YACHTHAVEN, HAYLING ISLAND

ENVIRONMENTAL STATEMENT

DECEMBER 2011

APPENDIX 3.2

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YACHTHAVEN, HAYLING ISLAND

REVISED ECOLOGICAL ASSESSMENT

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YACHTHAVEN, HAYLING ISLAND

REVISED ECOLOGICAL ASSESSMENT

EXECUTIVE SUMMARY

This document presents an assessment of the likely ecological effects of a proposed development at Yachthaven, Hayling Island, Hampshire comprising six residential dwellings with associated landscaping and infrastructure and a 12-berth pontoon; the proposals also include the creation and subsequent management of a nature reserve. The site is located adjacent to several designated conservation sites including the Solent Maritime SAC, Chichester and Langstone Harbours SPA and Ramsar Site, Chichester Harbour SSSI and other non-statutory nature conservation sites (SINCs). These are primarily designated for their important coastal habitats such as saltmarsh and eelgrass beds and internationally important overwintering bird populations, particularly brent geese.

The development site itself comprises of a former boatyard, including a species-rich hedgerow, with the wider application site including an area designated as a SINC for its unimproved grassland and use by feeding and roosting brent geese. The site is located in the shore of a creek in Chichester Harbour adjacent to intertidal mudflats and eelgrass beds and close to important brent goose and wader roosting sites at Verner Common and Gutner Peninsula. Existing data and newly undertaken bird surveys of the creek (including tidal cycle counts and high tide roost counts) suggest that the creek is used by a relatively small proportion of the birds using Chichester Harbour as a whole. Areas close to the development site were used least, with numbers and variety of birds increasing towards the mouth of the creek. Other than the previously identified important roost sites, no other significant high-tide roosting or feeding areas were found close to the development. Low numbers of slow worms and viviparous lizards were also recorded on the site.

The proposals were identified as having the potential to cause minimal disturbance of the important high tide roosts at Verner Common and Gutner Peninsula due to increased boat traffic, which would affect the conservation status of the SPA, and also disturbance of birds feeding in the intertidal zone and on grassland adjacent to the site during construction and due to an increased human presence in the area. The proposals also have the potential to damage the species-rich hedgerow during construction. They will also cause the loss of an area of reptile habitat and risk the killing or injuring of reptiles.

In order to prevent any impacts upon the SPA and other features of ecological interest, a number of avoidance and mitigation measures are proposed. These include the removal of existing sea defences and disused pontoons to offset any loss of intertidal habitat and mitigate for coastal squeeze, timing of construction works likely to cause the most disturbance to coincide with the period of lowest bird use of the creek to prevent disturbance during construction. In order to prevent disturbance of birds at high tide roosts, clauses restricting boat movements during the

winter, and mooring anywhere by the pontoon will be added to the rental/ purchase agreement for the berths. Signage will also be erected to prevent illegal landing at important bird areas; inland brent goose feeding areas will be screened from the site by existing retention of hedgerows. The pontoon will not directly impact any eelgrass, neither will moored boats. An Eelgrass Code of Conduct for boat users will be introduced. The hedgerow will be protected using standard arboricultural tree protection measures. Impacts to reptiles on the site will be mitigated by capturing reptiles from within the development footprint and relocating to newly created habitat outside of the construction zone.

The proposals also include a number of environmental improvements such as the removal of existing sea defences which will endure the amount of hard shoreline along the creek will not increase and the project will be neutral in terms of coastal squeeze; contaminated spoil and other waste will also be removed from the intertidal zone.

A nature reserve of two areas, 'Yachthaven Coastal Meadow and Wetland' and 'Yachthaven Coastal Grassland' will be created. There will also be extensive scrub removal to enhance the quality of the grassland within the site and improve the habitat for reptiles and have potential to improve grassland diversity. This area will also act as a buffer for future coastal squeeze in the event of rising sea levels. An area of species-rich coastal grassland will be created in a currently low-value, scrub-covered part of the site. This will provide high quality habitat for reptiles and invertebrates.

It is concluded that if the proposed avoidance and mitigation measures are implemented in full, the proposed development would not have any significant ecological impacts and therefore would fully comply with the relevant planning policy and nature conservation legislation.

1.0 INTRODUCTION

1.1 Background

This document presents details of any likely ecological effects resulting from a proposed development at a derelict boatyard in Hayling Island, Hampshire (see **Map 1** for the site location). It has been produced for and on behalf of Yachthaven (Hayling) Ltd. in order to ensure the project fully complies with nature conservation legislation and policy (where applicable). The document contains a description of the ecological baseline of the site, outlines any potential ecological effects of the proposals and presents opportunities for mitigation and/or ecological enhancements. Due to the proximity of the application site to a number of statutory designated nature conservation areas, this document also provides sufficient information to allow the Local Authority to undertake an 'Appropriate Assessment' under the Habitats Regulations, of likely effects of the development on the designated site, should one be required.

A Planning Application for the site was made in November 2011, which Havant Borough Council were not prepared to permit. The project proposals have been significantly modified in order to address some of the points raised in response to the original application. Therefore, this report updates and supersedes the Ecological Assessment submitted with the initial application (dated November 2011). This report includes data presented within previous ecological reports (1, 2), the original Ecological Assessment and previously unreported data, and outlines amended project proposals and revised impact avoidance and mitigation measures.

1.2 Site Context

The site currently comprises a disused boatyard (located at SU728017, see **Map 1**) located on the eastern side of Hayling Island, and also includes a parcel of land to the west of the development site within a non-statutory designated Site of Importance for Nature Conservation (SINC), known as 'Fields & Saltmarsh South of Copse Lane'. This contains coastal grassland habitats with associated trees and hedgerows. This, together with the adjacent intertidal areas are within the land ownership of the developer and are therefore being considered as part of the project, particularly in view of the their potential to be managed for ecological enhancement and mitigation.

The site is located directly adjacent to statutory designated sites including Chichester and Langstone Harbours Special Protected Area (SPA); Solent Maritime Special Area of Conservation (SAC); Chichester and Langstone Harbours Ramsar Site and Chichester Harbour Site of Special Scientific Interest (SSSI). The site also falls within the Chichester Harbour Area of Outstanding Natural Beauty (AONB).

1.3 Summary of the Proposals

Following a recent application in November 2011, the proposals have been modified in order to further avoid potential ecological impacts, including the removal of the previously proposed yacht brokerage. The proposed works now include the following aspects:

- Construction of a floating pontoon to accommodate twelve (reduced from 19 in the original proposals) sailing boats (generally 10m long by 4 m wide) with no multi hulled craft requiring to be moored. The Pontoon will be held in position by 4 driven piles, either timber or steel.
- A boat store and associated office and wash room facilities for on site and off site pontoon owners/lease holders will be located on the existing hard standing areas
- A new concrete slipway will be constructed over the existing slipway.
- Existing sea defences (concrete piles) and disused pontoons will be removed
- Construction of six detached dwellings covering an area of approximately 0.1ha on the site of derelict buildings of the former boatyard
- Public footpath reinstated with inert materials
- Areas of green space either side of the development are to be landscaped where necessary and managed as a Nature Reserve: Yachthaven Coastal Meadow & Wetland (part of the existing SINC) to the west and Yachthaven Conservation Grassland east of the hard standing area.

No dredging or bottom levelling within the creek is required as part of these proposals.

1.4 Previous Reports

An initial Ecological Scoping survey was undertaken in 2010 (1), which identified a number of potential ecological effects of the proposed development, and recommended several further surveys that would be required to fully assess the ecological impacts of the proposals. As a consequence a habitat and vegetation survey, winter bird survey and bird disturbance investigative survey were undertaken. The results of these surveys were presented within an initial Ecological Assessment in 2011 (2), which also included an assessment of some of the likely impacts of the development. The previous version of this Ecological Assessment included the results of further survey work including a presence/likely absence survey for reptiles, a survey of the extent of eelgrass *Zostera* spp. beds and additional bird surveys. This Revised Ecological Assessment also presents results of an additional botanical survey of the proposed nature reserve area.

1.5 Legislation and Policy

1.5.1 Introduction

One of the aims of this report is to demonstrate that proposed development complies with relevant Planning Policy and nature conservation legislation. This section details the policy and legislation with which the development would need to comply.

1.5.2 Planning Policy

The development would seek to comply with relevant Planning Policy, at a local, regional and national level. Specific policies pertaining to the protection of biodiversity and nature conservation within the Borough of Havant are summarised below, for full details refer to the original documents.

- National government guidance is provided by National Planning Policy Framework (NPPF) (3) which places an onus on development to conserve and enhance biodiversity with a requirement for positive biodiversity outcomes wherever possible from the overall development process. The NPPF provides guidance to Local Authorities in how to conserve and enhance biodiversity through local Planning Policies and when assessing planning applications.
- Local Planning Policy is provided by the Havant Borough Core Strategy (4), part of the Havant Borough Local Development Framework. Policy CS11 *Protecting and Enhancing the Special Environment and Heritage of Havant Borough* contains sections which are concerned with the protection of biodiversity. This policy states that '*Planning Permission will be granted for development that* [only relevant parts included]*:*

  2. *Protects and where possible enhances the borough's statutory and non-statutory designated landscape, habitats and features of biological, hydrological or geological interest. Protection and enhancement will be achieved by appropriate adaptation and mitigation measures including wardening, education and information and the creation of new habitats, water bodies/courses planting of new trees and woodland.*
  3. *Has particular regard to the following hierarchy of nature conservation designations within the borough (as identified on the Proposals Map):*
     (i) Special Protection Areas, Special Areas of Conservation and Ramsar Sites
     (ii) Sites of Special Scientific Interest and National Nature Reserves
     (iii) Sites of Importance for Nature Conservation, Local Nature Reserves, other Ancient Woodland not identified in (ii) above.
  5. *Supports an ongoing programme of survey of habitats and species and designation of Sites of Importance for Nature Conservation.*
  6. *Incorporates partnership working with conservation organisations to improve public understanding of biodiversity and to manage public access to designated sites, particularly on the coast, to reduce harm to nature conservation interests.*
  7. *Incorporates partnership working with landowners and developers to ensure land management practices restore, enhance and where appropriate create new valued landscapes, habitats and their soil structure, particularly the ancient woodland remnants of the Forest of Bere and coastal salt marsh.*
  8. *Protects wildlife habitats and wildlife corridors to prevent the fragmentation of existing habitats and to allow species, for example Brent Geese, to respond to the impacts of climate change by making provision for habitat adaptation e.g. coastal managed realignment and species migration.*

1.5.3 Solent Brent Goose and Waders Strategy

The Solent Brent Goose and Waders Strategy (5) was prepared by the Solent Brent Goose and Waders Steering Group in order to provide guidance to Local Planning Authorities when assessing planning application with the potential to affect brent geese and waders. This contains eight policies (W&BG1-8), with which any proposed development should comply in order to ensure it would not result in harm to brent geese, and therefore comply with local planning policy (in this case Policy CS11, part 8 of the Havant Borough Core Strategy (4)).

1.5.4 Nature Conservation Legislation

The Wildlife & Countryside Act 1981 is the principal mechanism for the legal protection of wildlife and habitats in Great Britain. The Act includes the protection of scheduled species and the designation and protection of Sites of Special Scientific Interest (SSSIs). The parts of the Act most relevant to typical development activities are:

- The protection of wild birds
- The protection of animals listed in Schedule 5 of the Act
- The protection of plants listed in Schedule 8 of the Act
- The protection of Sites of Special Scientific Interest (SSSIs).

The Countryside and Rights of Way Act (CRoW) 2000 strengthened the Wildlife and Countryside Act by the addition of "reckless" offences in certain circumstances, such as where there is a likelihood of a protected species being present.

The Conservation of Habitats and Species Regulations 2010, known as the 'Habitats Regulations' (which supersede the_Conservation (Natural Habitats &c) Regulations 1994) transpose Council Directive 92/43/EEC (6) on the conservation of natural habitats and of wild fauna and flora (the Habitats Directive) into UK legislation. This legislation deals with:

- The protection of Special Areas of Conservation (SACs) and Special Protection Areas (SPAs)
- The protection of species listed in Annex II of the Regulations.

1.5.5 Biodiversity Action Plans

The UK Biodiversity Action Plan is the Government's response to the 1992 Convention on Biodiversity (The Rio Convention), with the aim of halting loss of biodiversity in the UK. Biodiversity strategy is implemented at a local level through county and district Biodiversity Action Plan (BAPs). The application site falls within the geographic area covered by the following BAPs:

- UK Biodiversity Action Plan (UKBAP, 7)
- Biodiversity Action Plan for Hampshire (HBAP, 8)
- Havant Biodiversity Action Plan (HvBAP, 9)

2.0 METHODOLOGY

2.1 Introduction

This chapter outlines the methodology by which the ecological effects of the proposed development of the Yachthaven site will be identified and assessed. The methodology used is based on the *Guidelines for Ecological Impact Assessment (EcIA) in the United Kingdom*, published by the Institute of Ecology and Environmental Management (IEEM) (10). This provides a thorough framework for the assessment of the ecological effects of a project, regardless of whether a formal Ecological Impact Assessment or EcIA is required.

2.2 Consultation

2.2.1 Pre-application

In order to ensure that all the potential effects of the proposed development are identified and addressed, consultation was carried out following the production of the Ecological Scoping Report (1) and previous Ecological Assessment (2). Prior to the production of the previous Ecological Assessment, Chichester Harbour Conservancy and Natural England were consulted and their comments addressed within the report. These were primarily concerned with protection of the SPA/SAC, in particular, quantifying the extent of the habitat made unavailable to birds and the potential for disturbance of birds using the site. Natural England also provided additional comments on the previous Ecological Assessment (24 August 2011), which highlighted the need for the following areas to be addressed further (the full response is included within **Appendix 1**):

- A more comprehensive understanding of the potential for increased bird disturbance would be required to be able to assess the compliance of the development with the Habitats Regulations.
- A greater understanding of the extent and status of eelgrass beds would be required.
- Further information regarding potential for coastal squeeze to occur.
- Information regarding dredging associated with dredging as a result of the development and for the purposes of maintaining boat access in the future.

2.2.2 Response to Initial Application

Responses to the initial application in November 2011 were received from the Chichester Harbour Conservancy, the Environment Agency, Natural England and the RSPB. These organisations objected to the proposals on the following grounds:

- Loss of intertidal habitats within the SSSI/SPA/SAC.
- Damage to eelgrass beds from boat movements.
- Disturbance of high water bird roost sites.

Subsequent to the initial application, the project proposals have been modified to specifically address these concerns.

2.3 Zone of Influence

The approach of the IEEM guidelines is to assess potential impacts to all features of ecological interest that would be affected by a scheme. As a scheme may have effects beyond its site boundaries, it is important to identify the "zone of influence" of the scheme and to assess the potential for significant impacts throughout this area. The zone of influence for the proposed Yachthaven development was defined in the previous Ecological Assessment (2) as to include the development site and to extend 1km into the estuary, which includes the local creek extending to Gutner Peninsula (approximately 750m from the development) and peripheral parts of Verner Common. Therefore, several statutory and non-statutory designated sites lie wholly or partly within the zone of influence, specifically:

- Chichester and Langstone Harbours SPA
- Solent Maritime SAC
- Chichester and Langstone Harbours Ramsar Site
- Chichester Harbour SSSI
- Fields & Saltmarsh South of Copse Lane SINC.

The zone of influence is extended beyond the site boundaries due to the potential of disturbance from increased boat traffic to affect feeding waterfowl using intertidal habitats, or grasslands at the edge of Verner Common as well as roosting birds on land. The zone of influence inland is likely to be smaller, within 500m of the site, i.e. with respect to potential disturbance from site construction and increased terrestrial activities such as dog-walking.

The zone of influence will vary between ecological features. For example the zone of influence upon high-tide feeding roosts will cover the extent of boat traffic movement along Yachthaven creek (approximately 750m), however the zone of influence upon low-tide feeding areas will be restricted to those areas adjacent the proposed development and may only cover an area extending 100m to 200m from the application site into Yachthaven creek. The location of the designated sites is shown on **Map 1** and the zone of influence on **Map 2**.

2.4 Determining the Value of Ecological Features

In order to inform the assessment of impacts from the proposed development, it is necessary to evaluate the ecological features or resources (e.g. designated sites, populations of protected species, etc.) within the zone of influence in nature conservation terms. Evaluation of ecological features or resources can be difficult due to their often complex nature and several factors can be considered when assigning a value to a particular feature (e.g. legal protection, identification within planning policy or BAPs, rarity, potential future value or supporting value, social or economic value). The IEEM guidelines use a geographical scale to describe the value of an ecologically important feature or resource, i.e.:

- International
- UK
- National (England)
- Regional (London and the South East)
- County (Hampshire)
- District (Havant Borough)
- Local (Hayling Island)
- Less than local (i.e. within the zone of influence only)

If an ecological feature or resource is considered to be of less than local value, it is not of sufficient value that a scheme could have a significant ecological impact by having an effect upon it. Therefore, any features of less than local value are not considered within the impact assessment section.

2.5 Impact Assessment

The assessment of impacts, in line with IEEM guidance is undertaken in relation to the baseline conditions within the zone of influence that are expected to occur if the scheme were to not take place. The assessment also evaluates the impact in terms of magnitude, geographical extent, duration, reversibility, timing, frequency and certainty of occurrence (Probable (50-95% confidence); Unlikely (5%-50%); or Extremely Unlikely (<5% confidence)).

A significant impact is considered likely to occur if the scheme is likely to affect the integrity of an ecological feature or resource in such a way that will cause a change in the 'conservation status' of the feature or resource. Conservation status is determined by the sum of the influences acting on a habitat or species, which may affect its long-term distribution, abundance, structure and functions within a given geographical area.

2.6 Identification of Likely Biophysical Changes as a Result of the Proposals

2.6.1 Introduction

In order to be able to assess the impacts of a development, it is first necessary to identify any activities that may result in biophysical changes which could have an effect on features of ecological value. There are three stages of this scheme that would entail activities which may have an impact on such ecological receptors; site preparation, construction and operation. Proposals may result in impacts that extend beyond their geographical boundaries, therefore any biophysical changes within the zone of influence of the development are also considered.

2.6.2 Site Preparation Activities

Clearance of vegetation and topsoil stripping from the site would result in damage to and physical loss of habitats present within the development area. As well as any intrinsic value which these habitats might have, they may also support other features of ecological value,

such as protected or notable species. Should clearance take place whilst individuals of a protected/notable species are present within the cleared habitat, death or injury to those individuals could occur. If significant numbers are killed, it may have a negative impact on the viability of populations within the zone of influence.

Clearance work on the site will entail an increase in the presence of humans and machinery on the site, with an associated increase in noise. This could result in an increase in disturbance levels of birds and other wildlife within the vicinity of the construction area. If significant, this could affect the ability of groups of birds to forage and roost and may affect other areas of behaviour.

2.6.3 Construction and Landscaping Activities

Construction and landscaping of the new dwellings and the associated infrastructure would ensure that any habitat lost during site preparation would be permanent. The location of the new pontoon could result in direct damage and loss of marine, intertidal and coastal habitats and disturbance of wildlife using these habitats. Significant damage and/or disturbance could result in a loss in conservation status of affected habitats or species.

As with site clearance, construction work will result in an increase in the presence of humans and machinery on the site. The construction methodology includes pile-driven supports for the pontoon and retaining wall respectively, which may result in high noise levels. This could result in an increase in disturbance levels of wildlife, particularly birds, within the vicinity of site. If significant, this could affect the ability of groups of birds to forage and roost and may affect other areas of behaviour during the construction period.

Construction and landscaping may create suitable habitat for some species, particularly the areas of green space, which will be landscaped and managed for the benefit of nature conservation.

2.6.4 Operational Activities

The proposals would result in an increased human presence on the site, which could result in an increase in disturbance levels of birds using habitats adjacent to the site. The proposals will also result in increased boat traffic at the site and within the creek, which, again may lead to an increase in disturbance of birds and other aquatic wildlife. If significant, this could affect the ability of groups of birds to forage and roost and may affect other areas of behaviour.

Operational use of the pontoon has the potential for on-going disturbance and damage of marine and intertidal habitats to be caused by boats.

2.7 Data Sources

Data to inform the ecological assessment of the proposals has been gathered from a number of sources, including pre-existing data and field surveys. Pre-existing data has been retrieved from the following sources:

- A data request was made to the Hampshire Biodiversity Information Centre (HBIC) to obtain locations of Sites of Importance for Nature Conservation (SINCs), records of protected species and details of other features of nature conservation interest within 1km of the site (see **Appendix 2**).
- Wetlands Birds Survey (WeBS) data for Chichester Harbour was purchased from the British Trust for Ornithology (BTO). The data obtained comprises core counts (counts of high tide waterfowl roosts) and low tide counts (counts of waterfowl using intertidal areas at low tide) of the whole estuary and for the relevant count sectors covering within the zone of influence.
- The Hampshire and Isle of Wight Wildlife Trust (HWT) were contacted to obtain raw data for Brent Goose and waders sites in the vicinity of the development, used in the preparation of the *Solent Waders and Brent goose Strategy* (5, see **Appendix 3**).
- Data was obtained relating to fish within Chichester Harbour from Portsmouth University.
- Online resources including the National Biodiversity Network (NBN) website for records of protected and/or notable species of plants and animals, and Multi-Agency Geographical Information for the Countryside (MAGIC) website for information on the extent of statutory designated sites.
- Other published resources; particularly relating to bird disturbance within the Solent's protected areas.

Following the initial Ecological Scoping Survey (1), based on the habitat types and features present on the site, as well as pre-existing data for the area, the following field studies have been undertaken at the site during the appropriate season:

- General site ecological appraisal and habitat survey (October 2010)
- Botanical survey (February-March 2011 and May 2012)
- Barn Owl survey of buildings (March 2011)
- Assessment of bird disturbance (March 2011, October 2011)
- Eelgrass survey (September 2011)
- Reptile survey (September-October 2011)
- Intertidal bird counts and high tide roost counts (October 2011)

All field surveys were undertaken following relevant best practice guidance. Details of the methodology for each survey are provided in the relevant appendices if appropriate.

3.0 ECOLOGICAL BASELINE

3.1 Introduction

This chapter describes the current and predicted ecological baseline within the zone of influence based on the field studies and pre-existing information from the sources indicated in Section 2.6. It also provides a geographical valuation of each feature of ecological interest as required by the IEEM guidelines on Ecological Impact Assessment (10).

3.2 Natural Area

Yachthaven is located within the South Coast Plain and Hampshire Lowlands Natural Area (11), which is split between the generally open, often featureless landscape of the coastal plain and the more varied landscape in the west. The Natural Area contains a number of nature conservation features, including the undeveloped shoreline of Chichester Harbour, with picturesque harbour side settlements typically clustered around small boatyards, while numerous moorings and marinas dot the harbour.

