residential development that might lead to a net increase in the local residential population.

Proposals increasing recreational footfall

Old Portsmouth

6.4 Aside from the proposal for a mixed-use development that includes residential use (discussed in the next section), the Seafront Masterplan provides for the following in the Old Portsmouth opportunity area:

- **New restaurants**
- **New cafes**
- **Cultural hub**

6.5 While this site lies relatively close to P100, a support area of Low Use, it is unlikely that the additional recreational footfall created by this proposal will affect this parcel of functionally linked land. P100 is directly adjacent to the Wightlink ferry terminal in an industrial area. Most people visiting the Old Portsmouth area will specifically visit these new services / attractions, and are unlikely to venture into the industrial area to the north. Any visitors with the intention of accessing the wider Solent region, are more likely to walk towards Clarence Pier and therefore P36 (a Low Use support area) and Southsea Common P35 (a Core Support Area).

6.6 However, the additional recreational footfall in these support areas due to development of recreational services in Old Portsmouth, is unlikely to materially alter how the brent geese use these sites. Both areas, and especially P35, act as important functionally linked land to the SPAs / Ramsars despite the existing high levels of recreational use (discussed in more detail in relation to Clarence Pier below). It is therefore concluded that **the redevelopment of Old Portsmouth will not lead to adverse effects regarding the impact pathway recreational pressure**.

Clarence Pier

6.7 The Seafront Masterplan envisages the redevelopment of Clarence Pier to provide the following:

- **New restaurants**
- **New bars**
- **Leisure uses**

6.8 Overall, this proposal is likely to significantly increase the recreational footfall in the area. While the destinations and activities of most visitors are likely to be specific (e.g. visiting a specific restaurant or bar),

it equally cannot be excluded that a sizable proportion of visitors will spend time on Southsea Common (P35), a Core Area for brent geese, which is located nearby.

6.9 Bird Aware Solent investigated the effects of recreation on Solent birdlife. Quoting results of this fieldwork, the HRA of a previous version of the Portsmouth Seafront Masterplan concluded that this section of the coast received over 3 million visits per year, yet brent geese were continuing to forage successfully. Of the 5 species investigated (brent goose, redshank, grey plover, little egret and dunlin), brent geese were least susceptible to disturbance when measured as major flight.

6.10 Additional surveys were undertaken for the Solent Waders and Brent Goose Strategy. As for Bird Aware Solent, the results showed that a recreational presence does not influence how supporting habitat is used by the geese. For example, on 13 survey occasions where disturbance events were noted, geese were also observed feeding.

6.11 While, the response of brent geese to disturbance is variable, most active disturbance responses are triggered at distances of below 100m. Visitors of Southsea Common are free to walk anywhere on the common, which might often bring them within flight distances of the geese. Due to the by-laws on commons it is not feasible to restrict public access during the wintering months, but a possible mitigation measure would be to introduce a dog-on-lead policy, which would reduce the number of disturbance events related to free-roaming dogs.

6.12 However, given that brent geese use Southsea Common despite the current high levels of recreational use, and that inter-individual responses to disturbance vary significantly, **the redevelopment of Clarence Pier will not lead to adverse effects regarding the impact pathway recreational pressure**.

Southsea Common Opportunity Area

6.13 Aside from the provision of a new hotel / spa (discussed in the following section), the Seafront Masterplan outlines the following development for the Pyramids site:

- **Improvement of the pedestrian link between the seafront and Southsea town centre**
- **Redevelopment of the Blue Reef Aquarium for enhanced leisure use**
- **Enhancement to Rock Gardens and Speakers' Corner to increase footfall**

6.14 These proposals clearly have the potential to increase the recreational footfall in the area. Due to the distances of 2.9km to the Chichester and Langstone Harbours SPA / Ramsar and 3km to the Solent Maritime SAC it is considered unlikely that the additional footfall will affect the SPAs / Ramsars. However, these locations are close to functionally linked land parcels for brent geese, such as a Classification Candidate site (P34) and a Low Use feeding area (P115).

6.15 However, given that brent geese successfully feed in other areas that are subject to high recreational disturbance (e.g. Southsea Common) and the relevant support areas only being of low use / awaiting approval for classification, **enhancement of the Rock Gardens and Speakers' Corner for public use will not lead to adverse effects regarding the impact pathway recreational pressure.**

Henderson Road to Eastney Point

6.16 The Seafront Masterplan proposes that if the RNLI facility were relocated elsewhere, the site could be redeveloped for other uses, such as a café and toilets with an integrated nature and ecology information centre. The proposal also suggests an enhancement of the nearby bus stop. Given that the RNLI site is immediately adjacent to the Chichester and Langstone Harbours SPA / Ramsar, this proposal is likely to result in increased recreational access to the SPA / Ramsar.

