The Ecology Consultancy

Shoreham Harbour / Ecology and Green Infrastructure Study / **Report for Adur District Council**

The Ecology Consultancy

Shoreham Harbour

Ecology and Green Infrastructure Study

Report for Adur District Council

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Contents

Executive Summary

The Ecology Consultancy (TEC) was commissioned by Shoreham Harbour Regeneration[1] to undertake an ecology and green infrastructure study of land within the Shoreham Harbour Regeneration Area (hereby referred to as the 'regeneration area').

Shoreham Harbour Regeneration has also commissioned TEC to undertake an assessment of Basin Road South Site of Nature Conservation Importance (SNCI) and the potential for vegetated shingle creation on Southwick and Portslade Beaches. This assessment is provided as a separate report which should be read alongside this study.

The main findings of this study are as follows:

- Four strategic sites have been identified for new development to be delivered over the next 5-10 years, as follows:
  - Strategic site 1 (SS1): Aldrington Basin;
  - Strategic site 2 (SS2): South Portslade;
  - Strategic site 3 (SS3): Southwick Waterfront;
  - Strategic site 4 (SS4): Western Harbour Arm;
- The regeneration area covers an area of c.302ha, is dominated by buildings and hardstanding, but includes semi-natural habitat types. Habitats of highest ecological value are mainly associated with the estuary of the River Adur and coastline on either side of the harbour mouth at Shoreham Beach and Southwick Beach. These areas include intertidal mudflats, coastal saltmarsh and coastal vegetated shingle which are all habitats of principal importance for the conservation of biodiversity in England.
- There are no European designated sites such as Special Areas of Conservation (SAC), Special Protection Areas (SPA) or Ramsar sites within the regeneration area. The closest SAC is Castle Hill, located approximately 9.45km to the east, whilst the closest SPA and Ramsar site is the Arun Valley (also designated a SAC), which is 20km to the north-west.

[1] Shoreham Harbour Regeneration Partnership is made up of Adur District Council, Brighton & Hove City Council, West Sussex County Council and Shoreham Port Authority.

- The Habitat Regulations Assessment screening process for the Adur Local Plan and Brighton & Hove City Plan, which includes the regeneration area, concluded that there will be no significant impacts on these European sites and that an Appropriate Assessment is not required.
- Adur Estuary SSSI is adjacent to the western boundary of the regeneration area and specifically SS4. It is a statutory designated nature conservation site receiving legal protection under several Acts of Parliament. Any direct or indirect impact on this SSSI, or the species for which it is designated, as a result of development should be avoided.
- The most likely impact on the SSSI of wider work across the regeneration area is from the proposed flood defence upgrade. Current defence options for SS4 have been identified as having potential to adversely affect the nature conservation value of the SSSI. Further assessment of the potential impacts of the preferred concept option are required, as is formal screening by ADC to determine the need or otherwise for an Environmental Impact Assessment (EIA).
- The entire regeneration area is within the Impact Risk Zone for Adur Estuary SSSI with development proposals to the west of the harbour mouth at SS4 presenting the highest potential risk to the SSSI. Consultation with Natural England is required to initially determine how potential impacts for individual development proposals would vary across the regeneration area depending on the scale, type and proximity of development and what the statutory requirements are. The proximity of the development to Adur Estuary SSSI, in particular SS4, is highly likely to trigger the requirement for an EIA and a screening opinion from ADC should be sought.
- The eastern end of Shoreham Beach SNCI is within the regeneration area. A large part of this SNCI is also designated as a Local Nature Reserve (LNR) whose boundary is adjacent to the regeneration area. Basin Road South SNCI is located at the eastern end of the regeneration area, adjacent to SS1. The review of this SNCI as part of the vegetated shingle survey concluded that whilst the vegetated shingle present within the SNCI is not considered to be an outstanding example of its type, and it covers only 0.43ha of this 1.1ha site, it nevertheless represents the largest example of this internationally important habitat type in Brighton and Hove and also has the potential for enhancement.
- Both SNCIs are non-statutory designated nature conservation sites and any adverse impact on them is a material consideration in the planning process. It is recommended that, where possible, works that may result in the loss of, or other

impacts on, these SNCI habitats are avoided. These habitats should be retained and protected, except where loss is unavoidable after alternative options have been sought, and only after an appropriate programme of mitigation, compensation and enhancement has been put in place. The potential for creation of coastal vegetated shingle on Southwick and Portslade Beaches is high. This coastal frontage provides good opportunities for any necessary compensation required due to impacts to/loss of coastal vegetated shingle within the regeneration area as well as for enhancements aiming to increase the overall extent of this rare and internationally important habitat.

- The intertidal zone supports the most important habitats in SS4 including c.1.3ha of mudflat and c.0.035ha of saltmarsh. Saltmarsh is relatively species-poor, confined to the concrete block revetment and comprises a vegetation community that is widespread in the south-east. No protected, threatened, nationally rare/scarce, county notable or BAP plant speces were present and overall it is not considered to be a good example of its type, but nevertheless qualifies as a habitat of principal importance. Where loss of these habitats of principal importance will occur and it is recommended that flood defences include replacement habitat as an integral part of their design or alternative compensatory habitat is sought off-site to SS4, within the Adur Estuary.