3.3 Site Context

3.3.1 Land-use History of the Site

Historically the site appears to have consisted of open field with a small pond on the coastline, as shown on early edition OS Maps 1870 to 1932, with development activities first appearing on 1938-1942 OS Maps. By 1953 the site is called Yachthaven with a landing stage illustrated in the estuary in the same location as the proposed pontoon, slipways marked next to the former pond and an expansion of the associated buildings. The pond is marked on 1972 OS maps, but is no longer present on site. At the time of the initial surveys the eastern side of the site consisted of bare earth, having had been recently heavily disturbed from scrub removal activities (likely to have been largely bramble and gorse). Ordnance Survey maps suggest that the area proposed for development was formerly an active boatyard (late 1930s to 1970s).

3.3.2 General Description and Topography of the Application Site

At the time of the Ecological Scoping Survey October 2010 survey (1), the site supported ten (largely derelict) buildings in various states of repair. A small boatyard in current use is located on the shore of the creek and has an associated wet dock, wooden structured workshop (separate but directly adjacent the application site) and further hard-standing area (see **Figure 1**). Both the existing and derelict boatyards may have been infilled to the present ground level (approximately 1.5m above the high tide mark), although there is no evidence of significant reclamation over the last 150 years, from First Edition OS Maps.

Figure 1: Foreshore of the development site showing buildings of the former boatyard.

The proposed pontoon extends into an intertidal creek that forms part of Chichester Harbour estuary, supporting estuarine mudflats. The intertidal is between 75m and 150m in width at the point of the southern edge of the site to the adjacent northern creek shoreline to Verner Common. Below the mean high tide mark, the sediments show a narrow width of gravel substrates at the higher range of the tidal level, but with a significant amount of exposed mud sediments over much of the tidal creek. The creek adjacent to the site is dominated by upper shore seaweeds of the genus *Fucus* (bladder-wracks). The width of the creek narrows to the east to an abrupt end and widens significantly to the east, towards the central intertidal area of the main harbour. At the head of the creek is a strip of vegetation between the shoreline and seawall, comprising saltmarsh plant communities west of the proposed pontoon.

The proposed development site is bounded to the west by an old hedgerow and to the east by a line of scrub with some young trees. The western part of the site ownership consists of unimproved coastal grassland, partly invaded by bramble and thorn scrub (part of the Fields and Saltmarsh South of Copse Lane SINC). This is partly bounded by hedgerows and mature trees.

3.4 Protected Sites

3.4.1 Chichester and Langstone Harbours SPA

Chichester and Langstone Harbours SPA is designated for its internationally important populations of summer breeding and overwintering birds. At the time of designation, the site supported 5.7% of the overwintering population of dark-bellied brent geese *Branta bernicla bernicla*, as well as nationally and internationally significant populations of a

number of other wildfowl and wader species. The site also qualifies as an SPA for its overwintering bird assemblage, numbering in excess of 93,000 individual birds (12).

The site is vulnerable to a number of factors which may affect its conservation status. These include significant recreational pressures, especially during summer months; effluent discharges and agricultural run-off can lead to localised eutrophication problems (although elevated nutrient levels are maintained by inputs from coastal waters); sea-level rise and coastal squeeze are significant threats to the long-term maintenance of habitat diversity as are the incremental loss of fringing habitats and transitional communities as hard coastal defences are maintained by land-owners (12).

Due to its designation, Chichester and Langstone Harbours SPA is of **international value**.

3.4.2 Chichester and Langstone Harbours Ramsar Site

Chichester and Langstone Harbours are designated as a Ramsar Site Wetland of International Importance designated under the International Convention on Wetlands of International Importance Especially as Waterfowl Habitat (the Ramsar Convention). The designation is for essentially the same features as Chichester and Langstone Harbours SPA (14), therefore for the remainder of this document they are considered together.

3.4.3 Solent Maritime SAC

The Solent Maritime SAC is designated on account of the presence of a number of ecologically important habitats listed in Annex I of the Habitats Regulations (13). Annex I habitats are listed below; habitats which are a primary reason for qualification are marked with an asterisk (*):

- 1130 Estuaries*
- 1320 *Spartina* swards (*Spartina Maritmae*)*
- 1330 Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*)*
- 1110 Sandbanks which are slightly covered by sea water all the time
- 1140 Mudflats and sandflats not covered by seawater at low tide
- 1150 Coastal lagoons
- 1210 Annual vegetation of drift lines
- 1220 Perennial vegetation of stony banks
- 1310 *Salicornia* and other annuals colonising mud and sand
- 2120 Shifting dunes along the shoreline with *Ammophila arenaria* ('white dunes')

In addition, the Annex II species, Desmoulin's whorl snail *Vertigo moulinsiana* is present, but not a qualifying feature of the site.

The Solent Maritime SAC is considered vulnerable to a number of factors including existing and proposed flood defence and coast protection works resulting in habitat and coastal squeeze of intertidal habitats due to coastal erosion and sea level rise; development pressures including ports, marinas, jetties etc, particularly when the proposals involve dredging to provide, improve or maintain deep water access, and land-claim of coastal habitats; potential accidental pollution from shipping, oil/chemical spills, heavy industrial

activities, former waste disposal sites and waste-water discharge; and the introduction of non-native species due to shipping activity (13).

Due to its designation the Solent Maritime SAC is of **international value**.

3.4.4 Chichester Harbour SSSI

Chichester Harbour SSSI is defined as '*a large estuarine basin in which at low water extensive mud and sandflats are exposed, drained by channels which unite to make a common exit to the sea. The site is of particular significance for wintering wildfowl and waders and also breeding birds both within the Harbour and in the surrounding permanent pasture fields and woodlands. There is a wide range of habitats which have important plant communities*' (15) The site is adjacent to Unit 8 of the SSSI, which from Natural England monitoring assessment during November 2010 consists "*mainly of Littoral Sediments in 'unfavourable recovering' condition, suffering 'coastal squeeze' as much of the unit is backed by hard sea defences*". Unit 6 assessed in January 2009, consists of neutral grassland 75 to 100m from the site and was in '*favourable*' condition (16). Due to its designation, Chichester Harbour SSSI is of **national value**.

3.4.5 Non-statutory Nature Conservation Sites

Six SINCs are present within 500m of the development site (see **Appendix 2**). These are: Verner Common West; West of North Hayling V; Fields & Saltmarsh South of Copse Lane; North Copse, Havant; West of North Hayling P and Gutner Farm. Of these, four (were designated in 2007 under Criterion 6B of Hampshire County Council's SINC Identification Criteria (17) following publication of the 2002 Hampshire Brent Goose Strategy (18) as they support important numbers of brent geese. Fields & Saltmarsh South of Copse Lane SINC was designated under Criterion 4A (semi-natural coastal wetlands) as well as Criterion 6B; further details of the vegetation and habitats within this SINC are provided within Section 3.3.3. The remaining site, North Copse, Havant, was designated under Criterion 1A (areas of semi-natural ancient woodland). All these sites are identified as being of **county value**.

3.5 Habitats and Vegetation

3.5.1 Introduction

The habitats and vegetation of the site and surrounding areas have been characterised from field survey data collected in October 2010, February and March 2011 and May 2012, as well as pre-existing information, including survey data, regarding the Fields & Saltmarsh South of Copse Lane SINC obtained from HBIC. In addition, the extent of the eelgrass *Zostera* beds was mapped in September 2011. The distribution of the different habitats on the site and is shown on **Map 3**, a full species list is provided in **Appendix 4**.

3.5.2 Vegetation of Boatyard and other Disturbed and Made-up Ground

The main part of the development site to the east of the existing boatyard consists of derelict and demolished buildings within an area of open, disturbed ground. Parts of the

area had previously become scrubbed over with bramble *Rubus fruticosus* and common gorse *Ulex europaeus*, but this had been cleared prior to the initial surveys in 2011 (see **Figure 2**). In 2012 the area had become vegetated over again with tall-growing grasses, perennial herbaceous species and sprawling bramble. The southern half of the area is more strongly nutrient enriched, supporting frequent nettle *Urtica dioica*, wild teasel *Dipsacus fullonum*, thistles *Cirsium* spp., curled dock *Rumex crispus* and hoary cress *Lepidium draba*. The northern half now supports some patches of species rich grassland with locally frequent common bird's-foot-trefoil *Lotus corniculatus* and oxeye daisy *Leucanthemum vulgare* in addition to the nutrient-demanding species listed above and a variety of other weedy species. The area is moderately damp in places, with small areas of standing water in small depressions and a ditch (following rainy weather in late spring 2012). These areas support locally abundant common fleabane *Pulicaria dysenterica*, willowherbs *Epilobium* spp., hard rush *Juncus inflexus*, false fox-sedge *Carex otrubae* and grey willow *Salix cinerea* scrub. The northern edge of the proposed development area also supports some shade-tolerant woodland herb species, including sedges *Carex* spp. Other noteworthy species that have colonised this area include spiked sedge *Carex spicata*, corky-fruited water-dropwort *Oenanthe pimpinelloides* and hairy sedge *Carex hirta*. A single plant of fiddle dock *Rumex pulcher* was found during the 2011 survey in the north-western corner of this part of the site, but was not refound in 2012.

Figure 2: Development site looking north to the location of the proposed houses. Cleared bramble scrub is the dominant vegetation.

Areas of compacted gravel and hard-standing occur around the boatyard areas and along the coastal footpath. These are long-established areas of made up ground, which have developed an interesting flora composed of mixtures of species characteristic of coastal turf and parched acid grassland, as well as supporting a variety of other small ruderal species, such as winter annuals (which grow during the winter and flower in early spring). The existing site access track is largely unvegetated.

The shortest vegetation occurs on the more disturbed and trampled gravel parking areas by the existing inlet and quay, and along the coastal paths. West of the boatyard the vegetation grades into areas of tall herb and dense scrub at the edge of the SINC. More frequent

species in the barer areas include annual meadow-grass *Poa annua*, squirrel-tail fescue *Vulpia bromoides*, biting stonecrop *Sedum acre*, creeping cinquefoil *Potentilla reptans*, black medick *Medicago lupulina*, buck's-horn plantain *Plantago coronopus* and pearlworts *Sagina* spp. Mosses are locally abundant. In early spring, noteworthy species include early forget-me-not *Myosotis ramosissima* (abundant), early meadow-grass *Poa infirma*, sea mouse-ear *Cerastium diffusum*, parsley-piert *Aphanes* sp., lesser chickweed *Stellaria pallida* and bird's-foot clover *Trifolium ornithopodioides.* A spike of bee orchid *Ophrys apifera* was found in the area west of the boatyard, near to the SINC boundary (and another spike within the SINC). A small colony of deadly nightshade *Atropa belladonna* occurs on bare substrate next to the inlet of the existing boatyard. This is a scarce species of chalk downland, but has presumably been introduced here with the infill material. The taller vegetation west of the boatyard is mainly composed of bramble, buddleia *Buddleja davidii* and tall herb species.

The varied ruderal vegetation of the heavily disturbed areas and coastal path is not referable to any described NVC type, but the small patches of established coastal grassland may be considered to approach **MC5** *Armeria maritima-Cerastium diffusum* maritime therophyte community. The NVC only sampled this vegetation from clifftops in western Britain and the described sub-communities are different to the vegetation occurring along the South Coast. The community is scattered along the Hampshire coast but is rarely very extensive at any particular site. Due to the fact that the community often supports rare or scarce coastal species, it should be considered as being of **district value**

The remaining taller vegetation over the disturbed areas is largely developing into **MG1b** *Arrhenatherum elatius* grassland, *Urtica dioica* sub-community and scrub vegetation, with small areas of **MG5a** *Cynosurus cristatus-Centaurea nigra* grassland, *Lathyrus pratensis* sub-community where bird's-foot-trefoil and oxeye daisy predominate. The habitats within the disturbed area of the former boatyard are commonplace and widespread locally and within the wider area and are therefore considered to be of **less than local value**.

3.5.3 Grassland

The western part of the application site, is part of the Fields & Saltmarsh south of Copse Lane SINC. This comprises largely unimproved, semi-natural grassland which is mainly well-grazed by rabbits, although a significant proportion of the area has become scrubbed over. A strip along the southern coastal edge has been tipped with brick rubble in the past, and due to enrichment has developed into species poor rough grassland and bramble scrub (**Figures 3** and **4**). The meadow lies over clay or other impeded soils with poor drainage in places, resulting in winter waterlogging or flooding. There is narrow ditch running through at the eastern end, which widens at the western end into a small saline depression.

Figure 3: Part of the Fields and Saltmarsh South of Copse Lane SINC showing species-poor grassland and encroaching bramble scrub.

Figure 4: Encroaching scrub within the coastal grassland

A survey of the grassland within the SINC was carried out by HBIC in September 2002. The survey recorded a total of 64 plant species including four 'old meadow' indicator species (see below); the results are broadly similar to the present survey. They estimated areas of 0.45ha of scrub, 0.3ha of neutral grassland (MG1, MG5 and MG6), 0.3ha of saltmarsh (SM16, SM24) and 0.15ha of tall herb and fen.

The current survey confirmed that the untipped land supports semi-natural grassland of significant nature conservation value. Next to the saline depression there is a narrow strip of brackish grassland dominated by red fescue *Festuca rubra*, with abundant saltmarsh rush *Juncus gerardii*, frequent strawberry clover *Trifolium fragiferum*, sea arrow-grass *Triglochin maritimum* and occasional patches of divided sedge *Carex divisa*. Occasional plants of two other species associated with this vegetation were also found: hairy buttercup *Ranunculus sardous* and narrow-leaved bird's-foot-trefoil *Lotus glaber*. This brackish grassland grades

into a thin zone of rainwater inundated grassland (not strongly brackish) dominated by creeping bent *Agrostis stolonifera*. These damp grassland communities occupy roughly 60-70% of the presently open areas of non-tipped grassland within the SINC (see **Figure 5**). The drier, northern edge of the meadow supports species rich neutral grassland dominated by red fescue, bent grasses and Yorkshire-fog *Holcus lanatus*, with locally abundant dyer's greenweed *Genista tinctoria*, occasional corky-fruited water-dropwort, pepper-saxifrage *Silaum silaus* and glaucous sedge *Carex flacca*, as well as a range of other more typical meadow herb species such as ragwort *Senecio jacobaea*, buttercups *Ranunculus* spp., common cat's-ear *Hypochaeris radicata* and common bird's-foot-trefoil. A small colony of green-winged orchid *Orchis morio* was found along the northern edge of the grassland near the western end of the site, and a single spike of bee orchid near the eastern end.

Figure 5: Ditch within the coastal meadow grassland.

Towards the eastern, less brackish end of the depression and along the ditch there are several common species of marshy ground, including rushes *Juncus* spp., marsh thistle *Cirsium palustre* and common fleabane. Velvet bent *A. canina*, a more local species of marshy habitats was recorded by the HBIC survey. Over the grassland generally some typical but uncommon wetland mosses occur, including *Bryum pseudotriquetrum* and *Fissidens adianthoides*.

A total of nine species have been recorded that are considered to be strongly associated with unimproved neutral to acid meadows (see **Appendix 4**). Eight of these occur in the semi-natural grassland, and one other (spiked sedge) was only seen on the development site. Of those present within the SINC, dyer's greenweed and pepper saxifrage are quite local in Hampshire, but occur in abundance in several similar localities around Hayling Island. Green-winged orchid occurs in the large gardens to the east of the site and is locally frequent elsewhere on Hayling Island.

Areas of rough, species poor grassland on the tipped areas are dominated by common couch *Elytrigia repens*, with nettle, thistles *Cirsium* spp. and teasel. The main part of the saline

depression supports some small patches of glasswort *Salicornia* sp. and the saltmarsh moss *Drepanocladus aduncus*.

Under the NVC the brackish grassland is referable to **SM16** '*Festuca rubra* salt-marsh community *Juncetum gerardi'*, but is of a species rich type frequent along the Hampshire coast, but not described as a sub-community in the published account. It may be considered closest to **SM16b** *Juncus gerardii* dominant sub-community but in Hampshire is often characterised by the abundance of divided sedge and strawberry clover, two species not present in the published NVC samples. The damp grassland dominated by creeping bent is referable to **MG13** *Agrostis stolonifera-Alopecurus geniculatus* sub-community. The drier grassland is well grazed by rabbits and has not been allowed to fully develop into a medium-tall grassland vegetation. It falls somewhere between **MG6b** *Lolium perenne-Cynosurus cristatus* grassland, *Anthoxanthum odoratum* sub-community and the slightly more herb rich **MG5** *Cynosurus cristatus-Centaurea nigra* grassland. Again, the community here dominated by dyer's greenweed is slightly unusual and rather local in a national context and is not closely referable to any of the described sub-communities; however, it may be considered a variant of the neutral sub-community **MG5a** *Lathyrus pratensis* sub-community (the other two sub-communities occur on acidic and base rich soils).

The rough grassland along the coastal edge consists of mixtures of **MG6** and **MG1a** *Arrhenatherum elatius* grassland, *Festuca rubra* sub-community, but other 'coarse' grassland communities may occur. The bramble scrub within this area can be classified as **W24a** *Rubus fruticosus* agg.-*Holcus lanatus* underscrub, *Cirsium arvense-C. vulgare* sub-community. .

The grassland habitats lie mostly within the Fields & Saltmarsh south of Copse Lane which is valued at a county level (as described in Section 3.2.5); the grassland is also covered by the HBAP and HvBAP. However, it should be noted that the condition of this habitat is declining due to increasing scrub cover and without intervention parts of this would be considered of only **district value** in light of current trends.

3.5.4 Hedgerows and Scrub

To the west side of the proposed development area and existing boatyard access track there is a semi-natural, species rich hedgerow following a low bank and ditch feature. The hedge is dominated by pedunculate oak *Quercus robur*, with senescent elm *Ulmus procera* (affected by Dutch Elm disease), hawthorn *Crataegus monogyna*, roses *Rosa* spp., elder *Sambucus nigra* and some old coppiced field maple *Acer campestre*. The hedge is strongly shading, so is dominated by ivy *Hedera helix* below, with some woodland shade-tolerant herbs, including butcher's-broom *Ruscus aculeatus* and stinking iris *Iris foetidissima*. It continues along part of the boundary of the site on the west side of the boatyard area, where grey willow *Salix cinerea* and holly *Ilex aquifolium* are also present. This hedge supports at least seven ancient woodland indicator plants (species usually associated with woodlands more than 400 years old), indicating that this is an old hedgerow.

East of the development site there is a thin belt of shrubs and immature trees, approximately 3-4m wide, but widening out at the southern end into a patch of bramble scrub. This is composed of a mixture of native and non-native species, including poplar

Populus sp. and supports some woodland herbs, but there is no indication that this is an old hedge.

The northern edge of the SINC is bordered by a recently planted hawthorn hedge with a few mature pedunculate oak standards. The scrub which has invaded the meadow is predominantly composed of bramble and hawthorn with smaller clumps of blackthorn *Prunus spinosa*, occasional oak saplings, elder and other shrubs. Some small grey willow trees occur on either side of the existing boatyard. The hedgerows and scrub support several typical and a few uncommon species of lichens, associated with slightly, but not strongly, nutrient enriched environments. The isolated, older hawthorn trees within the meadow, which are well exposed to sunlight, support the greatest cover of lichen species.

Under the NVC, the old hedgerows dominated by oak, with a woodland herb layer are referable to **W10c** *Quercus robur-Pteridium aquilinum-Rubus fruticosus* woodland*, Hedera helix* sub-community. This is very typical of coastal parts of Hampshire and in unmanaged hedgerows and woodlands generally. The developing thorn scrub in other parts of the site is dominated by hawthorn and referable to **W21a** *Crataegus monogyna-Hedera helix* scrub, *Hedera helix-Urtica dioica* sub-community.

The species-rich hedgerows on the site are considered to be of **local value**. The presence of the local lichen *Ramalina fraxinea* within coastal scrub habitat within the application site means that this is also considered to be of **local value**. Other scrub and hedgerow habitat is considered of **less than local value**.

3.5.5 Intertidal Habitats

The area of saltmarsh adjacent to the western part of the meadow (**Figure 6**) appears to be a particularly good example of this type of habitat, supporting a mosaic of different saltmarsh vegetation types and most of the typical associated species. Although parts of the area are dominated by common Cord-grass *Spartina anglica*, there are areas of more open, species rich vegetation with sea-lavender *Limonium* sp(p), red fescue *Festuca rubra*, thrift *Armeria maritima* and probably a variety of other maritime grasses and herbaceous species. The upper edge of the area is dominated by sea couch *Elytrigia atherica* and a small side creek supports a few square metres of annual glasswort vegetation. There are a few clumps of sea rush *Juncus maritimus* along the upper edge of the saltmarsh.

The infilled coastal bank to the east of the saltmarsh supports frequent plants of golden-samphire *Inula crithmoides*. These grow along the base or up to about half way up the bank, at or just above the mean high water mark. A few plants are also present just east of the boatyard.

The saltmarsh vegetation is referable to a number of NVC types, but the main ones discernible here are **SM6** *Spartina anglica* saltmarsh, **SM8** Annual *Salicornia* saltmarsh, **SM13c** *Puccinellia maritima* saltmarsh, *Limonium vulgare-Armeria maritima* sub-community and **SM24** *Elymus pycnanthus* [*Elytrigia atherica*] saltmarsh. All except SM13c are widespread and common types in estuaries of the Solent. The species rich type of saltmarsh, SM13c, is widespread but more local in distribution.

Figure 6: Saltmarsh habitat adjacent to the application site

Other parts of the adjacent creek are entirely dominated by larger seaweeds (**Figure 7**), except for relatively narrow strips of bare mud each side of the creek channel. Spiral wrack *Fucus spiralis* is strongly dominant throughout, but a few plants of horned wrack *F. ceranoides* and knotted wrack *Ascophyllum nodosum* are present in the area of the proposed pontoon (**Figure 8**). Sea lettuce *Ulva lactuca* is probably occasional throughout the area. All these species are common in the Solent and around British coasts generally. To the east of the pontoon area there are some more extensive areas of bare mud, which support beds of eelgrass species (see below) in late summer.

Figure 7: Overview of habitats within Yachthaven Creek adjacent to the development site.

Figure 8: Intertidal habitat at the proposed pontoon site dominated by larger seaweeds.