6.17 While the wider area around the RNLI site does not provide continuous direct access to the SPA / Ramsar, it is noted that access to the water is unrestricted in many places, typically consisting of pebble beach habitat. Furthermore, on a previous visit to the site it was noted that people used a slipway near the RNLI site to launch their jet-skis into the SPA / Ramsar site. While it is therefore recognised that the redevelopment of the RNLI site might lead to increased recreational footfall near Eastney Point, it is thought that delivering a café with an integrated ecology centre might absorb some of the visitors that might otherwise wander around the SPA / Ramsar. Furthermore, given that access to the SPA / Ramsar is already possible, it is considered that an ecology information centre might be useful in educating visitors on bird interest features and delivering Codes of Conduct for recreational activities.

6.18 **It is recommended that the conversion of the RNLI site into a café is coupled to the mandatory delivery of an ecological information centre, to help mitigate the impacts of recreational pressure. Furthermore, the delivery of the café would need to be accompanied by its own project-level HRA to ensure that there are no adverse effects on the integrity of European Sites. A similar project-level HRA should be required for any development adjacent to European Sites, which might increase recreational footfall in the designated site.**

Proposals increasing the net residential population

6.19 The following proposal in Old Portsmouth opportunity area has the potential to increase the net residential population in the wider 5.6km catchment zone of nearby European Sites:

- **Development of mixed-use scheme with residential development, restaurants and cafes**

6.20 The following proposals in different opportunity areas have the potential to increase the net residential population with immediate access to nearby European Sites:

Henderson Road to Eastney Point (immediately adjacent to the Chichester and Langstone Harbours SPA / Ramsar)

- **Provision of holiday-let accommodation at the Southsea Marina**
- **Conversion to residential use of Southsea Leisure Park**
- **Enhanced provision of watersports facilities adjacent to Southsea Leisure Park**

St. George's Road to Henderson Road (within a short walk of the Chichester and Langstone Harbours SPA / Ramsar)

- **Conversion of museum to a hotel with ancillary residential use**

Southsea Common Opportunity Area (relatively distant to both Portsmouth Harbour SPA / Ramsar and the Chichester and Langstone Harbours SPA / Ramsar)

- **Provision of hotel / spa at the Pyramids Centre site**

6.21 The provision of holiday -let accommodation and hotels would effectively represent net new residential growth in the area, while the conversion from touring / static caravans to residential use in the Southsea Leisure Park is likely to mean that there would be more permanent residents. In combination with the enhanced provision for watersports facilities at Southsea Leisure Park, this is likely to mean that more recreational use will occur in the SPA / Ramsar and / or Eastney Beach, which contains Primary Support Areas for waders (P78, P142).

Furthermore, on a previous visit to this site, it was observed that visitors are already using this section of coast for activities on water, including jet-skiing.

Holiday-let accommodation

6.22 Generally, the holiday-let accommodation in Southsea Marina is more likely to be used in the summer months. For example, a survey of beach hut users on the Portsmouth seafront found that a third of owners did not use their beach huts at all during the winter. However, two thirds used their huts daily, weekly or monthly all year round. Furthermore, 20% of survey participants indicated that they visit with their dog.

6.23 It is concluded that the provision of holiday-let accommodation at Southsea Marina and a linked increase in recreational pressure might lead to adverse effects on the integrity of the Chichester and Langstone Harbours SPA / Ramsar. **It is therefore recommended to impose seasonal restrictions on the rental of such accommodation**. Limiting the letting to the spring / summer would mean that most visitors are accommodated, while ensuring that the SPA / Ramsar is extended adequate protection. This is due to the site being most sensitive in winter, with most qualifying species being passage or overwintering migrants.

Provision of residential use and hotels

6.24 A proposal for mixed-use development with residential dwellings, food, beverage and artist studios in Old Portsmouth (Former Wightlink site, Fish Market) is contained in the Seafront Masterplan. The closest brent geese supporting habitats are two areas of Low Use (P100 – 587m away, P35 – 473m away) and Southsea

Common (P35 – 750m away, a Core Area), while both the Portsmouth Harbour SPA / Ramsar and the Chichester and Langstone Harbours SPA / Ramsar are further away. Given that both the Portsmouth Harbour SPA / Ramsar and P100 to the north are in highly urbanised settings and difficult to access, it is expected that most of the recreational pressure from these proposals would focus on the section of coast to the south-east, i.e. towards Southsea Common, Eastney Beach and the Chichester and Langstone Harbours SPA / Ramsar.

6.25 Regarding Eastney Beach, the Seafront Masterplan identifies that '*Much of Eastney Beach is vegetated shingle, which is considered to be a special habitat, where conditions are stable enough for specially adapted plants to grow*.' It also details that '*any development that would have a negative impact on the special characteristics of this area should be refused planning permission*.' It concludes that '*development opportunities in this area are considered to be limited…. This area should remain free of development.*' While these paragraphs acknowledge the ecological importance of this area, the Masterplan proposes residential development here, which is discussed in the following.