- SS1-4 have potential to support a range of protected and/or species of principal importance including breeding birds; badgers; widespread reptiles (slow-worm and common lizard); bats; invertebrates and seahorses. Further surveys for both strategic sites and parts of the wider regeneration area are recommended below and for the most part will be the responsibility of individual land-owners/developers to carry out as part of their planning applications.

Summary of Recommended Further Surveys

Survey Type	Strategic Sites				Other Survey Areas
	1	2	3	4	
Bats (building inspections)	✓	✓	✓	✓	
Reptile					North Canal Bank
Botanical/Habitat					North Canal Bank
Breeding Bird					Southwick and Shoreham Beaches, North Canal Bank
Black Redstart	✓				Warehouses and compounds adjacent to Southwick Canal
Badger (Pre-Construction Check)		✓			North Canal Bank
Invertebrate (Aquatic)				✓	
Invertebrate (Terrestrial)				✓	High quality Open Mosaic Habitat

					sites across regeneration area
Seahorse (TBC with Natural England)	✓		✓	✓	Southwick Canal and River Adur

- Due to the linear arrangement of these sites (excluding Site 7) they individually provide wildlife corridors (particulalrly Site 11) and collectively provide a series of 'stepping stones' for wildlife moving east-west across the regeneration area. Connectivity between these areas of greenspace can be improved through private and public realm landscaping to create a green chain extending for over 3.5km between Hove Lagoon and Kingston Beach.
- A series of green spaces along the A259 act as 'stepping stones' for wildlife moving across the eastern half of the regeneration area. There is potential to enhance these sites and improve links through landscape planting in the private and public realm. A Green Infrastructure (GI) Strategy for Shoreham Harbour should be produced to develop more detailed design for GI, including the proposed A259 green corridor and corridor of coastal vegetated shingle habitats along Southwick and Portslade Beaches.
- It is recommended that further consultation with statutory and non-statutory consultees is undertaken as part of masterplanning and to agree further surveys outlined in this report (in particular seahorses).
- A range of measures to mitigate/compensate potential impacts and enhance the biodiversity value of the regeneration area have been provided. Key measures include pollution prevention control, creation of intertidal habitats, translocation and creation of vegetated shingle habitat, minimising impact on migrating fish, minimising spread of invasive plant species, appropriate landscape planting and lighting schemes and green roofs, green walls, and Sustainable Drainage Systems (SuDS).

1 Introduction

BACKGROUND

1.1 The Ecology Consultancy was commissioned by Shoreham Harbour Regeneration to undertake an Ecology and Green Infrastructure (GI) Study of land within Shoreham Harbour Regeneration Area (hereby referred to as the 'regeneration area').

1.2 Shoreham Harbour Regeneration Partnership[2] is producing a Joint Area Action Plan (JAAP) for theregeneration area. As part of the JAAP four strategic sites within the harbour area have been allocated for the development of new housing and employment space. The JAAP will be an important part of both Adur District Council and Brighton & Hove City Council's (BHCC) Local Development Frameworks (LDF).

1.3 Shoreham Harbour Regeneration have commissioned The Ecology Consultancy to carry out an assessment of Basin Road South SNCI and the potential for vegetated shingle creation on Southwick and Portslade Beaches. This assessment (The Ecology Consultancy, 2015) is provided as a separate report which should be read alongside this study.

SCOPE OF THE REPORT

1.4 This study has three purposes, each applicable at different geographic scales:

- It identifies the potential impacts of each strategic site allocation and provides outline recommendations for avoidance, mitigation, compensation and enhancement for each allocation in context to local plans, policies and development briefs.
- It brings together the findings from a series of baseline ecology surveys undertaken in 2009-2010 which will form part of the evidence base for the JAAP, due to be submitted for public examination late 2015.
- It combines the findings of GI assessments undertaken in 2009-2010 and those carried out in 2015 to identify how ecological connectivity will be maintained and

[2] Shoreham Harbour Regeneration Partnership is made up of Adur District Council, Brighton & Hove City Council, West Sussex County Council and Shoreham Port Authority.

improved across the regeneration area and wider landscape and how GI features can be retrofitted to existing areas of greenspace.

1.5 The key elements of this study include:

- Updated data search and review/collation of existing ecological studies to identify the ecological baseline and assess current status and accuracy of this information;
- Review/collation of local planning, green infrastructure (GI) and open space documents, including design guidance, development briefs, species or habitats of principal importance[3] and Biodiversity Action Plans (BAPs);
- Ecological assessment of four strategic sites within the regeneration area;
- Survey and assessment of intertidal habitat located along the Western Harbour Arm frontage;
- High level assessment of potential ecological impacts of development proposals on the four strategic sites and wider regeneration area, including recommendations for habitat retention, mitigation, compensation and enhancement;
- Production of an Ecological Opportunities and Constraints Plan (ECOP) for each of the four strategic sites and the wider regeneration area; and
- Assessment of opportunities to retrofit GI features in 15 areas of existing greenspace within the regeneration area, the majority of which are outside of strategic sites.

1.6 It should be noted that existing ecological studies carried out in 2009 were based on a wider regeneration area than is currently proposed, with a significantly higher level of development and land reclamation along the seaward side of the harbour. Their findings included the need for a wide range of further studies/surveys, of which some, such as marine based surveys, are now not required.