The majority of the intertidal habitats lie within one or more of the designated sites and therefore, as part of the designated site, would be considered of international value. However, considered individually, each of the habitats is of value in its own right. With the exception of the seaweed (*Fucus* spp. and sea lettuce) dominated habitats (considered to be of **less than local value**), these habitats are all priorities within the UKBAP, HBAP and HvBAP. The saltmarsh with sea lavender habitat is listed within Annex I of the Habitats Regulations and is considered of **county value;** the annual glasswort beds and cord-grass saltmarsh are considered to be of **district to county value**. The nationally scarce (although frequent on Hayling Island) golden samphire is also a HBAP priority species and therefore the colony present on the site is considered to be of **local value**.

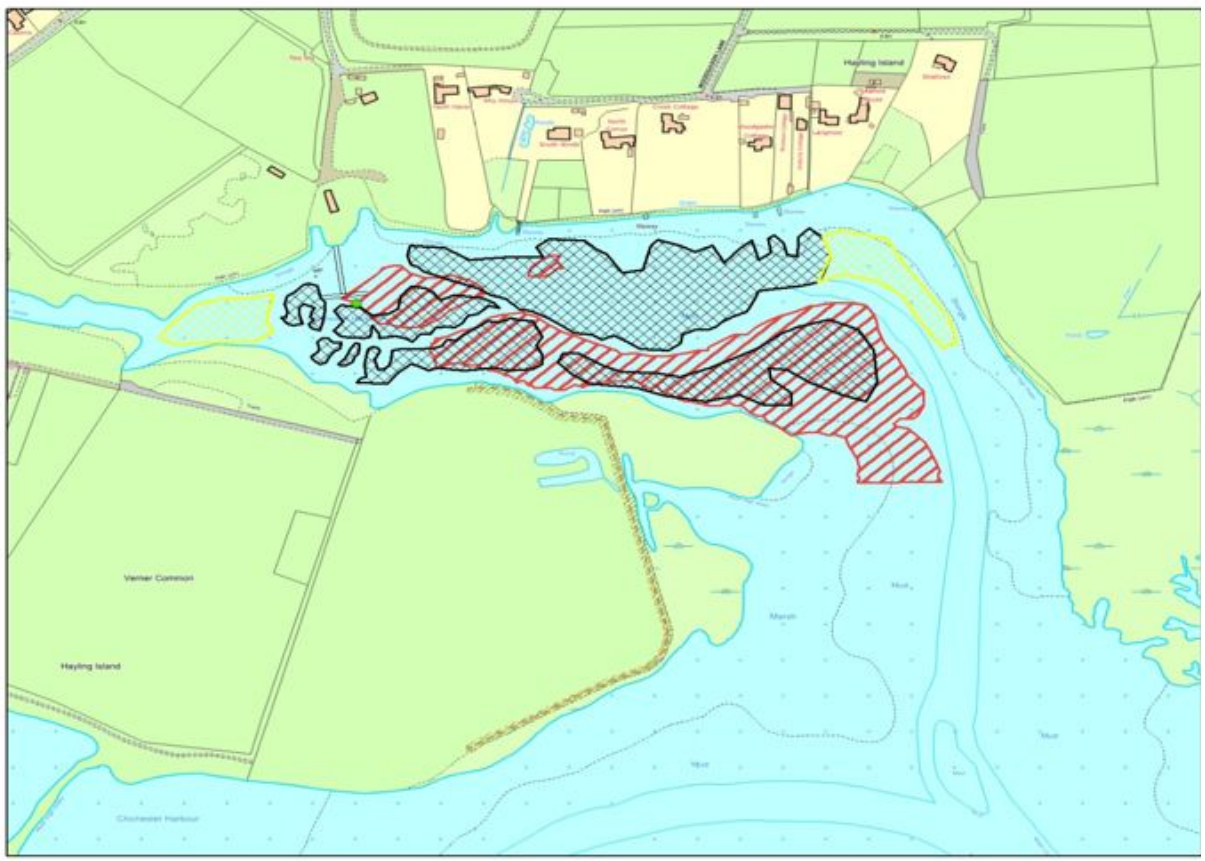
3.5.6 Eelgrass beds

. HWT compiled maps of eelgrass *Zostera* beds of Chichester Harbour (20) which show the results of surveys in Chichester Harbour from 1995-2005 and 2006-2008. The exact years of survey are not known but the distribution appears to have contracted when the more recent survey was carried out. The map indicates that *Zostera* grows in parts of the creek mostly to the east of the proposed pontoon area (in lower parts of the creek) and not at higher levels which are densely vegetated by larger seaweeds, as would be expected from the known habitat preferences and ecology of the species. Further smaller and fragmented beds are also distributed to the west of the proposed pontoon area.

A survey of the extent of the eelgrass within the zone of influence was undertaken in September and October 2011**.** The beds' extent and positions were determined on an aerial image through a combination of on shore observations using optical aids and wading out through the channels at low tide. Bed extents were recorded with a hand held GPS device, mapped in the field and later quantified using Geographic Information Systems (GIS). The qualitative on shore visual observations were then drawn as polygons over the aerial image using the GPS points to define bed positions and extents. The survey methodology followed

the JNCCs marine monitoring handbook (21) as far as was possible. However, in some instances this was not possible, such as the timing of the survey falling outside the optimum period (May – August) and the most recent remote sensing data available being three years old. Using the polygons created by the site visit, the eelgrass beds are estimated to be 3.74ha (**Figure 9**) in area and therefore currently represent approximately 3.74% of the total area of eel grass in the harbour (22).

The HWT survey (20, see **Figure 9**) recorded the extent of the eelgrass beds within the zone of influence as 3.27ha. There was a marked difference between the two surveys in the spatial distributions of the beds and in particular the northern bed adjacent to the row of shoreline houses. However, when comparing the approximated areas for the two surveys the 2011 data indicate an increase of 12.6%. During the 2011 it was noted that the beds appearing fragmented in nature (i.e. density falling below 50% coverage, qualitatively assessed on site using a 0.5m^2 quadrat). In these instances (plotted as yellow polygons in the map) the egg wrack *Ascophyllum nodosum* which dominates the near shore eulittoral zone, is encroaching into the normally dense monospecific *Zostera* spp. stands, which may be indicative of some form of disturbance already occurring. For the remaining beds density largely exceeded 85% by coverage. The channels present were also covered by *Ulva* for approximately 2m on both sides and thus causes a further degree of fragmentation between beds although likely to be a naturally occurring fragmentation.



OS map replicated under licence. Licence number 100048821

Figure 9: Extent of eelgrass beds within the zone of influence. Red hatched areas show the extent of the eelgrass in 2008 (20), black and yellow crosshatched areas show the extent of eelgrass in 2011 based on field survey data with the yellow crosshatching indicating areas where the eelgrass is fragmented (Scale 1:4,000).

During the late summer/autumn 2011 period up to four boats were moored on swinging moorings within the creek (see **Figure 10** for an example). Within the vicinity of these moorings, damage to the habitat was apparent due to the ridge of the hull of the moored boats creating substantial ridges and scars within the eelgrass bed, effectively reducing the extent of the beds (**Figures 11** and **12**). With relevant permission and licences, it is understood that presently 26 swinging berths are available in the Yachthaven Creek from Chichester Harbour Conservancy. The latest eelgrass survey carried out during Autumn 2011 has shown that eelgrass beds are widespread although increasingly fragmented over Yachthaven and that there would be very few areas where swinging berths would not have at least some adverse impact upon the eelgrass beds, potentially causing a significant reduction in the overall quantity and distribution. This may have long term negative influences such as encroachment and colonisation from other less ecologically important species such as sea lettuce *Ulva lactuca* and *Fucus spp*, or erosion of soft sediments with the continuous scaring and scraping of the sediments from long term use and likely reducing the likelihood of re-colonisation by eelgrass. This may be an explanation for the apparent fragmentation of the eelgrass beds when the recent extent is compared to that from 2008 (20).

The eelgrass beds within Chichester Harbour as a whole are an important feature of the Solent Maritime SAC and are vital for the bird populations which are features of the Chichester and Langstone Harbours SPA/Ramsar Site/SPA. They are an Annex I habitat under the Habitats Regulations and are a priority within the UKBAP, HBAP and HvBAP. Therefore, the eelgrass beds within the zone of influence are considered to be of **national value**, although they may be declining in quality as a result of swing moorings.

Figure 10: Boat (approximately 8m in length) on swing mooring present within the creek during the 2011 eelgrass survey. Damage to the eelgrass can be seen in the foreground.

Figure 11: Damage to eelgrass bed caused by the hull of the boat on the swing mooring scraping the surface of the mud.

Figure 12: Damage to sediments within the intertidal zone caused by boats on swing moorings.

3.6 Birds

3.6.1 Introduction

Chichester Harbour is an internationally important site for breeding and overwintering birds (in particular dark-bellied brent geese which use the site from October to April), hence its designation as an SPA. The birds utilise intertidal habitats within the SPA (particularly *Zostera* beds) for feeding and roost in habitats above high water. However, a significant proportion of the birds feed in habitats such as amenity grassland and cereal fields, outside of the SPA. Consequently, although such areas may not be protected, they are considered

important in maintaining the conservation status of the SPA, as if they were unavailable to feeding birds, bird populations may suffer a reduction in conservation status.

In 2002 the *Hampshire Brent Goose Strategy* (18) which identified many sites outside of the SPA used by brent geese many of which were subsequently designated as SINCs. An updated study was carried out during 2006-2009, which also covered roosting sites for waders and subsequently published as part of the *Solent Waders and Brent Goose Strategy 2010* (5). The fundamental aim of the Strategy is to help reduce conflict between needs of wintering waders and human pressures by promoting an integrated approach to land use and management. The aims of the study were not only to identify important feeding sites for Brent Geese and roosting sites for waders, but also to characterise the features of these sites in order to identify potential areas for habitat creation. The study also sought to identify sites vulnerable to sea level rise and explore the effects of development pressure and significant changes in coastal management on the current resource (5).

Within the Strategy, sites have now been classified separately for brent geese and waders, using the following categories:

- Important
- Uncertain
- No recorded use

The 'important' category applies to all sites identified in the Strategy as being currently used by waders and/or Brent Geese are as they are '*all considered to form part of the ecological network of sites used by birds*' (5). The 'uncertain' category is used for sites where there was insufficient survey data or regularity of survey visits to assess whether a site was important or not. The 'no recorded use' category is used for sites where regular surveys had been carried out but geese were not recorded. Therefore, it follows that even important sites may not necessarily hold large numbers of brent geese or waders, only that they support regular numbers and contribute to the total habitat resource. Some sites classified as 'uncertain' may support numbers of brent geese or waders, but many are likely to be sites that have never supported waterfowl, with their classification due to a lack of data.

Sites identified within the Strategy (5), which fall wholly or partly within the zone of influence the proposed development are shown in **Table 1** and on the **Map 4**. Pre-existing information (from HWT) on the use of these sites by birds is shown in **Table 2**, data is provided in **Appendix 3**.

Table 1: *Solent Waders and Brent Goose Strategy (5) sites within the zone of influence*

Site Code	Site Description	Brent goose classification	Waders classification
H51	Western main field of Verner Common and farmland to west, as far as the main island road. Largely short-term ley (sown) grassland, used for horses.	Important	Uncertain
H55	Grass field to west of Fields and Saltmarsh South of Copse Lane SINC and beyond the caravan park.	Not classified	Uncertain
H56	Fields and Saltmarsh South of Copse Lane SINC and three large horse-grazed fields to the north, separated by hedgerows	Uncertain	Uncertain
H57	Series of about six large fields to east and north of Yachthaven, beyond the adjacent mobile home park. Largely horse-grazed, improved to semi-improved pasture.	Uncertain	Uncertain
H58C	Semi-improved pasture, part of HCC Gutner nature reserve; grazed by cattle.	Uncertain	Uncertain
H58D	Small areas of grassland divided by hedgerows with trees. Mostly improved, horse-grazed.	Not classified	Uncertain
H78	Saltmarsh areas on Gutner peninsula.	Uncertain	Important
H79A	Saltmarsh areas on the eastern end of Verner Common.	Uncertain	Important
H79B	Area of scrub and trees at extreme eastern end of Verner Common.	Uncertain	Uncertain
H89	Eastern main field on Verner Common.	Uncertain	Uncertain

Table 2: *Pre existing records of birds within Solent Waders and Brent Goose Strategy (5) sites within the zone of influence. Negative records not shown.*

Site Code	H51	H55	H56	H57	H58C	H58D	H78	H79A	H79B	H89
Brent goose	1200	-	33	27	90	-	1300	400	44	75
Bar-tailed godwit	-	-	-	-	-	-	400	-	-	-
Black-tailed godwit	-	-	-	-	-	-	250	11	-	-
Curlew	1	-	-	-	-	-	7	170	280	80
Dunlin	-	-	-	-	-	-	5000	200	-	-
Golden plover	-	-	-	-	-	-	600	250	-	250
Greenshank	-	-	-	-	-	-	4	-	-	-
Grey Plover	-	-	-	-	-	-	700	300	130	-
Knot	8	-	-	-	-	-	2000	15	-	-
Lapwing	-	-	-	-	-	-	255	420	21	-
Oystercatcher	144	-	-	-	-	-	110	100	-	-
Redshank	-	-	-	-	-	-	320	90	9	-
Snipe	-	-	-	-	-	-	5	3	-	-
Turnstone	-	-	-	-	-	-	28	10	-	-
Whimbrel	-	-	-	-	-	-	4	-	-	-

3.6.2 WeBS Core Counts

WeBS core count data was obtained for the more recent five-year period 2004/05 to 2008/09, both for the whole of Chichester Harbour and the local count sector (which

incorporates Verner Common and Gutner Peninsula). The data is summarised and is presented for selected species (i.e. mainly those occurring in larger numbers in the local area) in **Table 3** below. The data indicate that the total brent goose population for the estuary now stands at below 10,000 birds (mean annual peak of 9,397), but is still 4.7 times the internationally significant level. Curlew *Numenius arquata* numbers are equivalent to 99% of the national threshold. The estuary is no longer internationally important for ringed plover *Charadrius hiaticula*, grey plover *Pluvialis squatarola* or redshank *Tringa totanus*, whilst ringed plover numbers have dropped to just below the national importance threshold. The mean peak count for all waterfowl combined was 53,927 birds.

Table 3*: Mean peak counts and population significance for selected waterfowl species using Chichester Harbour and the Yachthaven are. Based on WeBS core count summary data 2004/05 to 2008/09. Significance: N = nationally significant, I = internationally significant.*

Species	Chichester Harbour total	Significance	Verner/Gutner sector	Proportion (%)
Dark-bellied Brent Goose	9397	I	1296	13.8
Shelduck	654	-	70	10.7
Wigeon	2429	-	49	2.0
Teal	1383	-	103	7.4
Pintail	247	-	2	0.8
Red-breasted Merganser	198	N	35	17.7
Oystercatcher	1442	-	75	5.2
Ringed plover	307	-	0	–
Golden plover	2024	-	367	18.1
Grey plover	1610	N	618	38.4
Lapwing	2493	-	387	15.5
Knot	1410	-	554	39.3
Dunlin	16,972	I	1744	10.3
Black-tailed Godwit	658	I	68	10.3
Bar-tailed Godwit	945	N	423	44.8
Curlew	1485	-	493	33.2
Greenshank	30	N	0	–
Redshank	1730	N	129	7.5

The data show that the Verner and Gutner roost sector are used by a significant proportion of the Chichester Harbour wader population, with peak counts for four species (grey plover, knot *Calidris canuta*, bar-tailed godwit *Limosa lampponica* and curlew) between 33 and 45% of the Harbour peak count. A further seven species, including brent geese had a peak count over 10% of the Harbour peak.

3.6.3 WeBS Low Tide Counts

The most recent low tide count data available for Chichester Harbour were for 2005/06. Although a survey was undertaken during the 2010/11 winter the data had not been fully compiled and were not available from the BTO to include in this report. **Table 4** presents the

winter 2005/06 low tide counts for the whole of Chichester Habour and the local count section, which takes in the creek adjacent to Yachthaven as far as the eastern side of Verner Common and across to the near the tip of Gutner Peninsula.

Table 4*: Peak low tide counts winter 2005/06 for selected waterfowl species using Chichester Harbour and the Yachthaven area. Based on WeBS low tide count data 2005/06.*

Species	Chichester Harbour total	Verner / West Gutner	Proportion (%)
Dark-bellied Brent Goose	6510	6	<0.1
Shelduck	567	10	1.8
Wigeon	1665	100	6.0
Teal	669	104	15.5
Pintail	147	2	1.3
Red-breasted Merganser	191	0	–
Oystercatcher	772	21	2.7
Ringed Plover	81	3	3.7
Golden Plover	1910	0	–
Grey Plover	1227	4	3.2
Lapwing	2067	3	0.1
Knot	762	0	–
Dunlin	11265	10	<0.1
Black-tailed Godwit	472	15	3.2
Bar-tailed Godwit	463	0	–
Curlew	746	4	0.5
Greenshank	23	1	4.3
Redshank	751	21	2.8

Allowing for the fact that this data covers only a single winter (for certain species numbers can vary greatly from winter to winter) the data indicate that this sector is relatively poorly utilised at low tide by most of the key species in the estuary. The most significant proportional use is by teal *Anas crecca*, for which the peak count of 104 corresponds to a peak count of 669 for the whole estuary (15.5%). Waders that normally feed on open, muddy substrates, such as ringed plover, dunlin *Calidris alpina*, grey plover, knot and curlew occur at very low numbers in the section. The best represented species are oystercatcher *Haematopus ostralegus*, black-tailed godwit *Limosa limosa islandica* and redshank.

3.6.4 Field Surveys

Prior to the production of the original Ecological Assessment (2), tidal cycle counts were undertaken on three dates between 19 October 2010 and 4 March 2011 and an additional two low tide counts were carried out during an exceptionally low tide on 21 March 2011. The tidal cycle counts each consisted of six separate counts at hourly intervals on a high to low tide and the counts on 21 March were carried out during late afternoon, approximately 2.5 hours and 0.5 hours prior to the time of full low tide. High tide counts were also carried out for Verner Common saltmarsh and Gutner Peninsula (of the parts visible from the application site) during the tidal cycle counts. The locations of these areas are shown in **Map 5**, see **Figure 13** also. During the February and March tidal cycle count surveys, specific high tide counts were carried out of both the Gutner and Verner Common saltmarsh areas.

These survey data were supplemented with further (ongoing) survey work during September to November 2011, following the same methodology.

Figure 13: Verner Common as viewed from the application site at high tide.

The survey area was divided into six compartments (A-F), which are shown on **Map 5**:

Compartment A - Head of Yachthaven Creek
Compartment B - Estuary directly adjacent application site
Compartment C - Estuary south-east of application site about 150m from pontoon
Compartment D - Estuary south of application site adjacent Verner Common
Compartment E - Estuary south-east of application site adjacent Verner Common
Compartment F - Estuary at mouth of Yachthaven Creek

During each survey any sources of disturbance to birds was also recorded including natural disturbance (e.g. predators) and anthropogenic disturbance; and the birds' reaction to it, if any.

The results of the intertidal cycle and low tide count surveys undertaken to date are summarised in **Table 5**, which presents peak counts for each bird species recorded in each compartment intertidal cycle. **Table 6** and **Table 7** present counts of high tide roost surveys and other records of bird use of Gutner Peninsula and Verner Common respectively. The full field survey results are given in **Appendix 5**.

Table 5. *Peak counts recorded during intertidal cycle and low tide count surveys (to date).*

Species	**Compartment**					
	A	**B**	**C**	**D**	**E**	**F**
Little egret	1 (19 Oct 10) (4 Mar 11)	1 (19 Oct 10) (29 Oct 11)	1 (19 Oct 10) (4 Mar 11)	1 (21 Mar 11) (9 Nov 11)	3 (19 Oct 10)	2 (20 Oct 11)
Redshank	1 (17 Feb 11)	5 (17 Feb 11)	11 (5 Nov 11)	2 (17 Mar 11)	10 (19 Oct 10)	21 (19 Oct 10)
Curlew	-	1 (7 Oct 11)	3 (7 Oct 11)	2 (4 Mar 11) (5 Nov 11)	3 (4 Mar 11)	5 (19 Oct 10) (4 Mar 11) (9 Oct 11)
Brent goose	-	40 (29 Oct 11)	298 (26 Oct 11)	136 (29 Oct 11)	128 (29 Oct 11)	325 (19 Oct 10)
Oystercatcher	-	1 (4 Mar 11)	1 (4 Mar 11) (5 Nov 11)	2 (17 Feb 11)	5 (4 Mar 11)	11 (4 Mar 11)
Teal	-	-	6 (4 Mar 11)	4 (17 Feb 11)	18 (17 Feb 11)	35 (17 Feb 11)
Grey plover	-	-	-	-	3 (17 Feb 11) (4 Mar 11)	2 (5 Nov 11)
Shelduck	-	-	-	-	-	22 (17 Feb 11)
Mallard	-	-	-	-	-	2 (21 Mar 11)
Grey heron	-	1 (29 Oct 11)	-	-	1 (7 Oct 11)	-
Mute swan	-	-	-	-	-	2 (7 Oct 11) (12 Oct 11)
Little grebe	-	-	-	-	-	2 (26 Oct 11)
Wigeon	-	-	-	-	88 (26 Oct 11)	70 (29 Oct 11)
Pintail	-	-	1 (5 Nov 11)	-	2 (26 Oct 11)	-
Scaup	-	-	-	-	-	1 (26 Oct 11)
Lapwing	-	-	-	4 (9 Nov 11)	14 (5 Nov 11)	1 (29 Oct 11)
Greenshank	-	-	-	-	-	1 (29 Oct 11)
Common Scoter	-	-	-	-	-	1 (5 Nov 11)

Table 6: *High tide counts and additional observations at Gutner Peninsula. Due to torrential rain restricting visibility on the 26 October 2011 survey, exact counts could not be undertaken and some species may have been overlooked.*

Species	19 Oct	17 Feb	4 Mar	12 Oct	26 Oct	29 Oct	5 Nov	8 Nov
Little Egret	3	-	-	-	-	-	-	-
Brent Goose	56	550	268	-	730	-	-	-
Shelduck		22	25	-	-	-	-	-
Teal	-	18	-	-	-	-	-	-
Oystercatcher		73	57	-	few	-	-	-
Redshank	23	-	-	-	-	-	-	-
Curlew	250	420	290	290	100s	-	-	-
Black tailed godwit	-	14	-	-	-	-	-	-
Greenshank	34	-	14	-	-	-	-	-
Lapwing	-	200	185	-	-	-	-	-
Wigeon	-	-	-	-	large flock	-	-	-

Table 7: *High tide counts and additional observations at Verner Common.*

Species	19 Oct	17 Feb	4 Mar	12 Oct	26 Oct	29 Oct	5 Nov	8 Nov
Little Egret	-	-	-	-	-	-	-	-
Brent Goose	355	234	45	-	20	80	36+	17
Shelduck	-	-	3	-	-	-	-	-
Teal		35	17	-	-	-	-	-
Oystercatcher	-	14	7	-	-	-	-	-
Redshank	21	28	12	-	-	-	-	-
Curlew	5	362	78	-	-	-	1+	-
Black tailed godwit	-	-	3	-	-	-	-	-
Greenshank	-	1	-	-	-	-	-	-
Lapwing	1	65	117	-	-	-	3	6
Grey Plover	-	3	3	-	-	-	-	-
Canada Goose	-	-	-	-	ca. 18	-	26	33+
Greylag Goose	-	-	-	-	-	-	1	-

3.6.5 Summary of Bird Data from Within the Zone of Influence

The bird survey data from all sources (field surveys/WeBS/HWT) are summarised below by species, for full details, see **Appendices 3** and **4**. The results of the winter bird survey and the WeBS low tide data strongly indicate that brent geese and waders use the creek adjacent to Yachthaven in extremely small numbers. The pattern of use is also evident from the habitat, which is dominated by larger seaweeds, without any extensive muddy areas preferred by most species of waders. However, at certain times of the year, such as during harsh winter periods, the creek may become more important as a feeding site on account of its sheltered location. There is also a possibility that the creek may be used by more feeding birds during late summer before the eelgrass dies off.