6.26 The Seafront Masterplan provides for several hotels and permanent residential use near Eastney Beach, including several hotels (i.e. the Pyramid site and the vacant Royal Marines Museum) and the conversion of the Southsea Leisure Park from static caravans to residential-led redevelopment. Southsea Leisure Park is located directly adjacent to two Primary Support Areas for waders (P78, P142) and is only 650m from supporting habitat for brent geese. The Primary Support Areas P78 and P142 function as roost sites for a several species of wading birds, including redshank, dunlin and oystercatcher. This would result in a permanent increase in the local residential population, which needs to be considered in-combination with residential growth provided for in Local Plans of the various adjacent authorities. In contrast to the holiday-let accommodation at Southsea Marina, such development clearly cannot be mitigated through seasonal letting restrictions.

6.27 The provision of hotels and residential use needs to be further set into the context of the plan for a continued support of water sports usage at Eastney Swimming Pool, which is likely to increase the amount of water-based recreation around Eastney Beach. This is particularly significant for some of the species of wading birds, as these were found to be particularly sensitive to disturbance. While roughly only 10% of brent geese actively responded to disturbance events, this proportion was much higher for redshank (20%), dunlin (19%) and oystercatcher (25%). Notably, wading birds are not equally disturbed by different types of recreational activities. Fieldwork for the Bird Aware Solent strategy also showed that only 12% of terrestrial activity caused disturbance to birds in the intertidal zone, while disturbance resulted from 25% of water-based activities[68]. As such, the residential growth in combination with the provision of facilities for water sports have the potential to cause significant disturbance to SPA / Ramsar birds.

6.28 However, issues relating to the watersports hub at Eastney Swimming Pool were already discussed in the HRA screening document of the previous version of the Portsmouth Seafront Masterplan. It was determined that *the presence of a dedicated facility for watersports, with dedicated access in this location will draw watersports users out of the harbour to the area close to the hub. The presence of dedicated watersports facilities is also one of the mitigation measures which is likely to be taken forward in the Solent Disturbance and Mitigation Project.* It was also noted that the planned boardwalk will concentrate the additional recreational use in a predictable area and help guide recreational traffic away from sensitive features. The HRA therefore concluded that the watersports hub would protect the Chichester and Langstone Harbours SPA / Ramsar by concentrating water-based recreation around Eastney Beach away from the SPA / Ramsar. However, this would also bring watersports users closer to the wader support areas P78 and P142.

6.29 A previous HRA on an earlier version of the Masterplan document discussed mitigation options in relation to recreational pressure because of beach hut provision at Eastney Beach. In relation to the potential loss of P78 as a Primary Support Area, it recommended that '*potential avoidance / mitigation measures could include (but may not be limited to):*

- *Prohibiting dogs not on a lead on this part of Eastney beach during the winter (this is already the case during the summer)*
- *Providing information to new beach hut tenants about the biodiversity of Eastney Beach and how they can help to preserve this special area, and/or*

[68] Liley D., Stillman R. & Fearnley H. (2010). The Solent Disturbance and Mitigation Project Phase 2: Results of Bird Disturbance Fieldwork 2009/10. Footprint Ecology Report for the Solent Forum. 71 pp.

- *Requiring new beach hut tenants to sign up to a 'code of conduct' setting out expectations of the way in which they should use the area and respect its particular sensitivities*'

These mitigation recommendations are relevant to all development proposals near Eastney Beach and can continue to be relied upon.

In-combination assessment of recreational pressure

6.30 The impact pathway recreational pressure was previously assessed in the HRA for the Portsmouth Local Plan in-combination with the plans of surrounding authorities. The HRA identified that the Solent is a destination receiving approx. 52 million recreational visits from households per year. It also determined that there would not be adverse effects on the integrity of the Portsmouth Harbour SPA / Ramsar and the Chichester and Langstone Harbours SPA / Ramsar, given that measures were taken to mitigate recreational pressure in the Solent.

6.31 The Bird Aware Solent Recreation Mitigation Strategy[69] (2017) stipulates that all net new residential development within a 5.6km catchment zone will result in Likely Significant Effects on coastal SPAs / Ramsars. The catchment boundary was based on the distance where the majority (i.e. 75%) of coastal visitors live. It was therefore decided that mitigation measures and monitoring delivered as part of Bird Aware Solent are to be funded by developer contributions of between £346 and £902[70] (depending on the number of bedrooms delivered) per net new residential dwelling delivered within the 5.6km catchment zone.