SITE CONTEXT AND STATUS

1.7 The regeneration area, as identified in the JAAP, is located between the western end of Hove seafront and the Adur Estuary at Shoreham-by-Sea. The harbour stretches for five kilometres of waterfront, bounded by the A259, the West Coastway railway line and the coastal communities of Shoreham-by-Sea, Kingston-by-Sea, Southwick,

[3] Habitats and Species of Principal Importance for the Conservation of Biodiversity in England as defined by Section 41 of the Natural Environment and Rural Communities (NERC) Act 2006.

Fishersgate, South Portslade and Hove. The western and central parts of the regeneration area are in Adur district (within West Sussex) the eastern end is within Brighton & Hove.

1.8 The regeneration area includes Shoreham Harbour and its immediate environs and covers an area of approximately 302 hectares (ha). The harbour is situated around the River Adur estuary and lies within a densely built up environment, including a mixture of residential, commercial and industrial buildings, with the latter concentrated around the Eastern Arm of the harbour and Southwick Canal. The canal extends behind and parallel to the coastal frontage and is enclosed by lock gates which maintain stable water levels. Habitats considered to be of ecological value within the regeneration area are mainly associated with the river edge and coastline either side of the harbour mouth. Such habitats include intertidal mudflats, saltmarsh, coastal grassland and vegetated shingle, including both statutory and non-statutory designated nature conservation sites (see Section 3 for details).

1.9 Four strategic sites have been identified for new development to be delivered over the next 5-10 years:

- Strategic site 1 (SS1): Aldrington Basin within Brighton and Hove;
- Strategic site 2 (SS2): South Portslade within Brighton and Hove;
- Strategic site 3 (SS3): Southwick Waterfront within Adur; and
- Strategic site 4 (SS4): Western Harbour Arm within Adur.

DESCRIPTION OF THE PROPOSALS

1.10 The Proposed Submission version of the Shoreham Harbour JAAP (Shoreham Harbour Regeneration, in progress) includes the following proposals relevant to this study:

- Delivering up to 1,400 new homes to 2031[4]
- Consolidation of Shoreham Port operations into the eastern arm and canal;

[4] Development briefs have been adopted for these sites, but will be replaced by the JAAP once it is formally adopted. In the interim these briefs will continue to be of material consideration in the planning process.

- Approximately 23,500m^2 of new and improved employment generating floorspace;
- Package of measures to improve highway infrastructure including pedestrian and cycle access to the waterfront;
- In partnership with Environment Agency (EA), delivering a comprehensive upgrade to existing flood defences which may include encroachment on intertidal habitats;
- Improvements to local community services and facilities and provision of new and improved open spaces and play areas.
- Delivering a new public waterfront route along the Western Harbour Arm;
- Delivering improved facilities for boat-users and waterfront features including moorings, seating and public realm;
- Protecting environmental assets and sites from the impacts of development;
- Promoting the creation of a green corridor and coastal vegetated shingle habitats as part of an enhanced green infrastructure network.

1.11 A summary of more detailed proposals for each strategic site are given below.

Aldrington Basin: Strategic Site 1

1.12 New employment (7,500m^2) has been identified as the dominant land-use type for Aldrington Basin alongside mixed-use development and residential (300 homes). These targets will be delivered in combination with SS2 and as part of new and improved port operational facilities as well as compatible non-port employment uses. Proposals within the development brief for SS1 (Shoreham Harbour Regeneration/Allies and Morrison Urban Practitioners, 2013a) include:

- New residential development will only be considered acceptable along the northern edge of the basin above the Kingsway;
- New residential schemes along the Kingsway (A259) corridor will be appropriately set-back to provide an appropriate scale and character, in combination with landscaping and signage improvement;
- Connections between Aldrington Basin, Hove Lagoon and the waterfront through relatively minor interventions in formal landscape and site layout. This may include an opening through the hedge bordering the lagoon, on Basin Road South;

- Improving Basin Road South's National Cycle Network (NCN2) and long distance footpath (Monarch's Way) through a comprehensive landscaping upgrade and interpretive signage; and
- Improvements and widening of Basin Road North to form a more accessible route through the operational port and lead HGVs more directly on to the advisory route at Church Road.

South Portslade: Strategic Site 2

1.13 Approximately 300 new homes and 7500m^2 of new employment floorspace will be delivered in combination with SS1. Proposals within the development brief for SS2 (Shoreham Harbour Regeneration/Allies and Morrison Urban Practitioners (2013a) include:

- Carefully managed release of existing (predominantly industrial use) sites for mixed-use redevelopment opportunities at selected plots around the periphery. The core of the industrial estate will remain protected for employment uses;
- New residential developments (mix of apartments, terraced town houses and mews housing) will contribute to the creation of a softer edge to the fringes of the port operational and employment areas and help to deliver public realm and infrastructure improvements;
- Improved connections and streetscape along Wellington Road (A259) corridor including set-back residential development;
- Improved linkages to existing recreation and open space assets as per SS1; and
- Any future development of community assets such as the Belgrave Day Centre to consider environmental improvements.