Little Grebe

Two little grebes *Tachybaptus ruficollis* were feeding in the main channel on the west side of Gutner (compartment F) on 26 October 2011.

Little Egret and Grey Heron

Single or occasionally two individuals of both of these species have been observed feeding in the creek. A Little egret *Egretta garzetta* was present on most of the visits during the winter 2011/12 survey, but on some counts may have been feeding out of view in the channel, and not recorded in the data. During this time a bird was regularly seen opposite the development site, feeding on or near the channel between compartments B and D. One grey heron *Ardea cinerea* was recorded on 7 October 2011.

Mute Swan

The only records of mute swan *Cygnus olor* were two birds in compartment F on 2 and 12 October 2011.

Brent Goose

Yachthaven Creek supports extensive beds of *Zostera*, on the mid to low tide reaches of the intertidal mudflats, extending up to compartments B and D. The low tide data collected during the two survey periods (2010/11 and 2011/12 to date) indicate that brent geese feed on the *Zostera* in relatively small numbers on a regular basis and occasionally in large numbers. These conclusions are still somewhat tentative because no surveys have yet been carried out during the mid-winter period of December and January when highest numbers of brent geese normally occur in the Solent. However, it is likely that during this time the geese feed mainly on amenity grasslands in the surrounding area. *Zostera*, and the alga *Enteromorpha*, were historically the main food source of wintering brent geese, but a change in behaviour occurred in the Solent area in the early 1970s, when birds began moving inland to feed on amenity grasslands, or occasionally cereal fields (23). Presently the geese utilise amenity grasslands as their main winter food resource and the *Zostera* beds are mainly visited in the early part of the winter period when the geese first arrive. The results so far from the present surveys tentatively suggest this is the case at Yachthaven Creek. The use of amenity grasslands has also allowed the population to expand considerably since historical times. Research has also demonstrated that brent geese prefer those pastures with higher nitrogen content (24) and it has been suggested that such grasslands are particularly important for juvenile birds which require higher protein content in their diet.

The first count carried out on 19 October 2010 was at the beginning of the main arrival period for brent goose in Chichester Harbour. A total of 325 were recorded at low tide in compartments E and F. During the late winter counts highest totals were 21 in compartment F on 17 February 2011 and 22 in compartment F on 4 March, but none were recorded on 21 March (at about the time when they begin to depart wintering grounds). During the Winter 2011/12 survey period, peak counts per visit were 1 on 7 October, (none on 9 October), 56 on 12 October (all in compartment F), 73 on 20 October (compartments D-F), 186 on 26 October (compartments D-F), 617 on 29 October (B-F), 185 on 5 November (B-D & F) and 14 on 8 November (B-D).

During the visit on 26 October about 730 were counted roosting on Gutner peninsula at high tide, but most of these departed to other feeding areas. On 29 October, no observation was made at high tide, but it can be assumed that the majority of Gutner roosting birds decided to enter Yachthaven Creek that day. These birds were spread evenly over the *Zostera* beds, feeding by probing beneath the mud for the basal part of each *Zostera* plant (containing below-ground rhizomes rich in protein and carbohydrates), then loosening it, rapidly swishing from side to side to remove larger particles of mud and swallowing. The birds did not take leaves of the plants directly from the surface - because the leaves of the plant tend to lay flat in a fan over the surface of the mud, consuming these would take much energy for little nutrient reward (it would only be possible to grab a few leaves at a time and break off fragments by pulling). The geese remained in the creek for the duration of the visit (i.e. a 2.5 hour period), but some also fed on Verner Common.

During the visit on 8 November when only 14 birds were present, a medium sized flock of brent geese (c.100) were present inland of the creek on a grass crop, suggesting that birds were already losing interest in feeding on *Zostera*. During this visit it was evident that *Zostera* was still plentiful in the creek and had not been significantly reduced in quantity by the feeding actions of the geese.

The WeBS core count five year data to 2008/09 give a mean peak of 9397 Brent Geese in Chichester Harbour and 1296 for the Verner Common/Gutner count sector. These two figures cannot be directly compared because the mean of the peaks for the whole harbour may be based on different months to the mean for the Gutner/Verner sector, but broadly it shows that approximately 14% of the harbour population use Gutner and Verner for roosting (or feeding) at high tide.

The detailed survey data indicate that except when large flocks of Brent are present in the creek, these tend to feed in the eastern compartments, especially C, E and F.

Wigeon

Wigeon *Anas Penelope* largely feed at night on grassland or saltmarsh and roost or 'loaf' during the day, often on intertidal areas if the tide is out. The daytime observations of these species were primarily of roosting flocks on the western edge of Gutner peninsula at high tide (88 on 26 October 2011) or on the extensive mudflat on the south side of the creek, extending north and eastwards from Verner Common (compartments E/F). Counts here included a maximum of 86 on 29 October 2011. No wigeon were seen any further west of here, using compartments B or D. The WeBS five year mean peak for wigeon in Chichester Harbour (to 2008/09) was 2429, with a mean of 49 for the Verner/Gutner count sector. The peak winter low tide count during 2005/6 was 1665 for the estuary and 100 for the Verner/West Gutner count sector.

Teal and Pintail

Only small numbers of teal and pintail *Anas acuta* were recorded during the survey, using similar areas to those used by wigeon. Gutner peninsula is used by a significant proportion of teal wintering in the harbour, with a five year mean peak of 104 corresponding to 669 for the whole harbour.

Scaup and Common Scoter

There were single records of these uncommon diving duck species in the main channel within compartment F. A Scaup *Aythya marila* was seen on 26 October 2011 and a common scoter *Melanitta nigra* on 5 November 2011.

Oystercatcher

Oystercatchers *Haematopus ostralegu*s roost on Gutner peninsula at high tide, with a five year mean peak of 75 recorded by the WeBS core counts compared to 1442 for Chichester Harbour combined. The creek surveys show that only small numbers feed in Yachthaven Creek at low tide, usually within compartment F, some distance away from the development site. The peak count during any survey was 8 on 12 October 2011, but typically only two birds were present.

Lapwing

Lapwing *Vanellus vanellus* normally roost during the day on mudflats or saltmarsh and feed at night on grassland, though some may also feed during the day. Small numbers were recorded roosting on mudflats on the south side of the creek in compartments D or E and also feeding on Verner Common. The highest count during the 2011/2012 survey was of 14 roosting in compartment E on 5 November 2011. In 2010/11 counts of 200 and 185 were made of birds roosting on Gutner in February and March, and peaks of 65 and 117 on Verner Common in these two months. These figures are similar to the combined mean peak total of 387 recorded from the five-year WeBS core count data. No birds were seen in close vicinity to the development site.

Grey Plover

Grey Plover was occasional recorded feeding on the mudflat east of Verner Common (compartments E/F). Highest counts were 3 on 17 February 2011 and 2 on 5 November 2011. The WeBS mean peak was 618 for the Verner/Gutner sector, compared to 1610 for the harbour, indicating that although a relatively high proportion roost on Gutner, nearly all do not feed in Yachthaven Creek.

Curlew

Small numbers feed in Yachthaven Creek at low tide. The data indicate that most records are for compartments C, E and F, but birds do regularly feed opposite the development site within compartments B and D. The highest total count during the 2010/11 survey was 5 on 19 October, and during the 2011/12 survey (to date), 8 on 7 October. Large numbers roost on Gutner peninsula, with counts of 250, 420 and 290 being recorded in October, February and March of the winter 2010/11 surveys. Birds also occasionally feed on Verner Common, with a large flock of 362 recorded in February 2011. These figures are broadly similar to the WeBS data, which gave a five year mean peak of 493 for Verner and Gutner combined, compared to a total 1485 for the whole harbour.

Greenshank

A small but significant population of greenshank *Tringa nebularia* winters in the Solent, with Chichester Harbour supporting a high proportion of these. The WeBS core count data give a five year mean peak of 30 birds, though none of these roosted on Gutner peninsula. The peak figure from the WeBS 2005/06 low tide survey was 23 birds. During the Yachthaven

Creek surveys there were records of one bird on 29 October 2011 (compartment F) and one roosting on Verner Common saltmarsh in February 2011, indicating that the creek is not regularly used by this species.

Redshank
Small numbers of redshank feed in Yachthaven Creek on a regular basis. Most sightings are from the eastern part of the creek in compartments C, E and F. Highest totals during the winter 2011/12 survey were 10 on 7 October and 12 on 5 November, though during most counts only 2-5 were typically present. During the 2010/11 survey period the highest counts were 23 on 19 October and 15 on 17 February. This survey also recorded roosts of 34 on Gutner peninsula and 28 on Verner Common saltmarsh in February. The WeBS core count data give a five year mean peak for the Gutner/Verner sector as 129, compared to 1730 for the whole harbour.

Other Species
A number of other species are known to regularly roost on Gutner peninsula, as shown by the WeBS core count data, but were not recorded in Yachthaven Creek during the surveys. Species include shelduck *Tadorna tadorna*, golden plover *Pluvialis apricaria*, knot and black-tailed godwit *Limosa limosa*.

3.6.6 Assessment of Existing Disturbance Levels

During the course of tidal cycle and high tide counts, any potential sources of disturbance to birds were noted. Very low level use by members of the public causing virtually no disturbance to wintering waterfowl using the creek was recorded. On most visits no people were seen and the maximum number of people seen was on a weekend date (29 October), when three people and three dogs were present for a relatively brief period during the counts; there were two also horse-riders observed on Verner Common on this date. During this visit there were very high numbers of brent geese feeding in the creek but only slight disturbance witnessed from one dog walker, which caused some geese feeding close to the shore to walk further out onto the mudflat. No bait diggers have been seen in Yachthaven Creek during the surveys. From other work carried out by the authors on sites in the Solent it is known that bait diggers rarely cause disturbance to birds.

Only one or two boat movements have been observed during the surveys. Use of boats can only occur at high tide when birds are not feeding in the creek. Small numbers of brent geese roost on the water in the eastern part of the creek and may be displaced by boat movements, but not greatly disturbed.

Buzzards *Buteo buteo* were witnessed on at least two occasions soaring over parts of the creek and caused serious but temporary disturbance to feeding brent geese by causing them to fly up from the mudflat. A similar but smaller amount of disturbance occurred when a grey heron flew into the creek to feed. There is also likely to be occasional disturbance from peregrine *Falco peregrinus*, which are known to winter in the Chichester Harbour area. Overall, however, disturbance from birds of prey and herons appears to be at a relatively low level.

3.6.7 Disturbance Investigation

During the high tide period on the 8 March 2011 an investigative survey was carried out incorporating the use of a six metre rigid hull inflatable boat (RIB), with two surveyors to view Gutner and Verner Common saltmarsh either side of the craft, whilst navigating the channel leading to Yachthaven from the main Chichester Harbour channel; four passes were made of the Yachthaven channel during the period. It is ascertained that watercraft would be able to navigate into the Yachthaven channel during the period of two and half hours either side of high tide, based upon standard neap tides, **Map 5** shows the route taken during this investigative survey. The first pass was undertaken at approximately 13:10 (carried out at slow speed with several pauses to allow for counts of the roosting birds present and estimate distances from the Yachthaven navigational) and the last pass at approximately 14:00. A speed of 8 knots which is the harbour speed limit was adhered to on three of the four passes. Although the speed limit within the harbour is recommended at 8 knots on the fourth pass the speed was increased to 20 knots to trial any possible effects of disturbance from significant wash against the roosting areas from any high speeding craft through the channel and increased noise from the RIB engine.

The navigational channel is physically marked by navigational signs marking the central Yachthaven channel passing through the area between the two high tide roosting areas. Distances from the central channel area to both the shoreline of Gutner, Verner and high-tide roosts were estimated at being no less than 60m at any given point along the channel to a maximum of 120m.

General behaviour of birds present was noted during each boat pass, including whether birds were alerted to the boat movements. Responses from birds such as alertness, e.g. raising their heads and walking away from their resting/roosting areas and whether this was proceeded by short or long flights or if no response was made.

Details of the boat disturbance survey are described for each pass along the creek. Maximum counts of species on the high tide roosts are shown in **Table 8**.

Table 8: *High tide roost counts during disturbance investigation.*

	Gutner Peninsula		Verner Common	
Species	**Number**	**Activity**	**Number**	**Activity**
Brent Goose	234	Feeding & resting	54	Feeding & resting
Teal	8	Feeding & resting	-	-
Curlew	280	Roosting	25	Roosting
Oystercatcher	56	Roosting	-	-
Redshank	26	Roosting	20	Roosting
Grey plover	-	-	31	Roosting
Dunlin	-	-	30	Roosting

Pass 1

During the first pass navigating the Yachthaven channel south to north counts were carried out of roosting and resting birds on western Gutner and the Verner saltmarsh. A flock of

curlew gathered but spread over an approximately 70m stretch along the south western tip of Gutner saltmarsh, located some 10m within the *Spartina* from the shoreline (see reference 25 for a film clip). A flock of 56 oystercatchers were gathered along the western Gutner shoreline and various smaller clustered groups of redshank and grey plover were distributed within and around the main roosting Curlew flock. In addition, at least 234 brent geese were scattered around the southern and western shorelines in various sized groups. The saltmarsh on the Verner side of the channel held a smaller number of birds and included the same species with the addition a small flock of dunlin roosting on the shoreline.

The first pass at 8 knots found no signs of increased alertness of birds towards the boat or its passengers. Three birds made short flights, possibly due to the presence of the RIB, but no major movements or flights of birds were noted.

Pass 2
Heading back southwards out of the channel again generally no movement of birds was noted or alert attitudes observed from any species or particular flocks or individual birds.

Pass 3
A closer route to the Verner Common saltmarsh and Gutner Peninsula was taken in order to assess the likely distance of 'non-tolerance' from the birds, to small boats able to access shallow waters. A distance of approximately 60m was taken from the main congregated roosting flocks of dunlin, grey plover, redshank and brent geese on the Verner shoreline and down to 30m from the main roosting flock of oystercatcher on Gutner Peninsula.

Birds on the Verner Common saltmarsh showed little reaction at the distance of approximately 70m, but started to show some signs of alertness at approximately 60m by showing awareness to the position of the RIB and walking slowly away. So as not to cause any significant disturbance to the birds, the RIB retreated from the area. No birds were noted to fly or move significant distances while the RIB passed by the roosting flock.

Passing the western shore of Gutner Peninsula and within a closer distance no alertness of birds was detected. The RIB was then steered towards a small flock of oystercatcher located on the shoreline to within a distance of approximately 30m, at which point the birds started to show signs of awareness of the presence of the boat. The boat was then moved away to prevent any real disturbance or stress to the birds.

Pass 4
The final pass of the roosting areas was carried out at an increased speed of 20 knots along the main channel. Observations indicated that the birds were not disturbed in any way.

In summary, no major flight disturbances were observed directly as a result of the RIB passing at the closest points to the two high-tide roosts within the navigation channel, although three birds, which may have been startled by the RIB, appeared to take a short flight on Gutner during the first pass. During the course of the survey three major disturbance events were recorded (each with 10-100+ birds taking flight), which were attributed to a buzzard flying over the roost on two occasions and a helicopter on another.

3.6.8 Evaluation

Overall it is evident from the existing WeBS count data and surveys carried out for this assessment that Yachthaven Creek is used in the late autumn and winter period by relatively small numbers of waterfowl species. Species occurring on a regular basis are little egret, brent goose, wigeon, oystercatcher, lapwing, curlew and redshank. Except for brent goose, all of these occur in very small numbers, in contrast to much larger populations in the whole harbour and some also do not venture into the western part of the creek adjacent to the proposed development (oystercatcher and lapwing). There is interchange with a nearby main roosting site on Gutner peninsula and also with Verner Common, which is used by brent geese, lapwing and curlew as a terrestrial feeding area at low or high tide.

There is limited data available for Brent Geese because the site has not be surveyed during the mid-winter period, but the evidence from the recent surveys (October to early November 2011) indicate that although a large quantity of *Zostera* was available to the geese, significant numbers were feeding on it on only one date (out of six visits when geese were present in the harbour in reasonably large numbers). There was still a large amount remaining in the creek by early November, when only 14 geese were present and a larger flock was seen feeding a short distance inland.

Within Chichester Harbour as a whole the wildfowl and wader assemblage is considered to be of international importance, as recognised by its SPA designation. However, within the zone of influence different features play differing roles in maintaining the conservation status of the SPA. The high tide roosts and saltmarshes at Gutner Peninsula and Verner Common contain significant proportions of the birds using the SPA (particularly brent geese) and are consequently considered to be of **international value**. Intertidal areas were utilised by lower numbers of birds for feeding and are therefore considered to be **local value**. Although is also noted that the creek has a number of negative physical characteristics for feeding waders and geese including its small size, an enclosed shoreline several metres above datum and the dominance of large seaweeds, creating lack of mud where waders can probe for invertebrates. Fields and Saltmarsh South of Copse Lane SINC and adjacent fields (within H56 of the Brent Goose and Waders Strategy (5)) are considered ecological features of **local value** for geese and waders, with potential for improvement.

3.7 Fish

In order to assess the importance of this habitat for any fish species present in the harbour data from fish surveys conducted throughout the harbour in 2004 was obtained from Dr. Paul Farrell from the University of Portsmouth. This survey was conducted using both a bean trawl net for a period of 10 minutes and seine nets. The survey was carried out at the mouth of the channel.

Twelve species were caught during the surveys with a number of species which can be thought of as being almost exclusively associated with eelgrass beds such as wrasse and pipefish (26). Ten species were caught by the beam trawls and two (bass and brill) caught

using a siene net. Overall the diversity for this survey area is low with the Shannon's diversity score being 0.73, reduced by the almost complete numerical domination of the sand goby *Pomatoschistus minutus* which is a year round resident in the harbour (22). The ecology of key species caught (by numerical importance) is briefly discussed in **Table 9**. For the remaining seven species only one individual was caught from the two trawls with these species provided in **Table 10**.

Table 9: *The most abundant species caught during the 2004 fish survey.*

Common name	Scientific name	Abundance	Habitat	Status
Sand goby	*Pomatoschistus minutus*	457	Inshore and sandy muddy sand, typically to about 20m but can be found deeper, juveniles found in lower estuaries	Widespread and common
Black sea bream	*Spondyliosoma cantharus*	134	Found over sea grass beds and sandy bottom substrates up to about 300m	Widespread and common
Painted goby	*Pomatoschistus pictus*	46	Inshore gravel and sand to 50 – 55m, young may occur inshore pools	Widespread and common
European sea bass	*Dicentrarchus labrax*	38	Littoral zone on various kinds of bottoms on estuaries, lagoons and occasionally rivers. They enter coastal waters and river mouths in summer, but migrate offshore in colder weather	Widespread and common
Corkwing wrasse	*Symphodus melops*	13	Occurs in the littoral zone near rocks though mainly in eelgrass beds (1 – 50m)	Widespread and common

Table 10: *Other fish species recorded during the survey.*

Common name	Scientific name
Ballan wrasse	*Labrus bergylata*
Greater pipefish	*Syngnathus acus*
Black goby	*Gobius niger*
Rock gunnel	*Pholis gunnellus*
Fifteen-spined stickleback	*Spinachia spinachia*
Pout	*Tricopterus luscus*
Brill	*Scopthalmus rhombus*

Most of the above species caught can be considered common and widespread, although some can be regarded as rare for this area, such as the fifteen-spined stickleback (22). Other notable species in this list, in terms of their use of *Zostera* as a habitat include the greater pipefish, ballan wrasse and black goby and are therefore likely to be utilising the eelgrass beds during high tides.

The intertidal nature of the creek means that any fish species present will be transient visitors utilising the shelter and food resources this habitat provides (27) when the tides are conducive. With no salmonid species discovered throughout the harbour and no discernable freshwater inlets present, it would not be anticipated that this channel would be of importance for migratory fish. Notwithstanding this, the number of fish species associated with *Zostera* beds recorded during the survey indicate they are a valuable resource within the channel for all life stages of the fish species present. It will also provide shelter for a range additional flora and fauna (such as epiphytic algae, plankton and invertebrate fauna), thereby enhancing overall species diversity in the channel. The fish assemblage recorded within the zone of influence is considered to be of **local value**.

3.8 Reptiles

A reptile survey of suitable habitats within the development footprint was carried out in September and October 2011 in accordance with best practice published guidance available at the time (28, 29). A total of 44 artificial refugia were distributed across the site and checked times in suitable weather conditions; the results are presented in **Table 11** and shown on **Map 6**.

Table 11: *Reptile survey results.*

Date	Time	Temp (°C)	Weather	Slow worm			Viviparous lizard		
				Male	Female	Juvenile	Male	Female	Juvenile
13 Sep	12:00	17	sunny spells	-	-	-	-	-	-
20 Sep	14:00	17	light breeze	-	-	-	-	3	-
23 Sep	11:30	18	sunny spells	-	-	-	-	-	-
4 Oct	14:30	18	cloudy	-	1	-	2	-	-
9 Oct	14:30	17	overcast	-	-	-	-	-	-
12 Oct	14:30	16	mild, clear	-	-	-	1	-	1

The survey recorded the presence of slow worms *Anguis fragilis* and viviparous lizards *Zootoca vivipara.* A full assessment of population size was not undertaken as it is not necessary for a development of this scale and the reptiles using the site are likely to be part of a larger population using habitat outside of the survey area. Both slow worms and viviparous lizards are UKBAP species, however the number of animals using the site is estimated to be low on the basis of the extent of the habitat available and therefore would be considered of **local value**.