6.32 The Bird Aware Solent Strategy proposes the following mitigation and monitoring measures to reduce the impact of recreational pressure:

- A team of 5-7 coastal rangers working to reduce disturbance
- Initiatives to encourage responsible dog walking in less sensitive parts of the coast
- Preparation of Codes of Conduct for high-impact recreational activities
- Tailored habitat management projects for specific sites
- A monitoring schemes to track the effectiveness of mitigation measures
- Providing alternative recreational greenspace (e.g. the Alver Valley Pilot Project)

6.33 To avoid adverse effects on the site integrity of the Portsmouth Harbour SPA / Ramsar and the Chichester and Langstone Harbours SPA / Ramsar, **it is recommended that all development (including hotels) resulting in the growth of the residential population in the Portsmouth Seafront, is to provide a financial contribution to the Bird Aware Solent project at the rate of £564 per net additional dwelling. Furthermore, it is recommended that seasonal restrictions are to be imposed on the letting of accommodation at Southsea Marina, to avoid adverse effects on overwintering SPA / Ramsar birds. Given the implementation of the above, it is concluded that there will be no adverse effects on the integrity of European Sites due to the Portsmouth Seafront Masterplan regarding the impact pathway recreational pressure.**

Impacts of Tall Buildings on Flight Lines and Sight Lines

6.34 Recent decades have seen advances in the scientific understanding of the effects of manmade structures on birds. Any building has the potential to result in bird mortality due to direct collisions. Furthermore, tall buildings are also known to influence the behaviour of birds, potentially resulting in significant energetic costs. Therefore, the construction of tall buildings near European sites or functionally linked land might have detrimental effects on qualifying bird species.

6.35 The Portsmouth Seafront Masterplan details the construction of various buildings, such as a hotel / spa, hovercraft ferry terminal and a variety of further buildings for leisure use (e.g. restaurants, bars, cafes). While currently there is little detail on the construction specifications of these buildings available, some of

[69] Available at: http://www.birdaware.org/strategy [Accessed 16/07/2019]
[70] As of 01/04/2019 refined from the original £564 per additional residential dwelling. https://www.portsmouth.gov.uk/ext/development-and-planning/planning-policy/solent-special-protection-areas [Accessed 29/07/2019]

the larger construction proposals are discussed in the following and mitigation measures are proposed where relevant.

Clarence Pier

6.36 The extensive redevelopment planned for Clarence Pier could include a mix of buildings for various leisure uses (e.g. restaurants, bars), a hotel and a new hovercraft terminal. While Clarence Pier clearly already supports large structures, the current proposal introduces the possibility of further tall buildings to be added to the pier's landscape.

6.37 New buildings have the potential to affect how effectively brent geese use Southsea Common as a foraging habitat. A comprehensive overview of the structural attributes that determine the impact of tall structures on birds is provided in a literature review[71]. This paper indicates that the impact on birds is primarily determined by structural dimensions (e.g. height), lighting and proximity to areas of high use. Tall structures are also known to change the behaviour of migrant birds such as Bewick swans. For example, construction of a wind farm in the Netherlands resulted in avoidance behaviour in Bewick swans, but also increased the risk of mortality[72].

6.38 The Masterplan outlines the provision of a hotel. From the current proposal it is not yet clear whether this will be a tall structure. However, many hotels tend to have continuous lighting in place and much of the literature highlights the negative impacts of lighting, for example through entrapment effects[73]. The construction of this hotel therefore might have negative effects on how well brent geese can use Southsea Common.

6.39 As noted in the 2012 HRA, the issue is still not well understood in a local context because little research has been conducted on the commuting routes of wintering brent geese. The HRA highlights that this '*is likely to be both highly spatially specific and weather dependent, and to be affected by the relative location of bird roosts, foraging habitats and proposed new development*'. Consequently, there is still a lack of knowledge in this research area and the precautionary principle therefore needs to be employed.

6.40 The location of Clarence Pier including the proposed hotel is south of Southsea Common. The brent geese that use the common are likely to originate from the Portsmouth Harbour SPA / Ramsar 1.5km to the west. **It is therefore considered unlikely that brent geese flight paths would be obstructed by new buildings at Clarence Pier and this proposal will not result in adverse effects.** Furthermore, Clarence Pier already contains several tall buildings, which have not reduced the geese's ability to feed on Southsea Common.

6.41 While the delivery of a tall building in Clarence Pier is unlikely to affect the brent geese on Southsea Common, it is noted that the Seafront Masterplan contains protective wording regarding the impact of tall buildings on Clarence Pier. Page 55 details that: '*If a tall building is proposed, key design considerations would include the settings of heritage assets, but also bird strike, both in general and in the context of the Special Protection Area.*' **The implementation of this wording means that there would be no adverse effects on flightlines of SPA birds flying to or from Southsea Common, which is functionally linked land to the Portsmouth Harbour SPA / Ramsar.**

Southsea Common Opportunity Area

Redevelopment of the Blue Reef Aquarium

6.42 The Masterplan includes an option for redeveloping the Blue Reef Aquarium and further to provide a new building / attraction to the west of the aquarium in chapter 5.4.1 (Southsea Castle to Palmerston Road). While the proposal does not contain detail to what specification (e.g. building height) these buildings would be delivered, it is possible that additional tall infrastructure will be added here.