Southwick Waterfront: Strategic Site 3

1.14 SS3 has been identified for delivery of new employment floorspace, provision of small-scale business units, and incremental redevelopment of Lady Bee Marina in line with Shoreham Port Authority's Masterplan (2010). Key land uses are likely to include:

- Delivery of 4,000m^2 gross employment floorspace (c.1600m^2 net additional);
- Improved marina facilities, expanded berthing capacity and waterside leisure provision, including a new slipway, utilising canal edge water space to the east;
- Small business units suitable for marine-related industries;

- Complimentary waterside facilities and attractions, such as specialist fish restaurant, expanded chandlery, café/bar and public conveniences;
- Possible location for the Sea Cadets and Nautical Training Corps;
- Improved alignment of Nautilus House access road serving the local industrial / workshop units and the dry dock.

1.15 Ongoing protection will be provided for the functioning of the dry dock ensuring that land uses in the immediate vicinity do not compromise its ongoing efficient use.

Western Harbour Arm: Strategic Site 4

1.16 SS4 has been identified for comprehensive redevelopment with the aim of creating an exemplar sustainable, residential-led, mixed-use area including approximately 1100 new homes. A priority is to deliver a high-quality cycle and pedestrian route along the waterfront to create better linkages with Shoreham town centre and surrounding areas and to create a positive inter-relationship with the river environment. Future plans should also enhance the area's natural biodiversity by incorporating multi-functional greenspace, Other proposals include improved connections and streetscape along Brighton Road (A259) corridor and integration of the new flood defence network with a high quality public realm environment (Shoreham Harbour Regeneration/Allies and Morrison Urban Practitioners, 2013b).

2 Methodology

DESK STUDY

Data Search

2.1 The Ecology Consultancy is a partner organisation with the Sussex Biodiversity Records Centre (SxBRC) and holds biological data sets compiled by the SxBRC from records provided by local recorders. Data is provided to the SxBRC by a range of individual biological recorders, recording groups, private, public and charitable sector organisations. Data remains the property of the original recorder and is reproduced with permission.

2.2 A biological data search for the site and surrounding land within 1 kilometre (km) of its boundary was undertaken in March 2015, including a search using an on-line mapping service for information on statutory designated sites (MAGIC, 2014). A review of data searches carried out as part of previous ecological assessments was also carried out.

2.3 Information sourced from the desk study included:

- statutory sites of nature conservation importance;
- non-statutory sites designated as SNCIs at county level, recognised as being of local conservation importance and often recognised in Local Planning Authority development plans;
- legally protected species[5]; and
- notable habitats[6] and species[7] which may be relevant to the site, including Habitats and Species of Principal Importance for the Conservation of Biodiversity in England as defined by Section 41 of the Natural Environment and Rural Communities

[5] Legally protected species include those listed in Schedules 1, 5 or 8 of the Wildlife and Countryside Act 1981; Schedule 2 of the Conservation of Habitats and Species Regulations 2010 (as amended); or in the Protection of Badgers Act 1992 (as amended).

[6] Notable habitats include habitats of principal importance; Local BAPs habitats; Ancient Woodland Inventory sites; and Important Hedgerows as defined by the Hedgerow Regulations 1997.

[7] Notable species include species of principal importance; those listed on LBAPs; Birds of Conservation Concern (Eaton *et al.*, 2009); and/or Red Data Book/nationally notable species (JNCC, undated).

(NERC) Act 2006[8] (hereby referred to as 'species or habitats of principal importance').

Existing Ecological Studies

2.4 The following key ecological studies have been reviewed:

- Shoreham Joint Area Action Plan Bat Potential Scoping Survey (Halcrow, 2009);
- Shoreham Harbour and Adur District Great Crested Newt Pond Survey (Halcrow, 2009);
- Shoreham Joint Area Action Plan Ecological Scoping Report (Halcrow, 2009);
- Shoreham Harbour JAAP Area Summary Phase 2 Ecological and Green Infrastructure Studies (Halcrow, 2009);
- Review of the Birds of Shoreham Harbour (Ecology Consultancy, 2009);
- Shoreham Harbour Winter Bird Survey (The Ecology Consultancy, 2009);
- Shoreham JAAP Reptile Survey Report (Halcrow, 2009);
- Shoreham JAAP Vegetated Shingle Survey Report (Halcrow, 2009);
- Shoreham Harbour Regeneration Seahorse Survey Report (EMU, 2009);
- Shoreham Harbour Joint Area Action Plan (JAAP) Ecology Baseline Information (EPR, 2009).

Other Documents

2.5 The following key GI studies, open space assessments and design guidance have been reviewed:

- Adur District Green Infrastructure and Wildlife Corridors Study (Halcrow, 2009);
- Shoreham Harbour Joint Area Action Plan - Assessment of Open Space and Recreation (PMP, 2009);
- A Green Network for Brighton & Hove (Brighton & Hove City Council, 2009);
- Shoreham Harbour Streetscape Guidance (BDP, 2012);

[8] Section 41 (S41) of the NERC Act (2006) includes a published list of habitats and species which are of principal importance for the conservation of biodiversity in England. It is used to guide decision-makers such as LPAs in implementing their duty under section 40 of the NERC Act (2006), to have regard to the conservation of biodiversity in England, when carrying out their normal functions. Further details of the NERC Act can be found at: www.opsi.gov.uk/acts/acts2006/ukpga_20060016_en_1.

- Adur and Worthing Open Space Assessment Report (Knight Kavanagh & Page, 2014).