3.9 Bats and Barn Owls

During the initial Ecological Scoping survey (1), habitat on the site was identified as potentially suitable for roosting bat and nesting barn owls *Tyto alba* in a derelict building within the former boatyard. However, since that survey was carried out this has been vandalised and as a consequence is no longer suitable for these species.

3.10 Summary of Ecological Baseline

All of the ecological features within the zone of influence considered to be local value or greater are presented in **Table 12**. The potential for the development to affect these features will be considered in **Chapter 4**.

Table 12: *Summary of Ecological Baseline. HR10 = Habitat Regulations, WCA81 = Wildlife & Countryside Act, NPPF = National Planning Policy Framework, HBCS = Havant Borough Core Strategy, WBGS = Waders and Brent Goose Strategy, UKBAP = UK Biodiversity Action Plan, HBAP = Hampshire Biodiversity Action Plan, HvBAP = Havant Borough Biodiversity Action Plan.*

Feature	Valuation	Legislation and Policy
Chichester and Langstone Harbours SPA/ Ramsar Site	International	HR10, NPPF, HBCS, WBGS
Solent Maritime SAC	International	HR10, NPPF, HBCS
Chichester Harbour SSSI	National	WCA81, NPPF, HBCS
Fields & Saltmarsh South of Copse Lane SINC	County	NPPF, HBCS
Other SINCs	County	NPPF, HBCS, WBGS
Grassland within Fields and Saltmarsh South of Copse Lane SINC	District	NPPF, HBCS, HBAP, HvBAP
Species-rich hedgerows	Local	NPPF, HBCS, UKBAP, HBAP, HvBAP
Coastal scrub with *Ramalina fraxinea*	Local	NPPF
Saltmarsh with sea lavender	County	HR10, HBCS, NPPF, UKBAP, HBAP, HvBAP
Annual glasswort beds and cord-grass saltmarsh	District/county	NPPF, HBCS, UKBAP, HBAP, HvBAP
Colony of golden samphire	Local	NPPF, HBAP
Eelgrass beds	National	HR10, NPPF, HBCS, UKBAP, HBAP, HvBAP
High tide roosts of brent goose and waders at Gutner Peninsula and Verner Common	International	HR10, NPPF, HBCS, WBGS,UKBAP, HBAP, HvBAP
Intertidal bird feeding areas	Local	HR10, WCA81, NPPF, HBCS, WBGS, UKBAP, HBAP, HvBAP
Feeding areas in Fields and Saltmarsh South of Copse Lane SINC	Local	NPPF, HBCS, WBGS, HBAP
Fish assemblage	Local	NPPF
Reptile assemblage	Local	WCA81, NPPF, UKBAP

4.0 IMPACT ASSESSMENT

4.1 Introduction

This chapter considers the likely ecological impacts (both positive and negative) of the proposals, in the absence of mitigation. The potential impacts are identified in reference to the likely biophysical changes associated with the scheme, as identified in **Chapter 2**. Only impacts to ecological features or resources identified within **Chapter 3** as being of local value or above are considered within this chapter (see **Table 12** for a list). In many cases, whilst a potential negative impact is identified at this stage, avoidance measures or mitigation can be implemented to ensure no residual negative impacts. Avoidance measures, mitigation measures to ensure that no significant impacts occur and ecological enhancements are detailed in **Chapter 5**.

Many of the likely biophysical changes identified in **Chapter 2** would affect more than one of the ecological features identified in **Chapter 3/Table 12** and many of the features overlap, for example damage to eelgrass beds would result in a loss of status of the SAC, affect the feeding of bird populations and therefore have a negative effect on the SPA/SSSI. Therefore, this chapter is organised by the type of potential impact as opposed to by ecological feature. Impacts identified as being potentially significant are summarised in **Table 13** at the end of the chapter.

4.2 Damage to Intertidal Habitats

4.2.1. Construction Damage

The proposed pontoon location on the creek will affect an area of approximately 267.5m^2 of intertidal habitats (by direct removal or indirect effects such as shading. (including boats up to 651.5m^2 would be affected). Although this area has potential as a wader and brent goose feeding site, have not been recorded using this area to any great extent. No dredging is proposed in association with the construction.

Within the area affected by the pontoon, the habitat is dominated by spiral wrack *Fucus spiralis* with occasional plants of horned wrack *F. ceranoides* and knotted wrack *Ascophyllum nodosum* (see **Figures 8** and **13**), all of which are common in the Solent and around British coasts.

To the east of the pontoon area are some more extensive areas of bare mud, which support beds of eelgrass in late summer (see **Figure 9**). The pontoon has now been reduced in length and positioned away from and north of the eelgrass beds, as identified by the current survey of eelgrass distribution and extent and therefore would not result in any direct physical damage or non-physical damage by shading the habitat.

Figure 13: Habitat at the location of the proposed pontoon is dominated by wracks and avoids areas of eelgrass.

Although the proposals will result in the loss of 267.5m^2 of intertidal habitat, the habitats affected are not considered of high ecological value, and the development avoids direct impacts to any habitats for which the Solent Maritime SAC is designated, in particular the eelgrass beds and saltmarsh habitats; the area affected is also little used by brent geese and waders.

The proposals also include the removal of existing sea defences and pontoons, which will make additional areas of intertidal habitat suitable for colonisation by marine algae and suitable for feeding birds, and will offset any habitat loss. These are shown on **Map 7** and include existing concrete coastal defences, areas of asphalt and disused metal pontoons which currently occupy a total of 918m^2 of intertidal area. Therefore the proposals would result in an increase of 650.5m^2 (366.5m^2 if the moored boats are considered) of intertidal habitat.

The proposed removal of a potential pollution source (the asphalt and other debris areas) may also improve the quality of the habitat by lessening any leaching of unknown substances. Therefore it is considered that the proposals would not result in significant damage to any intertidal habitats of local value or above or that are of value for feeding birds or the fish assemblage. Consequently, it is considered that there would be no significant impacts on Chichester and Langstone Harbours SPA/Ramsar Site, the Solent Maritime SAC and Chichester Harbour SSSI as a result of damage to habitats arising from the construction of the proposed development.

4.2.2. Operational Damage

The presence of boats moored on the pontoon will provide a further continuous disturbance to estuarine habitats and when moorings are fully utilised will cover an area of approximately 551.5m^2. Damage to habitats from boat moorings can occur due to swinging anchor chains as the tide rises and falls (see **Figures 10**, **11** and **12**). However, pontoon moorings offer a significant advantage over the traditional swing-mooring currently used within the vicinity, as the pontoon moorings will not move laterally with the tide. Therefore damage will be localised to the pontoon position, unlike with swing-moorings which can

cause significantly more widespread damage. Dredging or bottom levelling to maintain access will not be undertaken.

The pontoon has been positioned away from and north of the eelgrass beds, as identified by the current survey of eelgrass distribution and extent and therefore would not result in any direct physical damage or non-physical damage by shading the habitat. As all the additional boats using the creek would have a berth at the pontoon there would be no incidental mooring within the creek. The increase in the number of boats using the creek is very small therefore other potentially damaging such as the release of pollution and nutrients from boats using the creek would be negligible.

The other Annexe I SAC habitats (sea-lavender saltmarsh and glasswort communities), whilst adjacent the application site, are not directly or indirectly affected by the proposals and are therefore not considered likely to suffer any impacts from the Yachthaven development.

Therefore there would be no significant impact upon eelgrass beds or other Annex I habitats within the Solent Maritime SAC, Chichester and Langstone Harbours SPA/Ramsar Site and Chichester Harbour SSSI as a result of operational damage to habitats, nor would there be a significant impact on the conservation status of fish within the zone of influence.

4.3 Damage to Terrestrial Habitats

The development will only directly affect habitats within the former boatyard area, none of which are considered to be of value outside of the zone of influence; all habitats of local value or greater are to be retained. However, whilst this habitat is not proposed to be developed over, there is potential compaction impacts upon root structure and damage to canopy of hedgerow trees by large vehicles accessing the site during construction and while improving the sites access, which may result in die-back, disease and death of trees and shrubs where damage is extreme. Therefore it is considered that a **medium-level, medium-term adverse impact upon trees and hedgerows is likely**.

4.4 Disturbance of Birds

4.4.1 Construction Disturbance

During construction, particularly activities such as pile-driving the pontoon and sea defence, it is possible that noise and vibration could cause localised disturbance of brent geese and waders, but only if close to the development site. Based on the survey results and WeBS data, only low numbers of birds use parts of the creek and terrestrial habitat within close proximity of the site. Experience from monitoring work carried out by the authors in other parts of the Solent suggests that Brent Geese are not bothered by low to medium level noise (e.g. Tipner Rifle Range in Portsmouth is used by brent geese, 18). In general, it is well known that waterfowl are only disturbed by sudden loud noises caused by gunfire or, for

example, pile-driving activities but usually become accustomed to other forms of noise and vibration.

Disturbance from construction noise could only occur during the winter period when geese high numbers of waders and other wildfowl are present and only when they are in close proximity to the development. The results of the winter bird survey indicate that the parts of the creek close to the development site are used only by low numbers of wintering waterfowl during low tide counts. Although a large quantity of *Zostera* was available to the geese, significant numbers and therefore significant disturbance of brent geese and waders feeding in intertidal habitat is considered unlikely.

The Fields and Saltmarsh South of Copse Lane SINC (which includes the adjacent fields to the north, forming parcel H56), appears to be rarely used by small numbers of brent geese and there are no wader records (although it is acknowledged that this may partly be due to under-recording). The site has already been designated as SINC on the basis of Brent Goose use, following the 2002 Brent Goose Strategy (18). It is possible that any birds using the coastal meadow would be disturbed by noise and human activity from site construction, but the northern fields are well screened by hedges and mature trees and would be unaffected. It is not known which parts of the site have been used by Brent Geese in the past; however, it is equally likely that birds feeding within the creek have moved on to the coastal meadow for short periods, or may have fed in the large field immediately to the north of the meadow, which has an enriched-improved sward.

The construction of coastal structures, works to the slipway, removal of concrete sea defences, construction of the boat user facilities and landscaping close to the foreshore could cause disturbance to wildfowl roosting on the adjacent Verner Common, if conducted during the winter period; albeit temporary in nature. Therefore a **low-level, temporary, short term impact to brent geese roost at Verner Common and feeding at Fields and Saltmarsh South of Copse Lane SINC is 'unlikely'** and would only affect low numbers of birds. However, when Chichester Harbour is considered as a whole, this is not likely to be significant and therefore no impacts to Chichester and Langstone Harbours SPA/Ramsar Site are likely.

4.4.2 Operational Disturbance

The proposals will result in an increase on anthropogenic disturbance sources in the form of increased human presence on the shore and increased boat traffic within the creek.

Disturbance from Boat Traffic

The increase in boat traffic will be very small, with a total of 12 berths, which is likely to result in a small increase in boat traffic within the creek. The berths would be associated with the new dwellings or privately/owned rented by leisure users. Therefore few boat movements are anticipated during the winter months during periods of high use by wildfowl. During late summer when waterfowl start congregating in the Solent there will be a greater, although still unlikely, chance of disturbance with more boat movements. The types of vessel likely to use the new pontoon are unlikely to be suitable for landing illegally at high-tide roosts, such as Gutner Peninsula.

The creek is navigable for only 2.5 hours either side of high tide when birds are generally in high tide roosts as opposed to feeding within the intertidal zone. Therefore, disturbance from vessels would potentially affect the internationally important roosts at Verner Common and Gutner Peninsula, which are used primarily during the winter months. Boats travelling up the middle of Yachthaven creek will be over 60m from key roost sites on Gutner Peninsula and over 100m from Verner Common. The disturbance investigation conducted using a RIB travelling at 8 knots (the proposed speed limit within the creek) demonstrated negligible bird disturbance, with no major disturbances taking place as a direct result of the boat movement, during four passes between 50m and 100m of the high-tide roosts (24).

Although the increase in boat movements is likely to be small, it is not possible to quantify and therefore it is considered that a **short-duration, low-level impact which would could affect the integrity of Chichester Harbour SPA/Ramsar Site and conservation status of Chichester Harbour SSSI is 'unlikely'**.

Disturbance from Increased Human Activity on the Shore
The development will result in increased human activity within zone of influence from residents of the six dwellings to be constructed. This may affect the low numbers of birds feeding in the intertidal habitats.

Residents of the new dwellings are likely to utilise the coastal footpath located on the foreshore of Yachthaven, for recreational activities such as walking, running and dog-walking. Although the footpath along the foreshore of Yachthaven is proposed for restoration, it is currently passable and safe to use. Therefore, its restoration is not likely to result in an increase in recreational users. The footpath does not run directly adjacent to the key high-tide roosts (Verner Common and Gutner Peninsula) and consequently an increase in disturbance of birds using these areas is considered unlikely. However, it does pass adjacent to intertidal feeding habitat. The bird field survey and WeBS data revealed little use of this area by waders and brent geese. The creek at this point is less suitable for low-tide feeding, on account of its narrow, enclosed shape and lower quality habitat dominated by larger seaweeds and without any extensive muddy areas preferred by most species of waders. At certain times of the year, such as during harsh winter periods, the creek may become more important as a feeding site on account of its sheltered location and it is also possible that the creek may be used by more feeding birds during late summer before the eelgrass dies off.

During the bird surveys disturbance was recorded when in the form of dog-walkers present for a relatively brief and two horse-riders observed on Verner Common on this date. During this visit there were very high numbers of brent geese feeding in the creek but only slight disturbance witnessed from one dog-walker, which caused some geese feeding close to the shore to walk further out onto the mudflat.

Due to this increase in human presence there may be a seasonal but low level effect upon low-tide feeding birds within the creek, particularly during late summer when brent geese are feeding on the eelgrass beds. During harsh weather, when waders may be more inclined to visit the creek, human activity on the foreshore and in boats moored at the pontoon will be less and thus this negative impact is also expected to be insignificant. Overall, a **low-level,**

temporary impact is 'unlikely' to brent geese and waders feeding in the intertidal zone, which would affect only low numbers of birds. This however, is not considered significant across Chichester Harbour as a whole and therefore no significant impacts to Chichester and Langstone Harbours SPA/Ramsar Site and Chichester Harbour SSSI are considered likely.

Disturbance of Birds Using Habitat Inland

Residents of the new dwellings could utilise the landward footpath, through the middle of the Fields & Saltmarsh South of Copse Lane SINC (and Brent Geese and Wader Strategy (5) site H56) or the footpath along the foreshore south of the SINC (and within the SINC). This could result in disturbance of feeding and roosting birds, particularly if people or dogs leave the footpath and enter the site. A number of other sites near to Yachthaven do not appear to be used by brent geese or waders and no impacts to these sites are likely. Most of the surrounding land consists of improved to semi-improved closely grazed horse pasture and is enclosed by high hedgerows with frequent mature trees. Some of the larger fields have potential to be used by waders such as curlew, but are clearly unsuitable as feeding sites for brent geese.

In isolation, the disturbance to feeding sites identified within the Strategy (5), particularly Fields and Saltmarsh South of Copse Lane SINC, due to increased human activity as a result of the proposed development, is considered to be an **'unlikely,' low-level, infrequent impact**, this however would only affect very low numbers of birds and would not affect the integrity of Chichester and Langstone Harbours SPA/Ramsar Site.

4.5 Coastal Squeeze

The proposed pontoon will now not include the previously proposed retaining wall, which would have covered approximately 100m^2 of the creek bank. Instead the access slipway on to the pontoon from the land will if required be re-positioned if natural erosion processes dictate.

4.6 Impacts to Reptiles

If slow worms or viviparous lizards are present within the construction area at the time of site clearance it is possible that individual animals could be killed or injured by machinery. If significant numbers of reptiles are affected this could reduce the viability of reptile populations in the local areas, leading to a reduction in conservation status. However, the survey only recorded low numbers of reptiles within affected areas and only a relatively small proportion of the total habitat resource within the zone of influence will be affected. Consequently, the number of reptiles affected is likely to be small and populations are likely to recover. When considering the magnitude of potential impacts to reptiles it should be noted that the existing reptile habitat on the site is becoming increasingly scrub-covered (see **Figures 3** and **4**) and therefore, without intervention, the site will become considerably less suitable for reptiles in the medium to long-term. Therefore the proposals are considered

to have a **low,-level medium-term, reversible adverse impact on reptile populations** within the zone of influence.

4.7 Summary of Impacts

Table 13 summarises the significant potential ecological impacts of the proposed development; mitigation for these is presented in **Chapter 5**. The proposals are not predicted to have any significant impacts upon the Solent Maritime SAC.

Table 13: *Summary of significant impacts*

Feature	Impact	Magnitude	Duration, frequency and permanence	Certainty
Chichester and Langstone Harbours SPA/Ramsar Site	Disturbance of brent geese and waders roosting at Verner Common and Gutner Peninsula	Low	Short-term infrequent reversible	Unlikely
Chichester Harbour SSSI	Disturbance of brent geese and waders roosting at Verner Common and Gutner Peninsula	Low	Short-term infrequent reversible	Unlikely
Fields & Saltmarsh South of Copse Lane SINC	Disturbance of feeding and roosting brent geese	Low	Short-term infrequent reversible	Unlikely
Species-rich hedgerows	Crown damage and root compaction during construction	Medium	Medium-term infrequent reversible	Likely
High tide roosts at Gutner Peninsula and Verner Common	Disturbance of roosting waders and brent geese	Low	Short-term infrequent reversible	Unlikely
Intertidal bird feeding areas	Disturbance of feeding waders and brent geese during construction	Low	Short-term infrequent reversible	Unlikely
Reptile populations within the development area	Loss of habitat and risk of killing and injury of individual animals	Low	Medium-term infrequent permanent	Certain

5.0 AVOIDANCE, MITIGATION, COMPENSATION AND ENHANCEMENT

5.1 Introduction

In order to ensure and to comply with relevant planning policy and nature conservation legislation (as detailed in **Chapter 1** and **Chapter 3**) it is necessary to mitigate for any adverse impacts that might occur as a result of the proposed redevelopment. **Chapter 4** has identified potential significant adverse impacts as a result of the proposed development at Yachthaven upon features of ecology and nature conservation interest in the absence of mitigation (see **Table 13**). Proposed avoidance and mitigation for these impacts is presented below, in addition measures that will adequately compensate for impacts which cannot be avoided or mitigated and details of proposed ecological enhancements are also provided. The mitigation is summarised in **Table 14**.

5.2 Measures to Avoid Disturbance of Birds

5.2.1 Construction Disturbance

The potential for feeding and roosting brent geese and waders in the intertidal zone and high tide roosts at Verner Common and Gutner Peninsula has been identified. It is possible to avoid these impacts through a number of measures:

1. Construction works to the foreshore and within the creek (including any piling) will not take place between late autumn and early spring, (late October to March) as this will avoid the period when majority of important bird species use Chichester Harbour and therefore no disturbance will occur.

2. Construction works within the creek will be carried-out using specialist non-vibration equipment.

3. Screens will be provided where human activity and works are likely to disturb birds, such as brent geese roosting and feeding on Fields and Saltmarsh South of Copse Lane SINC or waders and geese feeding in the creek.

By carrying out activities with a high likelihood of disturbance outside of the period when the majority of bird species are present, it will be possible to avoid any significant disturbance of birds due to construction; additional measures such as screening will prevent disturbance of birds feeding in the intertidal zone and Fields and Saltmarsh South of Copse Lane SINC during the winter. Implementation of these measures would reduce the likelihood and severity of any disturbance to an insignificant level.

5.2.2 Operational Disturbance

The potential for the boat users to disturb important high-tide brent goose and wader roosts at Verner Common and Gutner Peninsula has been identified by increased traffic during the

winter months. In order to prevent this, the rental/purchase agreement for berths at the pontoon will include a restriction of one inward and one outward movement per vessel per month between the winter period late November to end of February. This would allow the number of additional boat movements within the creek to be quantified and restricted to an insignificant level.

Although illegal landing at Gutner Peninsula and Verner Corner is unlikely, the rental/ purchase agreement would also include clauses to prevent disturbance elsewhere within the creek, especially within the vicinity of these areas.

In addition to these clauses signs will be attached to channel marker posts adjacent Gutner Peninsula and Verner Common, with wording to the effect: '*Private, Protected Area, No Landing'*. This would reduce the likelihood of any additional users of the creek from landing at the high tide roost site to an insignificant level and the addition of the warning signs may also deter current users of the creek from landing. Currently there are no such measures to deter landing at these sites and therefore this would reduce any potential disturbance of the high tide roosts at Verner Common and Gutner Peninsula to an insignificant level and potentially to less than existing levels.

This potential for disturbance of feeding or roosting birds at the Fields and Saltmarsh South of Copse Lane SINC has been identified. The survey data and incidental observations indicate that currently there is very low level of human activity along the coastal footpath and although this may increase, any increase is likely to be small. A stock netting fence will be erected on the landward side of the coastal path adjacent Fields and Saltmarsh South of Copse Lane SINC to deter people and prevent dogs from entering the site. This will confine human presence to the perimeter of the site and minimise any disturbance to insignificant levels.

5.3 Protection and Enhancement of Eelgrass Beds

Although no significant impacts to the eelgrass beds are considered likely, in order to raise awareness of existing and new boat users, an '*Eelgrass Code of Conduct*' (see **Appendix 6**), similar to codes in operation in Studland Bay in Dorset (30) and Tor Bay in Devon (31) would be created for all users of the new pontoon. This would contain clauses to prevent anchoring within the creek, speeding through shallows and discharging waste within the creek. As all additional traffic within the creek will be associated with the new dwellings and rented/purchased pontoon moorings, this code would be much more enforceable than if it applied to general public use and therefore is considered to have a high likelihood of success. In addition the '*Eelgrass Code of Conduct*' will be placed on view at the boat facilities building detailing location of eelgrass beds within the Yachthaven Creek and the ecological significance.

Existing swing-moorings are currently causing damage to eelgrass beds within the creek, potentially leading to increased fragmentation of the beds (see **Section 3.5.6** and **Figures 9**, **10**, **11** and **12**). It is proposed that no new licences for swing-moorings are granted by the

Chichester Harbour Conservancy and existing licences reviewed. This would reduce the overall level of damage from moored boats within the creek and therefore reduce the negative impacts of the development upon eelgrass beds to an insignificant level, and may in fact have a positive impact. It is understood that all swinging moorings are subject to agreement and licensing by the Chichester Harbour Conservancy.