6.43 The Blue Reef Aquarium site lies south of Southsea Common (P35) an it is therefore unlikely that new developments would obstruct the flight paths of brent geese arriving from the Portsmouth Harbour SPA / Ramsar. Any of the supporting areas to the east of the aquarium site are more likely to provide refuge for

[71] Drewitt A.L. & Langston R.H.W. (2008). Collision effects of wind-power generators and other obstacles on birds. Annals of the New York Academy of Sciences 1134: 233-266.
[72] Fijn R.C., Krijgsveld K.L., Tijsen W., Prinsen H.A.M. & Dirksen S. (2012). Habitat use, disturbance and collision risks for Bewick's Swans *Cygnus columbianus bewickii* wintering near a wind farm in the Netherlands. Wildfowl 62: 97-116.
[73] Gauthreaux S.A. & belser C.G. (2006). Effects of artificial night lighting on migrating birds. In *Ecological Consequences of Artificial Night Lighting.* C. Rich & T. Longcore, Eds.: 67-93. Island Press, Washington DC.

birds from the Chichester and Langstone Harbours SPA / Ramsar, which would also be unlikely to be affected by development at the Blue Reef Aquarium site. **Therefore, the Blue Reef redevelopment will not result in adverse effects on flightlines of SPA birds, such as brent geese.**

Redevelopment of the Pyramids site

6.44 A hotel / spa at the Pyramids site is included in the proposal for this development area in chapter 5.4.3 (the Pyramids Centre). This development area is adjacent to a classification candidate (P34) and a Secondary Support Area (P115) for brent geese. The Solent Waders and Brent Goose Strategy identified that buildings within a 50-500m zone from brent geese habitat is likely to make a site less suitable for them.

6.45 Another potential issue with the Pyramids site is that it lies between these support areas to the west and the Chichester and Langstone Harbours SPA / Ramsar to the east. Therefore, it is possible that any tall building within this corridor might impact on the flightlines of brent geese, and therefore their ability to use the P34 and P115 sites.

6.46 In relation to development work (e.g. buildings) the 2012 Seafront Masterplan HRA recommends that buildings should not '*reduce the effectiveness of the Common as a feeding site as a result of, for example, the design of buildings, overshadowing or light pollution. Developers should discuss this matter at an early stage with the city council's ecologist and Natural England*'. This mitigation measure is upheld and should be considered, especially in relation to the plan for a hotel at the Pyramids site. **It is further recommended to limit the height of buildings delivered in this opportunity area to minimise any potential impact on goose flightlines**.

6.47 On page 64, the Seafront Masterplan contains the following wording regarding building specifications at the Pyramids site: '*Overall building height, mass, volume, scale, and layout should be guided by how these design elements would have an impact on the setting of Southsea Castle and the conservation area, as well as the wider townscape and landscape.*' **It is recommended that this section should make specific reference to building designs that aim at reducing bird strikes (similar to Clarence Pier)**.

Visual and noise disturbance from construction

6.48 Most development proposals in the Portsmouth Seafront Masterplan detail the provision of buildings that are likely to involve a construction process. Construction will inevitably be accompanied by noise and / or visual disturbance. Overall, the potential impact of building construction on birds is likely to depend on: (a) the scale of the construction works, (b) the distance to areas where the birds reside and (c) the relative susceptibility of different bird species.

6.49 The building proposals contained within the Masterplan that are most likely to result in noise and visual disturbance of SPA / Ramsar bird species are:

- **Redevelopment of Clarence Pier to provide for a hotel, restaurants and other uses**
- **Redevelopment of the Blue Reef Aquarium to provide a building with a larger footprint**
- **Provision of a hotel / spa at the Pyramids site**
- **Redevelopment of Eastney Swimming Pool and Southsea Leisure Park**
- **Provision of holiday-let accommodation at Southsea Marina**

6.50 There is now abundant research in the literature highlighting the impacts of construction processes on ecological interest features. A study conducted by the British Trust for Ornithology highlighted that different types of construction work, and up to several hundred metres away, reduced the densities of five waterfowl species, including Eurasian teal, Eurasian oystercatcher, dunlin, Eurasian curlew and common redshank[74]. A more recent study found that construction works of wind farms had greater impacts on bird populations than subsequent operation[75]. Therefore, any construction work carried out as part of the Seafront Masterplan has the potential for resulting in bird disturbance.