Local Planning Documents

2.6 The following local planning documents, including BAPs, sustainability appraisals, strategic environmental assessments and development briefs have been reviewed:

- Brighton and Hove Local Plan (Brighton and Hove City Council, 2005);
- Brighton and Hove Supplementary Planning Document (SPD) 11: Nature Conservation and Development (Brighon and Hove City Council, 2010);
- Brighton & Hove Submission City Plan Part One (Brighton and Hove City Council, 2013);
- The Brighton & Hove Local BAP (Brighton and Hove City Council, 2012);
- Western Harbour Arm Sustainability Appraisal & Strategic Environmental Assessment (Shoreham Harbour Regeneration, 2013a);
- South Portslade Industrial Estate and Aldrington Basin Sustainability Appraisal & Strategic Environmental Assessment (Shoreham Harbour Regeneration, 2013b);
- Shoreham Harbour Western Harbour Arm Development Brief (Shoreham Harbour Regeneration/Allies and Morrison Urban Practitioners, 2013a);
- Shoreham Harbour South Portslade Industrial Estate and Aldrington Basin Development Brief (Shoreham Harbour Regeneration/Allies and Morrison Urban Practitioners, 2013b);
- Adur Local Plan (Adur District Council, 2014);
- Shoreham Harbour Draft Joint Area Action Plan (Shoreham Harbour Regeneration, in progress);
- Sustainability Appraisal and Strategic Environmental Assessment of the Shoreham Harbour Regeneration Project (Shoreham Harbour Regeneration, 2014b);
- Shoreham Harbour Flood Risk Management Guide SPD (Adur District Council, 2015a);
- Shoreham Harbour Flood Risk Management Guide SPD Technical Annex (Adur District Council, 2015b).

HABITAT SURVEYS

Personnel

2.7 The surveys, assessment and report were conducted and written by Ben Kimpton MSc, BSc, Dip(Hort) MCIEEM an ecologist with over ten years' commercial

experience who is proficient in carrying out botanical surveys and protected species assessments.

Phase 1 Habitat Survey

2.8 A habitat survey of the four strategic sites, including boundary features was carried out on 03 March 2015 following standard Phase 1 survey methodology (JNCC, 2010) whereby habitats were described and mapped. A habitat map also showing the results of the bat assessment of each strategic site is included in Appendix 3.

2.9 Incidental records of birds and other fauna noted during the course of the habitat survey were also compiled. Scientific names are given after the first mention of a species, thereafter, common names only are used. Nomenclature follows Stace (2010) for vascular plant species.

Phase 2 Botanical Survey

2.10 Based on previous surveys (Halcrow 2009a; 2009f) and the authors' personal knowledge of Shoreham Harbour, SS4 was known to support 'coastal saltmarsh' which is a habitat of principal importance.

2.11 Vegetation was described following standard NVC survey methodology outlined in *British Plant Communities* (Rodwell, 2000). The NVC survey focused on saltmarsh present within SS4 which was the only strategic site to contain this habitat. A mixture of saltmarsh and vegetated shingle plants were scattered across the regeneration area but these were not surveyed as they were very limited in extent and not recognised assemblages (Rodwell, 2000) of these habitat types.

2.12 Quadrats (sampling units of consistent size and shape) of 2x2m were taken of homogeneous areas of vegetation to ensure that the sample was representative of the site as a whole. Due to the slope and tidal zone 1x4m quadrats were used to account for the linear nature of the lower saltmarsh zone.

2.13 Samples were chosen on the basis of floristic and structural homogeneity of the vegetation, recording all vascular plants and bryophytes/lichens (where possible) and their cover/abundance using the DOMIN scale (see Table 1 below).

2.14 Quadrat locations were recorded using Global Positioning System (GPS). Additional information on environmental conditions, vegetation structure, plant associations and zonation, management and levels of human activity were also recorded.

Table 1: NVC DOMIN values and their % cover

Percentage Cover (%)	DOMIN Value
<4 - few individuals	1
<4 - some individuals	2
<4 - many individuals	3
4-10	4
11-25	5
26-33	6
34-50	7
51-75	8
76-90	9
91-100	10

2.15 Floristic tables were constructed from the data collected following the methodology in Mueller-Dombois & Ellenberg (1974). The data was analysed using the computer software programme MAVIS (Centre for Ecology and Hydrology, 2000) which provides the best statistical fit for the data, indicated by a probability co-efficient. The co-efficient indicates the degree of conformity (given as a percentage) with the 'classic' saltmarsh NVC community types described in Rodwell (2000). NVC community types were defined as those with a high probability co-efficient in combination with the community which best matched the floristic tables and descriptions of NVC communities and based on the author's professional experience.

2.16 The conservation status of all vascular plant, lichen and bryophyte species was established with reference to standard texts. This included checking against those species listed as threatened on the IUCN's *Vascular Plant Red Data List* (Cheffings & Farrell, 2005) and the *Red Data Book for Mosses and Liverworts* (Church *et al.*, 2001), those listed as nationally rare or scarce in Britain (Stewart *et al*, 1999; Preston *et al*, 2002) and those listed as 'county scarce' in *The Sussex Rare Plant Register* (Briggs Ed., 2001).