5.4 Protection of Trees and Hedgerows

The potential for locally important trees and hedgerows to be damaged as a result of crown damage and root compaction during construction has been identified. In order to prevent this, standard arboricultural tree protection measures will be implemented including the fencing off of a root and crown protection zone to prevent access by machinery. These measures would ensure damage to the trees and hedgerow would be extremely unlikely.

5.5 Protection of Reptile Populations

The presence of low numbers of slow worms and viviparous lizards has been identified within the development area, which could be killed or injured during site clearance; the development would also result in the loss of reptile habitat. In order to mitigate impacts to reptiles it is proposed that animals would be captured from within the development area and relocated in an area of suitable habitat created in another part of the site (see **Section 5.6** for further details). This would involve fencing affected areas of the site with reptile exclusion fencing, distributing artificial refugia across the site from which reptiles can be captured (as per the survey methodology described in **Section 3.8**) and then released into newly created habitat. This relocation would comply with best practice guidance (at the time of writing Natural England have withdrawn the recently published reptile mitigation guidelines (32), but it is expected that these would be available by the time any relocation would take place).

Currently, reptile habitats on the site are becoming increasingly scrub-covered (see **Figures 3** and **4**) and therefore, without intervention, the site would become considerably less suitable for reptiles in the medium to long-term. The proposed habitat creation (**Section 5.6**) and subsequent management would ensure the long-term presence of habitat suitable for reptiles on the site. Prior to any relocation starting, a reptile mitigation strategy including details of the capture and relocation and habitat creation and management would be produced, which, if followed would ensure there would be no significant impacts to reptiles within the zone of influence, and may have a positive impact in the medium to long-term.

5.6 Habitat Enhancement Within the SPA/SAC/SSSI

In addition to the removal of sea defences described in **Section 4.4**, other small-scale environmental improvements are planned within the vicinity of the site which will include

the removal of asphalt on the foreshore of Yachthaven, which will remove a potential pollutant from the shoreline of the SAC.

5.7 Habitat Creation and Management

5.7.1 Yachthaven Nature Reserve

Within the application site, two areas are proposed for the creation and management of features of high ecological value. The aim of the 'Yachthaven Nature Reserve' is to provide long-term management of existing and created coastal grassland and to provide alternative high quality reptile habitat and mitigate the impacts of future coastal squeeze. The nature reserve is split into two parcels of land either side of the boat storage and pontoon facilities, with 'Yachthaven Coastal Meadow' to the west covering approximately 1ha of coastal grassland SINC, having become encroached with dense scrub and 'Yachthaven Conservation Grassland' to the east, covering 0.2-0.3ha of currently disturbed (formerly enriched scrub, tall herbs and grassland) with no current designation.

Management recommendations for the Coastal Meadow and Wetland will include a botanical survey to highlight sensitive areas; a small amount of restoration and on-going management of scrub. The Conservation Grassland will include extensive restoration and ground-works; very limited soft-landscaping; and on-going management of grassland areas. Both areas will create soft habitats that may help mitigate the effects of coastal squeeze in the event of future sea level rises.

It is anticipated that the Yachthaven Nature Reserve will be managed and monitored by a suitable conservation land management organisation to carry out monitoring and management of the wetland and grassland conservation areas.

5.7.2 Yachthaven Coastal Meadow and Wetland

The key features which Yachthaven Coastal Meadow and Wetland will seek to protect and enhance are:

- Unimproved coastal grassland
- Reptile habitats
- Scrubland bird-nesting species

Currently, the grassland is becoming increasingly scrub-covered (see **Figures 3** and **4**) which is leading in a reduction in the quality of the unimproved grassland sward. Areas of grassland which have not been colonised with scrub include varying sward structures with tightly rabbit-grazed grassland in the central area and areas of taller, rough taller matted grassland along the southern shoreline adjacent to the Yachthaven Creek. A slight depression in the grassland, likely results in regular winter waterlogging in this area. There is

further evidence to show that there is a saline influence due to the presence of *Salicornia* spp.

A detailed botanical survey was undertaken during May & June 2012 to assess the value of the grassland and determine the distribution of any sensitive species-rich areas. This has been used to inform the following measures, which will be undertaken to maintain and enhance the quality of the site as part of a Management Plan:

- A habitat assessment for reptiles will be undertaken to identify and safeguard any areas of higher quality habitat.
- Areas of scrub will be removed to increase the extent of the grassland and improve the site for a number of species and groups. The long-term management plan should allow for no greater than 30% coverage of varying ages of scrub species over the entire grassland.
- Bushes supporting lichen communities of local value close to the foreshore will be retained within the site, and during the scrub clearance, a group of two to three hawthorn bushes will be retained every 20m to allow colonisation by notable lichens. Retained hawthorns along the foreshore will also provide some screening to minimise disturbance from human activity along the footpath. Additional native hedgerow plants will be planted to screen the boatyard.
- To minimise general human disturbance within the Yachthaven Coastal Meadow, a suitable specification fence such as stock fencing and top rail will be installed along the boundary with the coastal path to prevent access by humans and dogs.
- Reptile and invertebrate hibernacula and basking areas will be created.
- A barn owl nesting box will be erected either on a suitable tree or poll in a suitable area of the grassland.
- 10 in number bird boxes and bat boxes of various specification will be erected in suitable trees on site. These will include both open fronted and circular entrance bird boxes, wooden and Schwegler bat boxes.

Although the area is presently grazed by rabbits some management will likely be required to prevent succession of the grassland to encroachment to scrub this will be prescribed in a prepared management plan.

5.7.3 Yachthaven Conservation Grassland

Much of this area comprises recently cleared bramble scrub (see **Figure 2**) strewn with industrial and building wastes, which currently contains contaminated spoil. A hawthorn hedge is located along the eastern boundary and the gravel public footpath is situated along the southern and south-western shoreline boundary. On the northern boundary the bramble dominated vegetation continues into areas of existing derelict buildings and hardstanding.

The primary aims of the Yachthaven Coastal Grassland are to create a floristically diverse grassland of value for invertebrates and to provide optimal habitat for reptiles, to offset habitat losses within the site and accommodate relocated animals.

The habitat creation and management brief for the Conservation Grassland is shown on **Map 8** and will include the following:

- Clearance of existing bramble scrub vegetation and removal of contamination and waste materials across the area.
- Re-levelling and contouring of ground levels to include depressions to provide diversity and creation of micro-habitats. Importing of suitable soils if required .
- Construction of reptile and invertebrate hibernacula and basking areas.
- Existing hedgerow will be strengthened and widened by planting appropriate local provenance whips.
- The area will be seeded with appropriate coastal grassland mix, ideally using seed collected from the adjacent coastal grassland and other sites on Hayling Island, using a forage harvester or similar machinery. Alternatively a reputable stockist such as such those listed by Flora Locale (33) could be used to supply seed.
- The Conservation Grassland will be enclosed with a fence to the same specification of the boundary fencing of 'Yachthaven Coastal Meadow & Wetland' to restrict public access and prevent dogs from entering the area.

The wildflower meadow will require regular management to prevent succession to scrub. The principal means of maintain the quality of the meadow habitats would be for annual mowing to be carried out at the end of the flowering season (late summer) to allow wildflowers to set seed. This mowing regime will include different areas of the meadow being mown at various heights. This will promote a varied plant diversity and physical structure within the sward. All cuttings will be collected but will be composted in a suitable area of the grassland to provide possible breeding and sheltering areas for reptiles, small mammals and amphibians.

5.8 Supervision

Due to the sensitive location of the site and the extent of mitigation and enhancements proposed, it is recommended that an Ecological Clerk of Works (ECoW) is appointed to oversee mitigation, construction phases, as well as during and post construction monitoring. The ECoW should provide an annual progress report to both the Chichester Harbour Conservancy and owners of the pontoon and nature reserve.

5.9 Summary of Mitigation

It is considered that the full implementation of all avoidance, mitigation and enhancement measures detailed within this chapter would ensure the proposed development would not result in any significant impacts to any features of ecological interest, including the Solent Maritime SAC, Chichester and Langstone Harbours SPA/Ramsar Site and Chichester Harbour SSSI. Accordingly, it is concluded that the proposed development at Yachthaven would comply with the planning policy and nature conservation legislation detailed in **Section 1.5**

and **Table 12**. A summary of the mitigation and how it addressed the significant impacts identified in **Chapter 4/Table 13** is provided in **Table 14**.

Table 14: *Summary of mitigation.*

Feature	Impact	Mitigation	Outcome
Chichester and Langstone Harbours SPA/Ramsar Site	Disturbance of brent geese and waders roosting at Verner Common and Gutner Peninsula	Restriction of boat movements during the winter months. Clauses in the berth rental/purchase agreement and signage to prevent landing on important high tide roost areas	No impact likely
Chichester Harbour SSSI	Disturbance of brent geese and waders roosting at Verner Common and Gutner Peninsula	Restriction of boat movements during the winter months. Clauses in the berth rental/purchase agreement and signage to prevent landing on important high tide roost areas	No impact likely
Fields & Saltmarsh South of Copse Lane SINC	Disturbance of feeding brent geese	Habitat enhancement measures, fencing and screening of the site to prevent public access, timing of construction to avoid periods when geese may use the site	Positive impact
Species-rich hedgerows	Crown damage and root compaction during construction	Standard tree protection measures	No impact likely
High tide roosts at Gutner Peninsula and Verner Common	Disturbance of roosting waders and brent geese	Restriction of boat movements during the winter months. Clauses in the berth rental/purchase agreement and signage to prevent landing on important high tide roost areas	No impact likely
Intertidal bird feeding areas	Disturbance of feeding waders and brent geese during construction	Timing of works to avoid time of year when most birds are in the vicinity, screening of site from important bird areas	No impact likely
Reptile populations within the development area	Loss of habitat and risk of killing and injury of individual animals	Habitat creation in Yachthaven Coastal Grassland and relocation of reptiles from within the development area	Slight positive impact

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APPENDIX 1: CONSULTATION RESPONSES

Natural England (Thomas Schindler) Response to Ecological Scoping Report 18 March 2011

I've had a quick look at the documents you sent me and I have the following comments to make. Firstly I think Ed has touched upon most of the relevant environmental issues that need to be considered for this application, however, there are a few other issues that will need further assessment.

Firstly, due consideration will need to be given to the Area of Outstanding Natural Beauty (AONB). I suggest you consult with the Harbour Conservancy regarding this issue. Furthermore, it is my understanding that there is a moratorium on any new moorings/pontoons. I understand that this is an old boat yard, but the existing infrastructure has long gone and what is being proposed is new maritime infrastructure. I would not call this a replacement of like for like and I do not see how the Harbour Conservancy will allow this – though, I am not familiar with the ins and outs of their policy. Anyway best to speak to them regarding this issue.

The rest of my comments are in regards to the SAC/SPA/Ramsar. Reading the report, I did not see any reference made to estuary function and process. Chichester Harbour itself is 1 of the 8 physiographic unique estuaries specifically identified as part of the wider SAC designation. An assessment will need to me made with regards to whether or not the structures and any associated dredging requirements will impact estuary function. Speaking of dredging requirements, if there is any dredging associated with the works, an assessment will need to be made with regards to the sediment budget and associated impacts to the intertidal habitat.

It's very important to determine whether or not the area of habitat to be developed on is currently utilised by SPA birds. If so, then an appropriate area of mitigation habitat will need to be identified. This needs to be a like-for-like replacement. Providing other environmental enhancements (such as a nature reserve) whilst a good thing, will not necessary satisfy the Habitat Requirements.

With regards to the SAC habitat, we will need to be provided with a quantification of the area of habitat lost/made unavailable to birds as well as a qualification of the mitigation habitat. For instance we would need to know how much and what type of habitat is recovered from the removal of redundant structures and sea defences. This will be a key issue for you to address (regardless of bird disturbance), as one of the conservation objectives for the harbour is no loss of extent for the saltmarsh and intertidal mud.

Lastly, it looks as if you got the disturbance issue well in hand and that it is understood that further surveys are necessary to get a better handle on how the birds utilise the site and thus what the potential impact may be. This is a tricky area to address and it may be that further discussions will be necessary, depending on what the surveys/results indicate. Voluntary codes of conduct may not be enough to offset impact, as by their very definition they are only voluntary and not a managed requirement. Only until we have further information on bird usage and behaviour can Natural England provide further comments.

As a side note, I wonder if the opportunity for a small realignment near the proposed nature reserve has been explored in any detail? Such a realignment/habitat creation could go a long way in providing habitat mitigation as well as potentially providing for estuary function mitigation. In the long term, this may be more sustainable and will provide an area for the intertidal to move to as sea levels rise.

Hope these comments have been useful and I look forward to seeing the full assessment and ecological report.

Regards

Tom

Natural England (Simon Thompson) Response to Ecological Assessment Report 24 August 2011

Thank you for sending through the Ecological information regarding the proposed Yachthaven development at Hayling Island. Please accept my apologies for the delay in responding, but I wanted to liaise with my marine colleagues to ensure you had an accurate response.

I should point out Natural England are happy to provide informal comments, but these are without prejudice to any future comments we may make to a formal planning application.

Bird Disturbance - we believe the information provided on use by birds is potentially an underestimate based on both the timings of the surveys and the comments made by Ed Rowsell who is familiar with the area. I believe there is a risk that recreational disturbance is an issue when taken in-combination with other developments and activities across the Solent European Marine Site, hence the Solent Disturbance & Mitigation Project. A more comprehensive understanding of the use of the area would be likely to be required in order to assess the development against the Habitats Regulations.

Eelgrass beds - No survey was undertaken to provide a detailed understanding of the extent and status of the eelgrass beds within the area. Existing information suggests there are eelgrass beds in close proximity to the site and that the beds are in decline suggesting that the natural extent of eelgrass could/ should be greater. More information is required as with bird use in the above bullet-point.

Coastal squeeze - This is a widespread concern across the region which directly impacts intertidal substrates, the habitats and the communities they support. More information required.

Dredging - Doesn't appear to be much information on future dredging requirements to maintain access, this would have an impact on the designated site and will need to be included in any planning application.

I hope the above information is useful in assisting you to complete your submission to the Local Planning Authority, but if you wish to discuss further please do not hesitate to contact me.

Best regards,

Simon

APPENDIX 2: DETAILS OF SINCS WITHIN THE ZONE OF INFLUENCE

SINC Ref	SINC Name	Central Grid Ref.	SINC Criteria	Species supported that meet Section 6 of SINC Selection Criteria	Area (ha)
HV0087	Verner Common West	SU72350145	6B	Branta bernicla bernicla (Dark-Bellied Brent Goose) [UKBAP]	9.91
HV0088	West of North Hayling V	SU72400190	6B	Branta bernicla bernicla (Dark-Bellied Brent Goose) [UKBAP]	4.25
HV0096	Fields & Saltmarsh South of Copse Lane	SU72730188	4A/6B	Branta bernicla bernicla (Dark-Bellied Brent Goose) [UKBAP]	7.19
HV0098	North Copse, Havant	SU72840213	1A		0.69
HV0102	West of North Hayling P	SU73000263	6B	Branta bernicla bernicla (Dark-Bellied Brent Goose) [UKBAP]	9.50
HV0108	Gutner Farm	SU73430206	6B	Branta bernicla bernicla (Dark-Bellied Brent Goose) [UKBAP]	11.68

APPENDIX 3: HWT SOLENT WADERS AND BRENT GOOSE STRATEGY SITES DATA

H51 - Verner Common west fields (Brent Goose: Important, Waders: Uncertain)

There are six records for Brent Goose, five for a 4-day period in January 2007 when between 100 and 1200 birds were present (in addition to one no-count). There is a further record of 33 birds in February 2009. Waders recorded from the site comprise Curlew (maximum 1), Lapwing (8) and Redshank (144); these were largely roosting birds.

H55 - Field west of Yachthaven Coastal Meadow (Brent Goose: not included, Waders: Uncertain)

There are no Brent Goose records for this site and one negative record for waders (when the site was checked but no birds were present).

H56 - Yachthaven Coastal Meadow and fields to north (Brent Goose: Uncertain, Waders: Uncertain)

For Brent Goose, there are two records of 33 and 12 birds on dates in January and February 2007. The site was checked for waders on five occasions between November 2008 and February 2009, when none were recorded. It can be presumed that Brent Geese were also not present on these dates. It is not known whether the records refer to birds feeding in the coastal meadow or the fields to the north.

H57 - Fields to north and east of Yachthaven (Brent Goose: Uncertain, Waders: Uncertain)

There is a single Brent Goose record of 27 birds on 24 January 2007 and two negative records for waders (and geese) on later dates.

H58C - Gutner Peninsula field (Brent Goose: Uncertain, Waders: Uncertain)

The only record of Brent Goose is 90 birds feeding on 21 February 2007. There are no records of waders (two negative records).

H58D - Fields north of Gutner Peninsula (Brent Goose: not included, Waders: Uncertain)

There are two negative records for waders.

H78 - Gutner saltmarsh (Brent Goose: Important, Waders: Important)

There are 12 records of Brent Goose, ranging from 42 to 1300 birds. Maximum counts for waders are: Bar-tailed Godwit 400; Black-tailed Godwit 250 (though mostly much lower); Curlew 700; Dunlin 5000; Golden Plover 600; Greenshank 4; Grey Plover 700; Knot 2000; Lapwing 255; Oystercatcher 110; Redshank 320; Snipe 5; Turnstone 28 and Whimbrel 4. Most records are of roosting birds.

H79A - Verner Common saltmarsh (Brent Goose: Important, Waders: Important)

There are eight Brent Goose records, including one negative count and others ranging from 130 to 400 birds. Maximum counts for waders are: Black-tailed Godwit 11; Curlew 170; Dunlin 200; Golden

Plover 250; Grey Plover 300; Knot 15; Lapwing 420; Oystercatcher 100; Redshank 90; Snipe 3 and Turnstone 10. Most records are of roosting birds.

H79B - Verner Common scrub (Brent Goose: Uncertain, Waders: Uncertain)

There is a single record of Brent Goose, of 44 birds feeding on 26 February 2009. Wader records include counts of Curlew on two occasions (max. 280), and single records of 130 Grey Plover, 21 Lapwing and 9 Redshank.

H89 - Verner Common east field (Brent Goose: Uncertain, Waders: Uncertain)

There is a single record of Brent Goose, of 75 birds feeding on 22 November 2007. For waders, the records comprise a count of 80 Curlew on 20 January 2007 and 250 Golden Plover on 18 October 2008.

Information shown on Map 4.

APPENDIX 4: PLANT SPECIES LISTS

Species recorded for the study area, including the proposed development site, Yachthaven Coastal Meadow SINC and adjacent saltmarsh within the creek. Surveys carried out by J. Norton and D. Allan, with main recording visits on 16 February 2011 and 31 May 2012 (additional visits 4 March 2011 and 24 April 2012).

Names follow Stace's *New Flora of the British Isles* 2nd Edition (3rd Edition recent name changes in brackets).

Indicator column: W = species associated with ancient semi-natural woodlands (ancient woodland vascular plants); M = species associated with semi-natural grassland and meadows, usually having a long history of traditional management (includes species listed on HCC recording card and some additional conservation-worthy species).

Freq: (estimated relative abundance and frequency over site): D = dominant, A = abundant, F = frequent, O = occasional, R = rare, L = locally, P = present (frequency not possible to estimate - inconspicuous species, etc.).

Comments on habitat: 'ruderal' refers to species mainly occurring on the disturbed ground within the application site, including the longer established areas of dry gravel and hardstanding around the boatyard as well as the more recently disturbed areas; many of these species have recently colonised the site, though some are also species of semi-natural habitats. Species in bold are nationally scarce, county notable (rare or scarce) species, species listed in local BAPs or otherwise of conservation importance (see text for further details).