[74]Burton N.H.K., Rehfisch M.M & Clark N.A. (2002). Impacts of disturbance from construction work on the densities and feeding behaviour of waterbirds using the intertidal mudflats of Cardiff Bay, UK. Environmental Management 30: 865-871.
[75] Pearce-Higgins J.W., Stephen L., Douse A. & Langston R.H.W. (2012). Greater impacts of wind farms on bird populations during construction than subsequent operation: Results of a multi-site and multi-species analysis. Journal of Applied Ecology 2012: 386-394.

6.51 Recent research on noise and visual disturbance from construction activities, has indicated that noise disturbance from construction should be limited to below 70 dB as waterfowl are able to habituate to such noise levels[76]. Furthermore, the noise from the most disturbing construction works, such as impact piling, recedes to below disturbing levels approx. 100m from the source. However, despite this general noise threshold, specific regard should be given to the sensitivity of individual species. For example, redshank and brent geese, both qualifying species of SPA / Ramsar sites in the area of the Seafront Masterplan, are highly sensitive to noise disturbance and caution is advised for noise levels above 55 dB.

6.52 The effects of visual disturbance differ between species and also vary with the activity undertaken by the bird. For example, redshank first react to visual disturbance at 250m distance to the stimuli, while brent geese react to such stimuli only at approx. 105m distance when feeding. However, when roosting the tolerance of brent geese decreases and they react to stimuli up to 205m in distance. Overall, the evidence base highlights that the qualifying species of both the Portsmouth Harbour SPA / Ramsar, and the Chichester and Langstone Harbours SPA / Ramsar are vulnerable to the effects of visual and noise disturbance.

All Development involving Construction

6.53 A possible measure identified in the previous HRA to mitigate the effects of noise and visual disturbance of construction work was to provide screening. This would shield the birds' sightlines from construction activity and would buffer some of the noise emitted from construction. However, it was also noted that some potential residual negative impact of noise and / or visual disturbance would remain.

6.54 The 2012 screening statement of the Portsmouth Seafront Masterplan makes the following recommendation regarding the provision of beach huts at Eastney Beach: '*to the important winter roost site for wading birds and therefore construction of the huts will need to take place outside of the November – February period*'. By avoiding this sensitive period for the waders, the HRA provided an adequate mitigation measure specifically regarding the provision of beach huts at Eastney Beach.

6.55 **It is recommended that this mitigation measure is extended to all of the proposals detailed in section 6.44**. Due to the seasonal residency patterns of most qualifying species in the relevant European sites, avoiding any major construction work in the November – February period implies that there will be no adverse effects on qualifying bird species.

6.56 Furthermore, it is advised that construction work should not be permitted within 100m from known roost sites or feeding areas of SPA / Ramsar birds to avoid negative impacts of visual and noise disturbance. For designated sites or functionally linked land parcels (e.g. P78) that contain particularly sensitive species such as redshank, no construction works should be permitted within 200m. If construction work within such precautionary zones cannot be avoided, it is recommended that screening is provided to reduce visual and noise disturbance.

Atmospheric Pollution

6.57 The Seafront Masterplan outlines development that is likely to increase the overall recreational use and the level of employment in the seafront area. In turn, this is likely to lead to more car journeys being undertaken in the vicinity of European sites. However, the impact pathway atmospheric pollution is not usually considered at this level of a plan. Instead, atmospheric pollution is generally considered at a higher tier in-combination with plans of surrounding authorities. By definition this then includes any development at a lower tier of plan, such as this Seafront Masterplan and individual projects.

6.58 The 2011 Portsmouth Core Strategy HRA undertook air quality modelling that considered housing, employment and retail allocations in the authorities of Portsmouth, Fareham, Gosport and Havant. The modelling also accounted for development in the North of Fareham Strategic Development Area (SDA), the Whitely major development, the West of Waterlooville major development area and the North Hedge End SDA.

6.59 The HRA concluded that the Core Strategy policies would not have adverse effects on the integrity of the Chichester and Langstone Harbours SPA / Ramsar, the Solent and Southampton Water SPA / Ramsar, the Solent Maritime SAC, and the Solent and Isle of Wight Lagoons SAC. However, it determined that measures were necessary to avoid / mitigate adverse effects on the Portsmouth Harbour SPA / Ramsar. The HRA

[76] http://bailey.persona-pi.com/Public-Inquiries/M4%20-%20Revised/11.3.67.pdf [Accessed 10/07/2019]

concluded that, subject to the successful incorporation of these measures into the Core Strategy, there would be no adverse effects on the Portsmouth SPA / Ramsar.

6.60 In the Seafront Masterplan this mitigation is reflected. For example, the measure 'Improving walking and cycling opportunities' is incorporated into the development proposal in the Avenue de Caen to Southsea Castle area. The proposal aims at creating an attractive environment for pedestrians to build a stronger link between Southsea town centre and the seafront. Furthermore, there are also plans for promoting a modal shift in transport in the Canoe Lake & Eastney Beach area. The proposal here intends to narrow the carriageways and to provide for a dual-direction cycling route.