PROTECTED SPECIES ASSESSMENT

2.17 An assessment of each strategic site's potential to support protected species has been carried out, based on the results of the desk study, observations made during the site survey, an assessment of the suitability of on-site and adjoining habitat, and information on the distribution of these species. Those species considered potentially

present owing to the presence of suitable habitat within the site were evaluated further, as follows:

- the presence of nesting habitat for breeding birds, such as mature trees, dense scrub, hedgerows, and buildings, and vegetated shingle suitable for ground nesting birds; and evidence of bird nesting including bird song, old nests, faecal marks etc.;
- scrub/grassland mosaic and potential hibernation sites for widespread species of reptile;
- cover vegetation and ground topography suitable for badger *Meles meles* sett construction, as well as evidence of badger activity including runs, push-throughs, setts, hair and latrines;
- diversity/heterogeneity of habitat types with varied structure and mixture of foraging plant resources suitable for invertebrates; and
- coastal and estuarine habitats with eel grass beds and mixed algae growth suitable for short-snouted seahorses *Hippocampus* spp., but also including offshore gravels and man-made structures such as those found in harbours/marinas.

2.18 Great crested newts *Triturus cristatus*, hazel dormice *Muscardinus avellanarius*, water vole *Arvicola amphibius* and white-clawed crayfish *Austropotamobius pallipes* have been scoped out of the protected species assessment at an early stage following review of previous ecological assessments (see Table 2). It is not considered that the site has potential to support any other protected species and only those species listed above are included in the protected species risk assessment in Section 3 of this report.

2.19 The site was also assessed for its potential to support invasive plant species listed on Schedule 9 of The Wildlife and Countryside Act 1981 (as amended).

2.20 The likelihood of occurrence is ranked as follows and relies on the findings of the current survey and an evaluation of existing data.

- **Negligible** – while presence cannot be absolutely discounted, the site includes very limited or poor quality habitat for a particular species or species group. No local records from a data search, surrounding habitat considered unlikely to support wider populations of a species/species group. The site may also be outside or peripheral to known national range for a species.
- **Low** – on-site habitat of poor to moderate quality for a given species/species group. Few or no records from data search, but presence cannot be discounted on

the basis of national distribution, nature of surrounding habitats, habitat fragmentation, recent on-site disturbance etc.

- **Medium** – on-site habitat of moderate quality, providing all of the known key requirements of given species/species group. Local records form the data search, within national distribution, suitable surrounding habitat. Factors limiting the likelihood of occurrence may include small habitat area, habitat severance, and disturbance.
- **High** – on-site habitat of high quality for given a species/species group. Local records provided by desk study. The site is within/peripheral to a national or regional stronghold. Good quality surrounding habitat and good connectivity.
- **Present** – presence confirmed from the current survey or by recent, confirmed records.

2.21 The purpose of this assessment is to identify whether more comprehensive Phase 2 surveys for protected species or mitigation should be recommended.

BAT ASSESSMENT

2.22 An updated bat potential assessment of all built structures within the four strategic sites was undertaken by a licensed bat specialist. The bat potential assessment followed best practice guidance defined within the *Bat Conservation Trust Survey Guidance* (Hundt, 2012). A habitat map also showing the results of the bat assessment of each strategic site is included in Appendix 3, with bat assessment tables in Appendix 4.

Personnel

2.23 The assessment was undertaken by Charlie Dwight a Senior Ecologist with nine years commercial bat experience (Natural England Level 2 Class Licence). Charlie has lead a large number of commercial bat surveys and designs and implements mitigation measures in accordance with European Protected Species Mitigation (EPSM) licences.

Assessment Criteria - Buildings

2.24 All built structures that fall within the four strategic sites within the regeneration area were assessed in terms of their potential for bats. Each numbered building was subject to a visual assessment using Google Earth. The following criteria were used to determine the level of potential of each building for roosting bats:

- Negligible – While presence cannot be absolutely discounted there were no significant visible features that could be used by bats for roosting.
- Low – Small number of potential roosting features such as could be utilised by individual opportunistic roosting bats. Site situated within isolated habitat that could be used by foraging bats but which is not connected by prominent linear features such as woodland edge, hedgerows and tree lines.
- Moderate – Several potential roosting features in the buildings or other structures. There is surrounding habitat such as woodland, scattered trees, hedgerows suitable to support foraging and roosting bats. The site is connected with the wider landscape by linear features such as woodland edge, hedgerows and tree lines that could be used by commuting bats.
- High – Buildings or other structures, such as mines, caves, tunnels, ice houses and cellars, with numerous features of potential significance for roosting bats. Surrounding landscape has high value habitat for roosting, foraging and commuting that is contiguous with on-site habitats. The site is connected with the wider landscape by strong linear features and may be close to known roosts or other potentially valuable habitat resources.

ASSESSMENT OF GREEN INFRASTRUCTURE OPPORTUNITIES

2.25 An assessment of the potential to retrofit GI features was carried out by Ben Kimpton MSc, BSc, Dip(Hort) MCIEEM at the following 15 sites across the regeneration area:

- Wharf Road Embankment
- Basin Road North Embankment (East) - within SS1
- Basin Road North Embankment (Central)
- Frontage to Wellington Road (East) - within SS2
- Frontage to Wellington Road (West) - within SS3
- Basin Road North Embankment (West)
- Vale Park - outside regeneration area
- Basin Road North Embankment (Cemex)
- Frontage to Fishersgate Terrace (A259) / West Road
- Fishersgate Recreation Ground
- North Canal Bank below A259
- Frontage to Rock Close

- Frontage to Coats Court
- Kingston Beach
- The Ham

2.26 Information for each site, including summary description, photograph, boundaries and GI opportunities was captured using bespoke recording sheets which are included as Appendix 2. The location of each site is presented in Appendix 2 and also on the ECOP maps in Appendix 1.