Species	**English name**	**Ind.**	**Freq.**	**Comments on habitat, etc.**
Ferns				
Polystichum setiferum	Soft Shield-fern	W	R	Hedgerow
Grasses, rushes & sedges				
Agrostis capillaris	Common Bent		LF	Semi-natural grassland
Agrostis stolonifera	Creeping Bent		P	Probably abundant in damp semi-natural grassland.
Anisantha sterilis	Barren Brome		F	Ruderal
Anthoxanthum odoratum	Sweet Vernal-grass		LF	Semi-natural grassland
Brachypodium sylvaticum	False Brome		O	Hedgerows, etc.
Bromus hordeaceus	Soft-brome		P	Ruderal
Bromus racemosus	**Smooth Brome**		**R**	**Semi-natural grassland**
Carex divisa	**Divided Sedge**		**R**	**Small patch in brackish grassland**
Carex divulsa	Grey Sedge		R	Hedgerows, etc.
Carex flacca	Glaucous Sedge		LF	Semi-natural grassland
Carex hirta	Hairy Sedge		F	Semi-natural grassland, etc.
Carex otrubae	False Fox-sedge		O	Wet, disturbed areas
Carex ovalis (Carex leporina)	Oval Sedge		R	Damp, disturbed ground
Carex pendula	Pendulous Sedge	W	R	Disturbed ground (garden origin)
Carex spicata	Spiked Sedge	G	R	One plant colonised disturbed ground, but usually in semi-natural grassland
Catapodium rigidum	Fern-grass		R	Ruderal
Dactylis glomerata	Cock's-foot		F	Ruderal
Elytrigia atherica	Sea Couch		LF	Upper foreshore
Elytrigia repens	Common Couch		LF	Old tipped soil, etc.
Festuca arundinacea (Schedonorus arundinaceus)	Tall Fescue		O	Various
Festuca rubra	Red Fescue		A	Various

Species	English name	Ind.	Freq.	Comments on habitat, etc.
Holcus lanatus	Yorkshire-fog		F	Mainly in semi-natural grassland
Juncus bufonius	Toad Rush		P	Bare mud
Juncus conglomeratus	Compact Rush		O	Damp, semi-natural grassland
Juncus gerardii	Saltmarsh Rush		LA	Brackish grassland
Juncus inflexus	Hard Rush		O	Wet, disturbed areas
Juncus maritimus	Sea Rush		LF	Clumps on upper foreshore
Lolium perenne	Perennial Rye-grass		F	Various
Luzula campestris	Field Wood-rush		O	Semi-natural grassland
Parapholis strigosa	Hard-grass		R	Dry ground, coastal path
Poa angustifolia	Narrow-leaved Meadow-grass		P	Ruderal
Poa annua	Annual Meadow-grass		F	Mainly on coastal path
Poa humilis	Spreading Meadow-grass		O	Semi-natural grassland
Poa infirma	**Early Meadow-grass**		**LF**	**Coastal paths**
Poa trivialis	Rough Meadow-grass		F	Various
Puccinellia maritima	Common Saltmarsh-grass		LA	Saltmarsh
Spartina anglica	Common Cord-grass		LA	Saltmarsh
Vulpia bromoides	Squirrel-tail Fescue		F	Short turf, coastal path
Herbs				
Achillea millefolium	Yarrow		R	Semi-natural grassland
Aegopodium podagraria	Ground-elder		R	Ruderal
Agrimonia eupatoria	Agrimony		O	Semi-natural grassland
Ajuga reptans	Bugle		R	On disturbed ground; likely to be of garden origin.
Alisma plantago-aquatica	Water-plantain		R	Wet area by track
Alliaria petiolata	Garlic Mustard		O	Ruderal
Allium vineale	Wild Onion		R	Coastal path
Anagallis arvensis	Scarlet Pimpernel		O	Ruderal
Anchusa arvensis	Bugloss		R	Patch on coastal path
Aphanes sp.	Parsley-piert		LF	Dry ground, including coastal path
Apium nodiflorum	Fool's Watercress		R	Near site entrance
Aquilegia vulgaris	Columbine		O	Ruderal
Arctium minus	Lesser Burdock		O	Ruderal
Armeria maritima	Thrift		LF	Saltmarsh
Artemisia vulgaris	Mugwort		R	Ruderal
Arum maculatum	Lords-and-ladies		O	Hedgerows
Asparagus officinalis	Asparagus		R	Ruderal
Atriplex portulacoides	Sea-purslane		O	Saltmarsh
Atriplex prostrata	Spear-leaved Orache		LF	Saltmarsh, upper foreshore
Atropa belladonna	**Deadly Nightshade**		**R**	**On bare gravel near shore, by boatyard fence; a chalk species presumably colonised from imported chalk soil.**
Barbarea vulgaris	Winter-cress		R	Ruderal
Bellis perennis	Daisy		R	Semi-natural grassland
Beta vulgaris subsp. maritima	Sea Beet		O	Coastal bank
Cardamine hirsuta	Hairy Bitter-cress		F	Ruderal
Centaurea nigra	Common Knapweed		O	Semi-natural grassland
Centaurium erythraea	Common Centaury		O	Ruderal
Cerastium diffusum	Sea Mouse-ear		R	Coastal path
Cerastium fontanum	Common Mouse-ear		O	Various grassland
Cerastium glomeratum	Sticky Mouse-ear		F	Dry ground

Species	English name	Ind.	Freq.	Comments on habitat, etc.
Cirsium arvense	Creeping Thistle		F	Ruderal and rough grassland
Cirsium palustre	Marsh Thistle		R	Damp semi-natural grassland
Cirsium vulgare	Spear Thistle		O	Ruderal
Conyza sumatrensis	Guernsey Fleabane		R	Ruderal
Coronopus didymus (Lepidium didymum)	Lesser Swine-cress		F	Ruderal
Cymbalaria muralis	Ivy-leaved Toadflax		R	Ruderal
Daucus carota	Wild Carrot		P	Semi-natural grassland
Digitalis purpurea	Foxglove		R	Ruderal
Dipsacus fullonum	Wild Teasel		O	Ruderal
Epilobium ciliatum	American Willowherb		R	Ruderal
Epilobium hirsutum	Great Willowherb		O	Ruderal
Epilobium parviflorum	Hoary Willowherb		LF	Ruderal
Epilobium tetragonum	Square-stalked Willowherb		R	Ruderal
Erodium moschatum	Musk Stork's-bill		R	Ruderal
Erophila verna	Common Whitlow-grass		O	Coastal path
Euphorbia peplus	Petty Spurge		P	Ruderal
Fumaria muralis	Common Ramping-fumitory		R	Ruderal
Galium aparine	Cleavers		LF	Ruderal
Genista tinctoria	**Dyer's Greenweed**	**G**	**A**	**Semi-natural grassland**
Geranium dissectum	Cut-leaved Crane's-bill		F	Ruderal
Geranium molle	Dove's-foot Crane's-bill		F	Ruderal
Geranium robertianum	Herb-Robert		R	Ruderal
Glechoma hederacea	Ground-ivy		R	Semi-natural grassland
Hyacinthoides x massartiana	Hybrid Bluebell		R	Ruderal, hedgerows (the native H. non-scripta may also be present)
Hypericum androsaemum	**Tutsan**	**W**	**R**	**One plant in bramble scrub within SINC**
Hypericum humifusum	Trailing St John's-wort		R	Dry ground
Hypericum perforatum	Perforate St John's-wort		F	Mainly on gravel near boatyard
Hypericum tetrapterum	Square-stalked St John's-wort		O	Ruderal
Hypochaeris radicata	Cat's-ear		R	Semi-natural grassland
Inula crithmoides	**Golden Samphire**		**LF**	**Coastal bank**
Iris foetidissima	Stinking Iris	W	O	Hedgerows and coastal scrub
Iris pseudacorus	Yellow Iris		R	Damp grassland
Lamium album	White Dead-nettle		LF	Ruderal
Lamium purpureum	Purple Dead-nettle		O	Ruderal
Leontodon saxatilis	Lesser Hawkbit		F	Dry grassland
Lepidium draba	Hoary Cress		LF	Ruderal
Leucanthemum vulgare	Oxeye Daisy		R	Ruderal
Limonium vulgare	Common Sea-lavender		A	Saltmarsh
Lotus corniculatus	Common Bird's-foot-trefoil		LF	Semi-natural grassland
Lotus glaber (Lotus tenuis)	Narrow-leaved Bird's-foot-trefoil		R	Damp, semi-natural grassland
Lotus pedunculatus	Greater Bird's-foot-trefoil		R	Damp, semi-natural grassland
Malva sylvestris	Common Mallow		R	Ruderal
Medicago arabica	Spotted Medick		F	Ruderal
Medicago lupulina	Black Medick		F	Ruderal
Montia fontana	Blinks		R	A few small patches in damp semi-natural grassland
Myosotis arvensis	Field Forget-me-not		F	Ruderal

Species	English name	Ind.	Freq.	Comments on habitat, etc.
Myosotis discolor	Changing Forget-me-not		R	Ruderal
Myosotis ramosissima	**Early Forget-me-not**		**A**	**Ruderal, including coastal path**
Narcissus agg.	Daffodil		R	Ruderal
Oenanthe crocata	Hemlock Water-dropwort		R	Seedling, presumed to be this sp.
Oenanthe pimpinelloides	**Corky-fruited Water-dropwort**	**G**	**O**	**Semi-natural grassland; also colonising application site**
Oenothera sp.	Evening-primrose		R	Ruderal
Ophrys apifera	Bee Orchid		R	Two plants, one in semi-natural grassland, another in longer established recolonised grassland, W of boatyard.
Orchis morio (Anacamptis morio)	**Green-winged Orchid**	**G**	**R**	**Colony of about 50 small plants, with a few flowering, at edge of scrub, N side of SINC, and a few nearby.**
Papaver somniferum	Opium Poppy		R	Ruderal
Pastinaca sativa	Wild Parsnip		O	Ruderal
Picris echioides (Helminthotheca echioides)	Bristly Oxtongue		F	Ruderal
Plantago coronopus	Buck's-horn Plantain		F	Coastal path
Plantago major	Greater Plantain		R	Ruderal
Plantago lanceolata	Ribwort Plantain		O	Semi-natural grassland, etc.
Plantago maritima	Sea Plantain		LF	Saltmarsh
Potentilla reptans	Creeping Cinquefoil		F	Ruderal
Prunella vulgaris	Selfheal		O	Semi-natural grassland
Pulicaria dysenterica	Common Fleabane		O-LA	Damp, semi-natural grassland and ruderal
Ranunculus acris	Meadow Buttercup		R	Semi-natural grassland
Ranunculus ficaria (Ficaria verna)	Lesser Celandine		R	Hedgerows
Ranunculus repens	Creeping Buttercup		O	Semi-natural grassland
Ranunculus sardous	**Hairy Buttercup**		**P**	**Damp semi-natural grassland**
Reseda luteola	Weld		LF	Ruderal
Rumex acetosa	Common Sorrel		F	Semi-natural grassland
Rumex crispus	Curled Dock		F	Various
Rumex obtusifolius	Broad-leaved Dock		O	Ruderal
Rumex pulcher	**Fiddle Dock**		**R**	**One plant noted near site entrance in 2011.**
Rumex sanguineus	Wood Dock		F	Ruderal
Sagina apetala subsp. erecta	Annual Pearlwort		F	Ruderal
Sagina maritima	Sea Pearlwort		R?	Coastal paths
Sagina procumbens	Procumbent Pearlwort		P	Semi-natural grassland
Sarcocornia perennis	**Perennial Glasswort**		**LF**	**Upper shore**
Scrophularia nodosa	Common Figwort		R	Ruderal
Sedum acre	Biting Stonecrop		LA	Ruderal; well established on gravel by quay
Senecio erucifolius	Hoary Ragwort	G	O	Semi-natural grassland
Senecio jacobaea	Ragwort		F	Semi-natural grassland
Senecio viscosus	Sticky Groundsel		R	Ruderal
Sherardia arvensis	Field Madder		O	Ruderal
Silaum silaus	**Pepper-saxifrage**	**G**	**O**	**Semi-natural grassland, perhaps quite frequent over area.**

Species	English name	Ind.	Freq.	Comments on habitat, etc.
Silene uniflora	Sea Campion		1	One plant in disturbed ground near quay.
Sinapis arvensis	Charlock		O	Ruderal
Sison amomum	Stone-parsley	G	LF	Ruderal
Solanum dulcamara	Bittersweet		O	Ruderal
Sonchus asper	Prickly Sow-thistle		R	Ruderal
Sonchus oleraceus	Smooth Sow-thistle		O	Ruderal
Spergularia marina	Lesser Sea-spurrey		R	Brackish pool
Spergularia media	Greater Sea-spurrey		P	Saltmarsh
Stellaria graminea	Lesser Stitchwort		LF	Semi-natural grassland
Stellaria holostea	Greater Stitchwort		R	Ruderal
Stellaria media	Chickweed		O	Ruderal
Stellaria pallida	**Lesser Chickweed**		**R**	**Coastal path (one small patch)**
Suaeda maritima	Annual Sea-blite		F	Upper foreshore
Symphytum orientale	White Comfrey		R	Ruderal
Tamus communis	Black Bryony	W	F	Hedgerows
Taraxacum sp. agg.	Dandelion		R	Various
Teucrium scorodonia	Wood Sage		R	Hedgerows
Trifolium dubium	Lesser Trefoil		F	Ruderal
Trifolium fragiferum	Strawberry Clover	G	R	Brackish grassland
Trifolium ornithopodioides	**Bird's-foot Clover**		**R**	**A few small patches along coastal path**
Trifolium pratense	Red Clover		R	Semi-natural grassland
Trifolium repens	White Clover		R	Semi-natural grassland
Triglochin maritimum	Sea Arrowgrass		LF	Saltmarsh
Tripleurospermum inodorum	Scentless Mayweed		F	Ruderal
Urtica dioica	Common Nettle		O/LF	Ruderal
Valerianella carinata	Keeled-fruited Cornsalad		R	Ruderal
Veronica arvensis	Wall Speedwell		O	Ruderal
Veronica chamaedrys	Germander Speedwell		R	Ruderal
Veronica persica	Common Field-speedwell		R	Ruderal
Veronica polita	Grey Field-speedwell		R	Ruderal
Veronica serpyllifolia	Thyme-leaved Speedwell		F	Ruderal
Vicia cracca	Tufted Vetch		R	Ruderal
Vicia sativa	Common Vetch		O	Ruderal; including the native subspecies, V.s. nigra.
Viola odorata	Sweet Violet		R	Ruderal
Trees & shrubs				
Acer campestre	Field Maple	W	F	Several in hedgerows to W and N of proposed development site
Betula pendula	Silver Birch		1	Hedgerow
Buddleja davidii	Butterfly-bush		R	Ruderal (older ground W of boatyard)
Cornus sanguinea	Dogwood		R	Hedgerows
Crataegus monogyna	Hawthorn		F	Scrub on SINC and hedgerows
Fraxinus excelsior	Ash		R	Hedgerows
Hedera helix	Ivy		F	Hedgerows
Ilex aquifolium	Holly	W	R	Hedgerows
Ligustrum vulgare	Wild Privet		F	Hedgerows W and N of proposed development site.
Lonicera periclymenum	Honeysuckle		R	Hedgerows

Species	**English name**	**Ind.**	**Freq.**	**Comments on habitat, etc.**
Prunus spinosa	Blackthorn		F	Scrub on SINC and hedgerows
Quercus cerris	Turkey Oak		R	Hedgerow
Quercus robur	Pedunculate Oak		O	Hedgerows
Rosa arvensis	Field Rose	W	R	Hedgerow
Rosa canina	Dog Rose		P	Scrub on SINC
Rosa micrantha	Small-flowered Sweet-briar		O	Scrub on SINC
Rosa stylosa	Short-styled Field-rose		R	Hedgerow
Rubus fruticosus agg.	Bramble		O	Scrub on SINC
Ruscus aculeatus	Butcher's-broom	W	R	Hedgerows
Salix caprea	Goat Willow		R	Hedgerows
Salix cinerea	Grey Willow		O	Scrub on SINC and hedgerows
Sambucus nigra	Elder		R	Hedgerows
Ulex europaeus	Gorse		R	Scrub on SINC
Ulmus procera	English Elm		F	Hedgerows
Old grassland indicators		**8**		
Ancient woodland indicators		**9**		

APPENDIX 5: BIRD FIELD SURVEY DATA

Key: Columns A-F correspond to survey compartments (see **Figure 1**); VC = Verner Common.

DATA FROM SEPTEMBER TO NOVEMBER 2011

Low Tide Count: 7 October 2011
Surveyor: DS Tide times: LT 13:20
Weather: 3/8 cloud cover, slight W breeze.
Count details: Two counts carried out at one hour and two hours after low tide.

Count 1: 14:30

Disturbance: A single dog walker along the northern shore line, but did not cause any disturbance to birds.

Species	A	B	C	D	E	F	Total
Grey Heron					1		**1**
Little Egret						1	**1**
Mute Swan						2	**2**
Brent Goose					1		**1**
Redshank						10	**10**
Curlew		1	3	1	1	2	**8**
Total waterfowl	**0**	**1**	**3**	**1**	**3**	**15**	**23**

Count 2: 15:30

Disturbance: None recorded.

Species	A	B	C	D	E	F	Total
Little Egret						1	**1**
Mute Swan						2	**2**
Redshank						5	**5**
Curlew		1	2		1	1	**5**
Total waterfowl	**0**	**1**	**2**	**0**	**1**	**9**	**13**

Low Tide Count: 9 October 2011
Surveyor: DS Tide times: LT 15:46
Weather: 5/8 cloud cover, slight SW breeze.
One count carried out approximately one hour before low tide.

Count 1: 14:30
Disturbance: a single dog walker along north shore.

Species	A	B	C	D	E	F	Total
Oystercatcher						5	5
Redshank						1	1

Curlew				1	1	5	7
Total waterfowl	**0**	**0**	**0**	**1**	**1**	**11**	**13**

Falling Tide Count: 12 October 2011
Surveyor: DS Tide times: LT 17:42
Weather: Overcast, light westerly breeze.
Count details: Two counts made on falling tide.
Notes: High tide roost on arrival included 290 Curlew on Gutner.

Count 1: 15:00
Disturbance: None recorded.

Species	**A**	**B**	**C**	**D**	**E**	**F**	**Total**
Mute Swan						2	**2**
Brent Goose						55	**55**
Oystercatcher			1		6	1	**8**
Redshank						5	**5**
Curlew			4		1	1	**6**
Total waterfowl	**0**	**0**	**5**	**0**	**7**	**64**	**76**

Count 2: 16:00
Disturbance: None recorded.

Species	**A**	**B**	**C**	**D**	**E**	**F**	**Total**
Little Egret						1	**1**
Mute Swan						2	**2**
Brent Goose						56	**56**
Redshank						5	**5**
Curlew		1	2		1	1	**5**
Total waterfowl	**0**	**1**	**2**	**0**	**1**	**65**	**69**

Low Tide Count: 20 October 2011
Weather: Clear, southwest light breeze, mild.
Surveyor: DS Tide times: LT 10:40
Count details: Single count about 1 hour after low tide.

Count 1: 11:30
Disturbance: two buzzards

Species	**A**	**B**	**C**	**D**	**E**	**F**	**Total**
Little Egret						2	**2**
Brent Goose				2	56	15	**73**
Redshank						5	**5**
Curlew					1	4	**5**
Total waterfowl	**0**	**0**	**0**	**2**	**57**	**26**	**85**

High to Low Tide Count: 26 October 2011

Weather: Torrential rain showers with lighter rain between; wind SE F1-2. Briefly eased and brightened between c.14:30 and 14:45, allowing one accurate count of birds.
Surveyor: JN Tide times: HT 11:20, LT 16:49
Count details: Observed Gutner roost at high tide; three counts on falling tide.
Notes and disturbance: c.730 Brent on Gutner on arrival at 12:20, including c.250 roosting on water on the east side of the spit; also a large flock of Wigeon roosting along western edge. Various waders not countable due to poor visibility and rain, including small numbers of Oystercatcher and possible several hundred Curlew. At 12:45 c.20 Brent feeding on Verner Common saltmarsh. At 13:14 tide still high but just starting to fall; 3 Sandwich Terns feeding in compartment B at Yachthaven. 13:37: small groups of Brent starting to depart roost, including some moving into creek, but many flying off south. 13:45: main flock of Brent departed Gutner roost; tide falling to expose upper shore - first count carried out (no *Zostera* exposed yet). 14:11: various groups of Brent swam up creek, into compartments B, C & D. 14:23: one person and one dog walking on shore path by compartment C. About 18 Canada Geese visible grazing on Verner Common.

Count 1: 13:45 (tide just falling, no *Zostera* visible)
Disturbance: None (see also above).

Species	A	B	C	D	E	F	Total
Little Grebe						2	**2**
Brent Goose					55	60	**115**
Wigeon					88		**88**
Total waterfowl	**0**	**0**	**0**	**0**	**143**	**62**	**205**

Count 2: 14:30 (some mud and *Zostera* uncovered)
Disturbance: Single dog-walker compartment C prior to count (see above). Brent in compartment F roosting on water; rest feeding.

Species	A	B	C	D	E	F	Total
Brent Goose				31	116	39	**186**
Wigeon					25		**25**
Teal					6		**6**
Pintail					2		**2**
Scaup						1	**1**
Grey Plover						1	**1**
Curlew					1		**1**
Redshank					2		**2**
Total waterfowl	**0**	**0**	**0**	**31**	**152**	**41**	**224**

Count 3: 15:00 (Brent Geese only counted due to torrential rain)
Disturbance: None.

Species	A	B	C	D	E	F	Total
Brent Goose		4		77	46	53	**180**

<u>Low Tide Count: 29 October 2011 (Saturday)</u>

Weather: Mild (12°C), very light SW wind, overcast.
Surveyor: JN Tide times: LT c.09:00
Count details: Three counts at low tide.

Notes and disturbance: 08:22: one person with two dogs walking along shore path adjacent to compartments B & A, caused feeding Brent Geese to move away from edge of creek, but these did not fly. Two Canada Geese seen to fly onto Verner Common. 08:28: one person with one dog walking northern shore of compartment F, but no birds nearby. 08:48: one person walking shore adjacent to compartment A - no birds nearby. 09:39 two horse-riders with yellow high-visibility jackets riding around edge of western field of Verner Common, approached Brent Geese feeding in compartment D to about 50m, but geese did not react. 09:45: one person with one dog walked around north shore of compartment F and continued down west side of Gutner peninsula, crossed over to east side and then continued out of view; at one point the dog was running freely on the peninsula but there were no birds feeding nearby and no apparent disturbance caused. 10:10: A Grey Heron flew into channel (compartment B/D) flushing about 100 Brent Geese feeding nearby, which circled around then landed again in the creek.

Count 1: 08:05
Disturbance: None. The Brent were counted twice to check the total.

Species	**A**	**B**	**C**	**D**	**E**	**F**	**Total**
Little Egret		1					**1**
Brent Goose		40	298	79	30	31	**478**
Lapwing						1	**1**
Oystercatcher						2	**2**
Curlew				1		1	**2**
Total waterfowl	**0**	**41**	**298**	**80**	**30**	**35**	**484**

Count 2: 09:00
Disturbance: None. Also 80+ Brent on Verner Common (not all visible) and some feeding along W edge of Gutner, just south of compartment F boundary. Brent in the creek evenly spaced out feasting voraciously on rhizomes of *Zostera.*

Species	**A**	**B**	**C**	**D**	**E**	**F**	**Total**
Brent Goose		7	164	112	180	145	**608**
Wigeon						30	**30**
Curlew			2				**2**
Total waterfowl	**0**	**7**	**166**	**112**	**180**	**175**	**640**

Count 3: 10:00
Disturbance: None at time of count; see above.
Tide starting to come back in, filling channel. No birds visible on Verner Common.

Species	**A**	**B**	**C**	**D**	**E**	**F**	**Total**
Brent Goose		51	192	136	128	110	**617**
Wigeon					16	70	86
Oystercatcher						2	2
Curlew			1		1	1	3
Redshank			1				1
Greenshank						1	1
Total waterfowl	**0**	**51**	**194**	**136**	**145**	**184**	**710**

Falling Tide Count: 5 November 2011 (Saturday)

Weather: Mild, light SE wind, overcast but bright.
Surveyor: JN Tide times: HT 07:02, LT 12:34
Count details: Three counts during falling tide.
Notes and disturbance: 11:03 a Buzzard soared over the base of Gutner peninsula flushing the feeding Brent from compartments E & F, which flew off to the south side of the creek (and possibly some to Verner Common).

Count 1: 10:20 (tide just falling)
Disturbance: None. The female Common Scoter was fishing in the channel, compartment F and later moved further south.

Species	A	B	C	D	E	F	Total
Brent Goose		30	70	15		70	**185**
Wigeon					4	37	**41**
Oystercatcher			1				**1**
Common Scoter						1	**1**
Grey Plover						2	**2**
Curlew			1	1			**2**
Redshank			11			1	**12**
Total waterfowl	**0**	**30**	**83**	**16**	**4**	**111**	**244**

Count 2: 11:30 (falling tide; tide fully out in creek)
Disturbance: None. Teal and Lapwing roosting on mud.

Species	A	B	C	D	E	F	Total
Brent Goose			35	9	16	26	**86**
Lapwing					14		**14**
Oystercatcher						7	**7**
Wigeon						30	**30**
Teal					4		**4**
Pintail			1				**1**
Curlew			1	2		1	**4**
Redshank			5		2		**7**
Total waterfowl	**0**	**0**	**42**	**11**	**36**	**64**	**153**

Count 3: 12:30 (low tide; tide fully out in creek)
Disturbance: None. The Lapwing had moved to Verner Common (though only 3 visible). Also 26+ Canada Geese, 1 Greylag Goose, 36+ Brent and 1+ Curlew feeding on Verner Common. Noticeable fall in birds feeding in the creek.