6.61 The air quality modelling work undertaken for the adopted Core Strategy is being revised for the emerging Portsmouth Local Plan and its HRA, as this is an issue associated with growth across Portsmouth and the Solent rather than specifically with redevelopment of Southsea seafront. That work is at an early stage of development. However, Havant Council have commissioned air quality and ecology analytical work (alone and in combination with growth in Portsmouth and further afield). That work confirms that most features for which Solent Maritime SAC is designated have low susceptibility to atmospheric nitrogen deposition. The most widespread interest feature that has some air quality vulnerability is saltmarsh.

6.62 For saltmarsh, the UK Air Pollution Information System provides a Critical Load range of 20-30 kg/N/ha/yr and nitrogen inputs have been experimentally demonstrated to have an effect on overall species composition of saltmarsh. However, the Critical Loads on APIS are relatively generic for each habitat type and cover a wide deposition rate range. They do not (and are not intended to) take into consideration other influences to which the habitat on a specific given site may be exposed. Moreover, it is important to note that the experimental studies which underlie conclusions regarding the sensitivity of saltmarsh to nitrogen deposition have '… *neither used very realistic N doses nor input methods i.e. they have relied on a single large application more representative of agricultural discharge*'[77], which is far in excess of anything that would be deposited from atmosphere. This is why APIS indicates that determining which part of the critical load range to use for saltmarsh requires expert judgment; there is good reason to believe the upper part of the critical load range (30 kgN/ha/yr) may be more appropriate than the lower part (20 kgN/ha/yr).

6.63 Moreover, AECOM has had cause to consider atmospheric nitrogen inputs to intertidal/estuarine habitats on the south coast of England in discussion with Natural England officers in that area and together we have concluded that for these particular sites, nitrogen inputs from air are not as important as nitrogen effects from other sources because the effect of any deposition of nitrogen from atmosphere is likely to be dominated by much greater inputs from marine or agricultural sources. This is reflected on APIS itself, which states regarding saltmarsh that '*Overall, N deposition* [from atmosphere] *is likely to be of low importance for these systems as the inputs are probably significantly below the large nutrient loadings from river and tidal inputs*'[78]. Moreover, the nature of intertidal saltmarsh in the Solent estuaries means that there is flushing from tidal incursion on a daily basis. This is likely to further reduce the role of nitrogen from atmosphere in controlling botanical composition.

6.64 The work undertaken by Havant Council identifies that the most nitrogen-sensitive habitat for which the Solent Maritime SAC is designated are small patches of 'perennial vegetation of stony banks' in the northern parts of Langstone Harbour. Due to their location, roads within 200m of these areas are unlikely to be key journey to work routes for Portsmouth residents and are likely to be little affected by traffic growth in Portsmouth City and particularly the Seafront.

Water Quality

6.65 The Seafront Masterplan provides for new residential and employment development (including several hotels, residential use and leisure facilities). The residential uses are likely to account for the bulk of additional wastewater production, but employment allocations are also likely to contribute to the increased sewage effluent produced. This has the potential to lead to adverse effects on the integrity of European Sites that depend on water quality.

6.66 Like atmospheric pollution, water quality is an impact pathway that needs to be considered at an overarching Plan level. As such the HRA process is often informed by water cycle studies that are undertaken at a broad strategic level. A water cycle study typically places the water quality status of aquatic systems into the context of broad-scale development and existing waste water processing capacity. The results are then

[77] UK Air Pollution Information System website [accessed 21/04/15]: http://www.apis.ac.uk/node/968
[78] APIS website [accessed 21/04/15]: http://www.apis.ac.uk/node/968

used to help determine whether the development will result in adverse effects on the integrity of European Sites.

6.67 The 2011 Portsmouth Core Strategy HRA concluded that there would be no adverse effects from waste water as a result of the Portsmouth Core Strategy. Relying on research carried out at the sub-regional level on behalf of PUSH (Atkins, 2009), it concluded that it was '*very unlikely that major new wastewater treatment infrastructure will be required during the next 20 years other than that already required to achieve the consents set by the Environment Agency under the Urban Wastewater Treatment Directive*'. Therefore, the Seafront Masterplan, effectively specifying a small portion of the development set out in the Portsmouth Local Plan, will not result in adverse effects on any European Site.

6.68 Since that time, the Partnership for Urban South Hampshire (PUSH), Natural England (NE) and Environment Agency (EA) have devised an Integrated Water Management Study[79] (IWMS) with the aim of assessing the region's potential to accommodate future housing growth without detrimental effects on water quality and resources.