LIMITATIONS

2.27 This report provides an evidence base for the JAAP, identifies the potential impacts of each strategic site and opportunties for GI improvements. It does not provide an impact assessment of the proposed works nor detailed information on compensation, mitigation and enhancement appropriate to each strategic site.

2.28 It is a strategic/high level assessment, reliant for the most part, on previous ecological assessments. Whilst every effort has been made to provide a comprehensive description of the site, this investigation cannot ensure the complete characterisation and prediction of the natural environment.

Data Search

2.29 It is important to note that, even where data is held, a lack of records for a defined geographical area does not necessarily mean that there is a lack of ecological interest, the area may simply be under-recorded.

2.30 Where only four figure grid references are provided for protected species by recorders submitting data, their precise location can be difficult to determine and they could potentially be present anywhere within the given 1km x 1km National Grid square.

Habitat Survey

2.31 The Phase 1 habitat survey does not constitute a full botanical survey, or a Phase 2 pre-construction survey that would include accurate GIS mapping for invasive or protected plant species. Large parts of the JAAP and strategic sites were not surveyed with access limited to public space. A review of aerial maps was, however, carried out to identify the broad habitats potentially present in unsurveyed areas.

Protected Species Assessment

2.32 The protected species assessment provides a preliminary view of the likelihood of protected species occurring on the site. This is based on the suitability of the habitat,

known distribution of the species, findings from previous ecological assessments and any direct evidence on the site. It should not be taken as providing a full and definitive survey of any protected species group. It is only valid at the time the survey was carried out. Additional surveys may be recommended if, on the basis of the preliminary assessment or during subsequent surveys, it is considered reasonably likely that protected species may be present.

Bat Assessment

2.33 Access to enable a physical internal and external inspection of each building could not be gained at the time of the bat assessment, as many of the buildings are privately owned and may not be subject to re-development (if any) for many years. Therefore the assessment was undertaken using as a desk based exercise only using Google Earth street view. Therefore the primary aim of the assessment was to provide the local planning authorities with an overview of likely bat potential when assessing individual planning applications that are relevant to the individual structures within the four strategic sites.

Assessment of Green Infrastructure Opportunities

2.34 Opportunities identified for GI provide only an indication of the type and location of enhancements and are not a definitive list. It is recommended that a specification for enhancements is provided on a site by site basis as required.

3 Results

DESK STUDY

Nature Conservation Sites

3.1 There are no European designated sites such as Special Areas of Conservation (SAC), Special Protection Areas (SPA) or Ramsar sites within the regeneration area. The closest SAC is Castle Hill, located approximately 9.45km to the east, whilst the closest SPA and Ramsar site are the Arun Valley (also designated a SAC), which is 20km to the north-west.

3.2 There are 15 nature conservation sites within a 3km radius of the site, including two statutory designated sites and 13 non-statutory designated sites. An account of all 15 sites is provided in Table 1 and Appendix A (Figure 1) of the *Shoreham Joint Area Action Plan Ecological Scoping Report* (Halcrow, 2009a).

3.3 Of particular relevance is the two statutory designated sites i.e. Adur Estuary SSSI and Shoreham Beach LNR as these are located adjacent to the regeneration area. Basin Road South SNCI (a non-statutory designated site) is also of relevance at it is adjacent to SS1.

Adur Estuary SSSI

3.4 The Adur Estuary Site of Special Scientific Interest (SSSI) is adjacent to the western boundary of the regeneration area and specifically SS4. The SSSI extends north for approximately 3km and is one of only four areas of extensive saltmarsh habitat within Sussex. The SSSI includes Adur Estuary RSPB reserve c.40 metres (m) to the west of the regeneration area on the opposite bank to SS4.

3.5 The estuarine plant communities of the SSSI are unusual due to the relative scarcity of cord-grass Spartina spp. Saltmarsh plants fringe most of the estuary and in places have colonised large areas of mudflats. At the landward margin of the saltmarsh a variety of herbs and shrubs are frequent, including mugwort *Artemisia vulgaris*, orache *Atriplex* spp. teasel *Dipsacus fullonum*, yarrow *Achillea millefolium* and elm *Ulmus procera*. The estuary embankment near the car park supports a large colony of common lizard *Zootoca vivipara*.

3.6 The large area of intertidal mudflats are important for a variety of wading birds, particularly redshank *Tringa totanus*, dunlin *Calidris alpina* and ringed plover *Charadrius hiaticula.* The number of ringed plover regularly exceed 1% of the total British population, making the estuary of national importance for this species. A variety of species breed within the reedbed adjacent to the estuary north of the A27, including moorhen *Gallinula chloropus*, reed warbler *Acrocephalus scirpaceus* and sedge warbler *Acrocephalus schoenobaenus* (Natural England, 2015).