Species	A	B	C	D	E	F	Total
Brent Goose			39	5	1	4	**49**
Pintail			1				**1**
Oystercatcher						1	**1**
Total waterfowl	**0**	**0**	**40**	**5**	**1**	**5**	**51**

Low Tide Count: 8 November 2011

Weather: Mild, light E wind, overcast, recent rain.
Surveyor: JN Tide times: LT 15:30
Count details: Two counts at low tide.
Disturbance: None; no people seen.

Notes: A flock of c.120 Brent Geese seen feeding on a sown grassland or winter cereal crop, at Northney, opposite start of Gutner Lane.

Count 1: 13:30 (tide almost fully out)
Disturbance: None. Lapwing roosting on mud and another 4 on Verner Common, together with 33+ Canada Geese and 6 Brent Geese.

Species	A	B	C	D	E	F	Total
Little Egret				1			**1**
Brent Goose		1	12	1			**14**
Oystercatcher						2	**2**
Lapwing					8		**8**
Curlew				1	1		**2**
Redshank			3		1	1	**5**
Total waterfowl	**0**	**1**	**15**	**3**	**10**	**3**	**32**

Count 2: 14:00 (tide fully out)
Disturbance: None. At least 17 Brent, 21 Canada Geese and 6 Lapwing visible on Verner Common.

Species	A	B	C	D	E	F	Total
Brent Goose			2	1			**3**
Oystercatcher						3	**3**
Lapwing				4			**4**
Curlew					1	1	**2**
Redshank					1		**1**
Total waterfowl	**0**	**0**	**2**	**6**	**2**	**4**	**13**

DATA FROM OCTOBER 2010 TO MARCH 2011

Tidal Cycle Count: 19 October 2010

Start 10:20; high water 10:00, height 4.4m.

Weather: 14°C clear, sunny, dry.

Compartment A

Species	Count 1	Count 2	Count 3	Count 4	Count 5	Count 6
Little Egret	1				1	1

Compartment B

Species	Count 1	Count 2	Count 3	Count 4	Count 5	Count 6
Little Egret		1	1			

Compartment C

Species	Count 1	Count 2	Count 3	Count 4	Count 5	Count 6
Little Egret		1			1	1
Redshank						10
Curlew						2

Compartment D

Species	Count 1	Count 2	Count 3	Count 4	Count 5	Count 6
Little Egret						

Compartment E

Species	Count 1	Count 2	Count 3	Count 4	Count 5	Count 6
Little Egret				3		
Brent Goose					45	56
Redshank				2	10	9
Curlew					2	2

Compartment F

Species	Count 1	Count 2	Count 3	Count 4	Count 5	Count 6
Little Egret						1
Brent Goose		320	325			18
Redshank	21	21	12	10	10	4

Curlew	5	5			2	4

Tidal Cycle Count: 17 February 2011

Start 10:45; high water 10:39, height 4.7m.

Weather: clear but very cold, 5°C with slight NE wind, dry.

Compartment A

Species	Count 1	Count 2	Count 3	Count 4	Count 5	Count 6
Redshank		1				

Compartment B

Species	Count 1	Count 2	Count 3	Count 4	Count 5	Count 6
Redshank		1	5		1	

Compartment C

Species	Count 1	Count 2	Count 3	Count 4	Count 5	Count 6
Redshank	1		5	2		

Compartment D

Species	Count 1	Count 2	Count 3	Count 4	Count 5	Count 6
Teal				4	4	
Oystercatcher				2	1	
Redshank				2	1	

Compartment E

Species	Count 1	Count 2	Count 3	Count 4	Count 5	Count 6
Teal	17	17	17	18		5
Oystercatcher				2	1	2
Redshank	3	3		2	3	
Curlew				1	1	2
Grey Plover			3	3	1	

Compartment F

Species	Count 1	Count 2	Count 3	Count 4	Count 5	Count 6
Brent Goose						21
Shelduck	22					

Teal	35	35	5	5	5	
Oystercatcher		3	5	5	6	2
Redshank	12	3	6	10	10	4
Curlew	3	4	4	3	4	3

Tidal Cycle Count: 4 March 2011

Start 11:50; high water 11:31, height 4.6m.

Weather: cold, 3°C, slight NNE wind increasing later in the day, dry, 5/8 cloud cover.

Compartment A

Species	Count 1	Count 2	Count 3	Count 4	Count 5	Count 6
Little Egret	1					

Compartment B

Species	Count 1	Count 2	Count 3	Count 4	Count 5	Count 6
Oystercatcher			1			
Redshank			1			

Compartment C

Species	Count 1	Count 2	Count 3	Count 4	Count 5	Count 6
Little Egret		1			1	1
Brent Goose	2	7	7	8	7	7
Teal			6			
Oystercatcher				1		
Redshank	1	2	2	8		

Compartment D

Species	Count 1	Count 2	Count 3	Count 4	Count 5	Count 6
Little Egret						
Curlew	1				2	
Redshank			1	1		

Compartment E

Species	Count 1	Count 2	Count 3	Count 4	Count 5	Count 6
Little Egret		1				
Oystercatcher			1	4	5	5
Redshank			4	4	4	5

Teal			5	5	8	12
Curlew					3	1
Grey Plover		3	3	3	2	1

Compartment F

Species	**Count 1**	**Count 2**	**Count 3**	**Count 4**	**Count 5**	**Count 6**
Little Egret	1	1				1
Brent Goose	5					22
Oystercatcher	6	7	9	11	3	
Redshank	4			3	3	
Curlew	5	5			2	4

<u>Low Tide Count: 21 March 2011</u>

Count 1: 15:15

Species	**A**	**B**	**C**	**D**	**E**	**F**	**Total**
Little Egret				1			**1**
Mallard						2	**2**
Oystercatcher						2	**2**
Curlew			1		1		**2**
Redshank						3	**3**
Total waterfowl	**0**	**0**	**1**	**1**	**1**	**7**	**10**

Count 2: 17:20

Species	**A**	**B**	**C**	**D**	**E**	**F**	**Total**
Little Egret						1	**1**
Grey Plover						1	**1**
Curlew						1	**1**
Redshank			2		1	2	**5**
Total waterfowl	**0**	**0**	**2**	**0**	**1**	**5**	**8**

High Tide Roost Counts, Summary

Conducted during tidal cycle counts.

Gutner Peninsula

Species	October	February	March
Little Egret	3		
Brent Goose	56	550	268
Shelduck		22	25
Teal		18	
Oystercatcher		73	57
Redshank	23		
Curlew	250	420	290
Black tailed godwit		14	
Redshank	34		14
Lapwing		200	185
Total waterfowl	**366**	**1297**	**839**

Verner Common Saltmarsh

Species	October	February	March
Little Egret			
Brent Goose	355	234	45
Shelduck			3
Teal		35	17
Oystercatcher		14	7
Curlew	5	362	78
Black tailed godwit			3
Redshank	21	28	12
Greenshank		1	
Lapwing	1	65	117
Grey Plover		3	3

Observations of Waterfowl on Verner Common during Tidal Cycle Counts

Species	Notes
Brent Goose	Regular small flocks feeding on eastern field. Maximum of 155 on 4 March.
Teal	Small numbers feeding in shallow pools on eastern field maximum 10 on 19 February.
Oystercatcher	1 seen feeding on 19 October on the eastern field.
Lapwing	Feeding flocks. Up to 250 on 4 March, 120 on 17 February and 43 on 19 October

	feeding on both eastern and western fields.
Curlew	Maximum of 34 on 4 March; otherwise small groups of up to 10 birds mostly seen to be feeding on eastern field.

APPENDIX 6: EELGRASS CODE OF CONDUCT

Proposed Code of Conduct for boat users in Yachthaven Creek to prevent damage to eelgrass. Based on a similar code in Studland Bay, Dorset (see www.dorsetwildlifetrust.org.uk/support.html)

- Do not drop litter within the creek
- Use fixed moorings to avoid anchoring
- Do not anchor outside of the navigation channel
- If you have to anchor, do so on bare mud areas avoiding eelgrass beds
- Avoid using the boat (sea) toilets within the creek
- Keep to the speed limit (8 knots) whilst in the creek
- Avoid grounding on the eelgrass, but if this happens allow the ride to refloat you

Yachthaven, Hayling Island

Revised Ecological Assessment

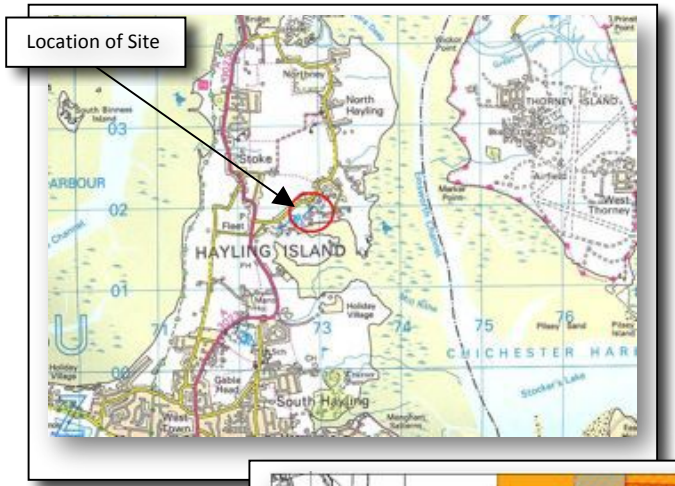
July 2012

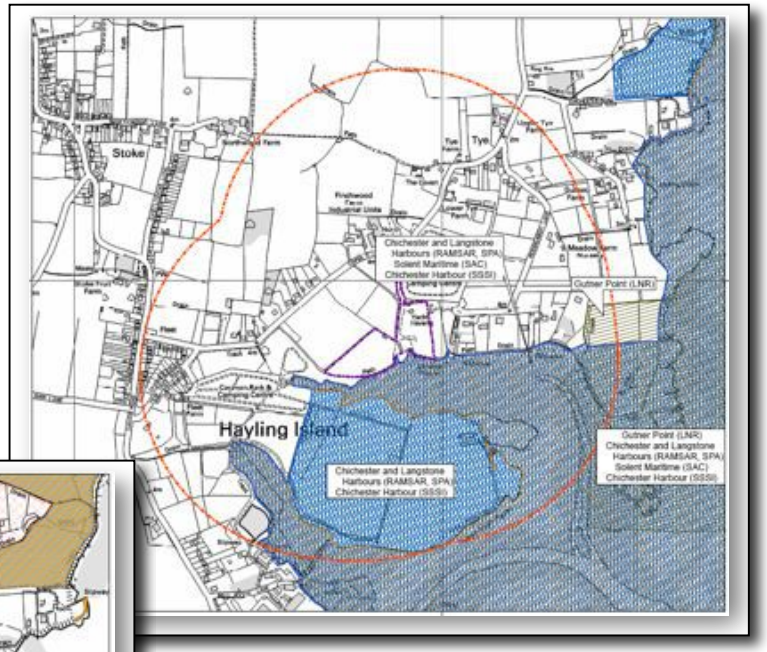
Liam Russell BSc MSc MIEEM
John Norton BSc MIEEM
Dean Swensson

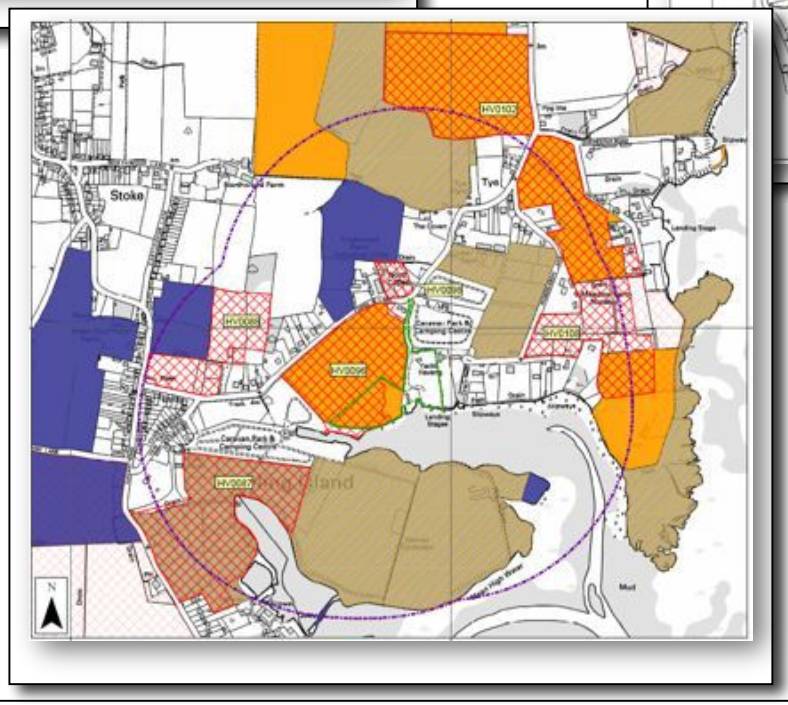
YACHTHAVEN, HAYLING ISLAND

MAP 1

Site Location & Conservation Designations







Location of site

SINCs

SSSIs

SAC

SPA

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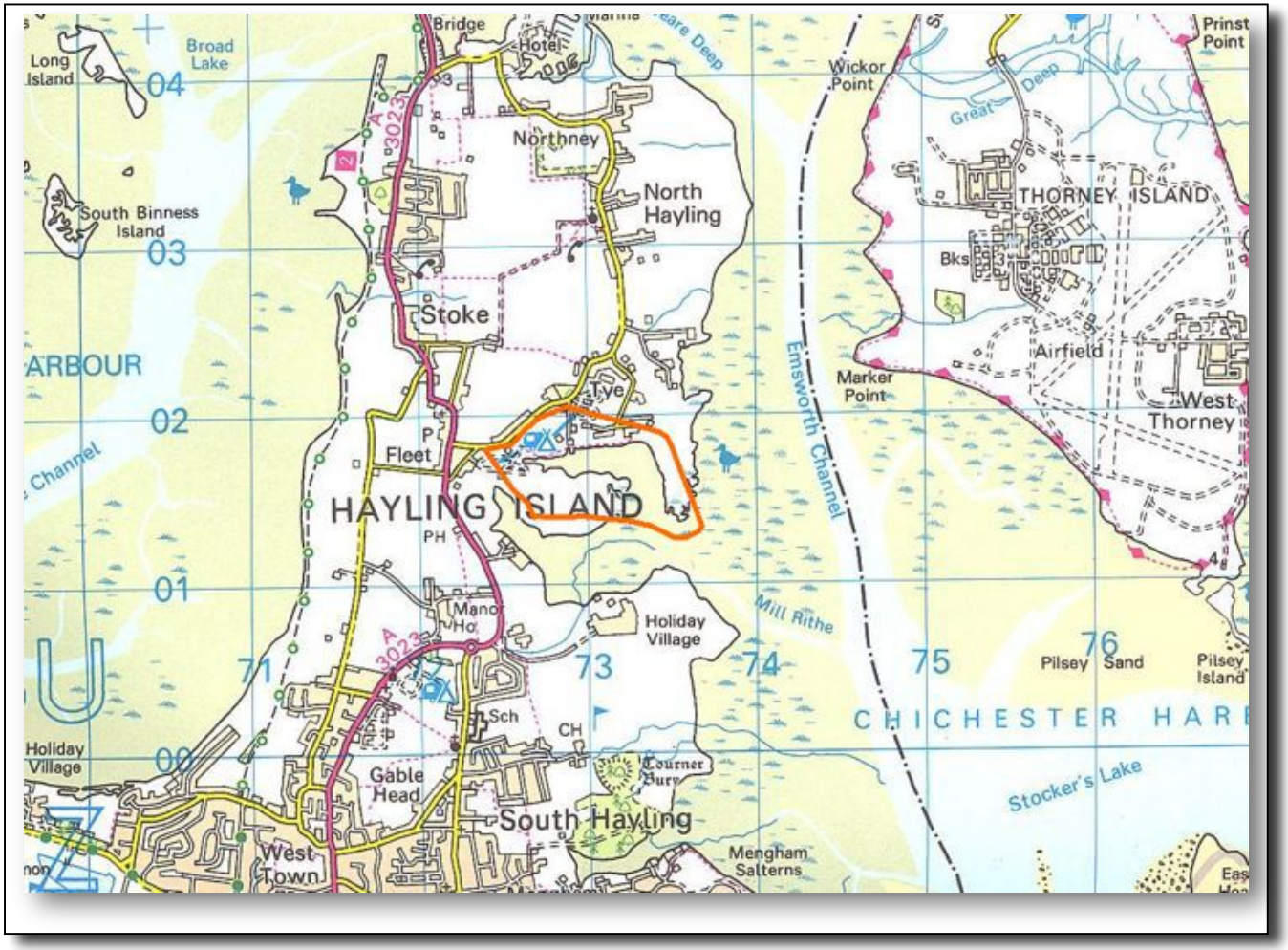
YACHTHAVEN, HAYLING ISLAND



MAP 2

Zone Of Influence

Zone of influence

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YACHTHAVEN, HAYLING ISLAND

MAP 3

Habitats & Vegetation On The Site

- Approximate site boundary (to MHW)
- Hedgerow, trees and scrub (W10c, W21a, W24a)
- Unimproved, species rich grassland and marsh (mainly MG6)
- Rough, species poor grassland (MG1a, MG6a)
- Disturbed and man-made habitats (X = cleared scrub) (re-establishing MG1b & MG6a)
- Saltmarsh (SM6, SM8, SM13c, SM24)
- Extent of Golden-samphire on coastal bank
- Ditch / depression

Dominant species:

Qr	Pedunculate Oak *Quercus robur* (larger trees circled)
Sc	Grey Willow *Salix cinerea*
Cm	Hawthorn *Crataegus monogyna*
Ps	Blackthorn *Prunus spinosa*
Rf	Bramble *Rubus fruticosus* agg.
Bd	Buddleia *Buddleja davidii*

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YACHTHAVEN, HAYLING ISLAND

MAP 4

Solent Waders And Brent Goose Strategy Sites

(Awaiting information)

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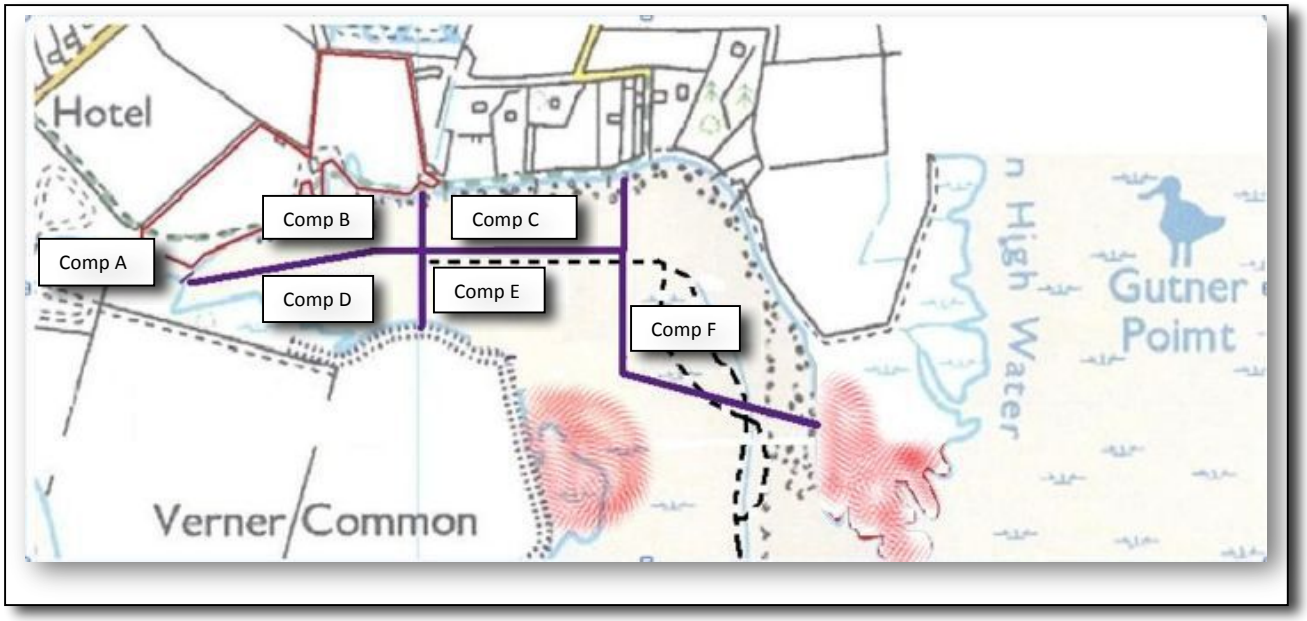
MAP 5

Bird Survey Areas



Bird survey compartments

Route of boat disturbance survey

Site boundary

High tide bird roosts

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YACHTHAVEN, HAYLING ISLAND

MAP 6

Reptile Survey

Location of reptile refugia

Suitable reptile habitats

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YACHTHAVEN

MAP 7

Coastal Mitigation

Measurements of Proposed Pontoon & Moored Boats

Main pontoon walkway = 107.50m^2

Main pontoon 'T head' 37.50m^2

4 x pontoon fingers = 22.50m^2

Total Area 167.5m^2

Hull area of 12 moored yachts based on maximum hull dimension of 40m^2 and 80% of hull sat on intertidal area = 384m^2
Total Area 551.50m^2

Area subject to clearance of existing metal pontoons and imported rubble and tarmac debris

240 m^2

55 m^2

78 m^2

545 m^2

Total: 918 m^2

Difference 366.5m^2

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YACHTHAVEN, HAYLING ISLAND

MAP 8

Coastal Grassland and Wetland Nature Reserve

Reptile Hibernacula incorporating suitable invertebrate habitat

Approximate location of Barn owl box

Image I. Approximate current extent of scrub and grassland although scrub likely to have increased significantly since this photograph

Image II. Proposed capital and log-term management to restore mix of grass and scrubland mix of 70/30 ratio

Existing scrub to be cleared to leave northern boundary hedgerow to screen public footpath

Scrub to be retained to screen footpath and Caravan Park

Stock fencing erected to minimise human and dog disturbance

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YACHTHAVEN, HAYLING ISLAND

MAP 9

Yachthaven Coastal Grassland Nature Reserve

Access gate for annual management

Additional native species hedgerow

Re-seeding with floristically diverse grassland

Suitable specification fence so not to allow access from dogs or walkers

- Reptile/invertebrate hibernacula

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