6.69 The IWMS identifies existing mechanisms to reduce nitrogen input into rivers and coastal waterbodies. Defra's Catchment Sensitive Farming programme seeks to reduce diffuse agricultural pollution from fertiliser and slurry run-off, and both Portsmouth Water and Southern Water are undertaking upgrades to their wastewater treatment works to reduce nitrogen inputs from human sewage. The IWMS highlights the need for physical upgrades to seven Wastewater Treatment Works (WwTWs) and six sewer networks to accommodate current and future increases in sewage volume. However, it is understood that a net nutrient offsetting strategy is being explored and the status of that strategy will need to be taken into account when granting consent for any net new development in the Seafront area or Portsmouth more widely.

[79]PUSH. (2018) Integrated Water Management Study. Final Amended Report 07/03/2018. Amec Foster Wheeler Environment and Infrastructure UK Limited.

7. Conclusions and Recommendations

7.1 In summary, the HRA of the updated Portsmouth Seafront Masterplan assesses new and revised development proposals that have emerged since the adoption of the previous Masterplan in 2013. The following impact pathways were considered to be relevant in this assessment:

- Recreational pressure (on the SPAs / Ramsars and functionally linked land)
- Impact of tall buildings on bird flightlines and sightlines
- Visual and noise disturbance (during and post construction)
- Atmospheric pollution
- Water quality

7.2 Several development proposals were found to potentially result in adverse effects on European Sites, particularly the Portsmouth Harbour SPA / Ramsar and the Chichester and Langstone Harbours SPA / Ramsar, and therefore require mitigation.

7.3 The proposed conversion of the RNLI site to a café is likely to lead to increased recreational footfall immediately adjacent to the Chichester and Langstone Harbours SPA / Ramsar. **It is advised that delivery of the café is coupled to the mandatory delivery of an ecological information centre, to help mitigate the impacts of recreational pressure. Furthermore, the proposal for the café would need to be accompanied by its own project-level HRA to ensure that there are no adverse effects on the integrity of European Sites. A similar project-level HRA should be required for any development adjacent to European Sites, which might increase recreational footfall in the designated site.**

7.4 Regarding the impact pathway recreational pressure, the provision of holiday-let accommodation at Southsea Marina is likely to significantly increase recreational pressure in the Chichester and Langston Harbours SPA / Ramsar. **It is therefore recommended to impose seasonal restrictions on the rental of such accommodation to avoid adverse effects on waterfowl. Rental should therefore not be permitted between October and March to avoid recreational disturbance of overwintering waterfowl.**

7.5 Several development proposals, namely the hotel / spa at the Pyramids site, the hotel at the vacant Royal Marines Museum and residential-led redevelopment of Southsea Leisure Park would result in the net growth of the residential populations within 5.6km of the coastal SPAs / Ramsars and as such could lead to adverse effects on site integrity through the impact pathway recreational pressure. In accordance with the Bird Aware Solent strategy, **it is therefore recommended that all development (including hotels) resulting in the growth of the residential population within 5.6km of the Portsmouth Harbour SPA / Ramsar and the Chichester and Langstone Harbours SPA / Ramsar, is to provide a financial contribution to the Bird Aware Solent project at the rate of between £346 and £902 (dependent on the number of bedrooms to be delivered) per net additional dwelling, and charges for hotel development calculated on a case-by-case basis. Furthermore, the recommendations from a previous HRA regarding recreational pressure on Eastney Beach, specifically Code of Conduct rules, dog-on-lead policies and ecological information boards, should continue to be implemented.**

7.6 While more detail on the construction details of individual buildings are needed, this HRA discussed the ecological impacts of potentially tall buildings to be delivered as part of the Seafront Masterplan. It is concluded that the provision of such buildings in most opportunity areas would not result in adverse effects on site integrity. However, the hotel / spa proposed at the Pyramids site might result in adverse effects on the ability of brent geese to use the secondary support areas (P34 and P115). **In addition to consulting a Natural England ecologist in the early stages of development, it is recommended to limit the height of this building to minimise its impact on the behaviour of brent geese.**

7.7 All construction work is inevitably accompanied by the presence of workers, machinery and the noise emitted by such works, and for several proposals works would be undertaken close to European Sites and / or functionally linked land. **It is generally recommended that any construction work is carried out outside the core season for overwintering waterfowl, avoiding the November-February period. Where this is not possible, it is recommended that major construction work is not to be carried out within 100m of known roost sides or feeding areas of SPA / Ramsar birds. If particularly sensitive species are present (e.g. redshank) it is recommended that a precautionary distance of 200m is**

used. Construction works that need to be carried out within these distances should ensure that appropriate screening is in place to minimise visual and / or noise disturbance.

7.8 It was further determined that the Portsmouth Seafront Masterplan document would not result in adverse effects on European sites regarding the impact pathways atmospheric pollution and water quality. These impact pathways were investigated at the level of the Portsmouth Local Plan and it was determined that they would not result in adverse effects on any European Site. Mitigation and / or avoidance measures are therefore not required in relation to these impact pathways.