3.7 The entire regeneration area is within the Impact Risk Zone (IRZ) for Adur Estuary SSSI. An IRZ provides an initial assessment of the potential risks to SSSIs posed by development proposals and where consultation with Natural England is expected. The types of development proposals to the west of the harbour mouth present the highest potential risk to the SSSI. The trigger list for consultation with Natural England includes residential development of 50 units or more (applicable for a small area immediately west of the harbour mouth), residential development of 10 units or more (applicable for areas adjacent to the SSSI i.e. within a c.45-200m zone) and any non-domestic planning application (for areas immediately adjacent to the SSSI i.e. within a c.45m zone).

Shoreham Beach LNR/SNCI and Basin Road South SNCI

3.8 The eastern end of Shoreham Beach SNCI (at Shoreham Old Fort) falls within the Harbour Mouth character area of the regeneration area. A large part of the SNCI is also designated as a Local Nature Reserve (LNR) whose boundary is adjacent to the regeneration area. The site's main interest is vegetated shingle, which includes a number of notable plant species. It also provides an important high tide roosting area for wading birds that have fed on the mudflats within the Adur Estuary SSSI (Morgan, 2006).

3.9 Basin Road South SNCI is located at the eastern end of the regeneration area, adjacent to SS1. The reason for designation is the vegetated shingle habitat present, being the largest of only three remaining areas (totalling 0.8ha) of this rare and internationally threatened[9] habitat in BHCC ownership. The vegetated shingle assessment (The Ecology Consultancy, 2015) has confirmed that the SNCI is

[9] listed on Annex 1 of the EC Habitats Directive as a habitat of international conservation importance

predominantly made up of imported materials and has undergone different periods of disturbance, which have reduced the overall extent of vegetated shingle habitat. The SNCI is 1.1ha in size and an estimate of the current extent of vegetated shingle is c.0.43ha with it concentrated to the north and south of the raised area. There is also an unconfirmed report for foraging black redstart *Phoenicurus ochruros* which is a rare bird in the UK (see Table 2). Areas of bare shingle and rubble are included as part of the SNCI because they form part of the vegetatation mosaic and are importance in maintaining its integrity.

3.10 Both of these SNCIs comprise habitat (viz. vegetated shingle) for a range of notable plants and are also known to contain widespread reptile species, including slow-worm *Anguis fragilis* and common lizard. Both sites have been identified as particularly vulnerable to damage from recreational pressure (trampling/erosion etc.) and are likely to be sensitive to changes in coastal processes.

Landscape Designations

3.11 The distribution of habitats of principal importance present across the south-east of England has been used to identify Biodiversity Opportunity Areas (BOAs) (The South East Biodiversity Forum, 2009). BOAs represent a targeted landscape-scale approach to biodiversity conservation in the county, form the basis for an ecological network, and provide opportunities for the restoration and creation of habitats of principal importance[10]. There are 75 BOAs across Sussex.

3.12 Basin Road South SNCI and Vale Park (adjacent to the regeneration area) form part of the Brighton and Hove Urban Green Network which is a local BOA covering approximately 647ha. Opportunities identified for this BOA that are relevant to harbour regeneration include; coastal habitat management, restoration and creation; education and community engagement; urban biodiversity and opportunities associated with development. The SNCI also forms part of the South Downs Way Ahead Nature Improvement Area.

[10] BOAs do not include opportunities for all habitats of principal importance present in the region or identify all areas where these could be applied. Work is still needed to develop opportunity areas in urban and marine environments in particular.

3.13 To the west Shoreham Estuary and Beach BOA connects to the site in two locations. The majority is outside the regeneration area, stretching north up the estuary and west along Shoreham Beach to Lancing, but the area around Shoreham Old Fort and the western end of SS4 are within the BOA. Opportunities identified for this BOA that are relevant to harbour regeneration include; minimising development impacts; invertebrate interest; coastal habitat management, restoration and creation and access improvements.

Birds

3.14 Shoreham Harbour is known to support a wide range of passage, wintering and breeding birds. This is evidenced in Table 2 below which summarises the findings from *Shoreham Harbour Winter Bird Survey* and *Review of the Birds of Shoreham Harbour* (The Ecology Consultancy, 2009a; 2009b). These findings provide a greater level of detail than the current SxBRC data search (which returned 32 notable species within a 1km radius of the regeneration area) as a wider search area and range of data sources were consulted.

Reptiles

3.15 The SxBRC data search provided records for three species of widespread reptile – slow worm, common lizard and grass snake *Natrix natrix* recorded in the locality as follows:

- Slow worm – 50 records dating 1988-2014, the nearest being a 2010 record within the regeneration area for Garner Road, Fishersgate (unspecified property);
- Common lizard – seven records dating 1988-1995, the nearest being an 1988 record 0.21km north of the regeneration area at 33 Kingston Lane, Southwick; and
- Grass snake – three records dating 1996-1999, the nearest being a 1996 record 0.13km north of the regeneration area at 7 Manor Close, Southwick.

3.16 Slow worm and common lizard have also been recorded within the regeneration area along an embankment parallel with the A259 - which corresponds to Enhancement Site 11 in Appendix 2 of this report. Table 2 below summarises the findings of the *Shoreham JAAP Reptile Survey Report* (Halcrow, 2009d).

Badger

3.17 Badger records are not provided as part of the SxBRC data search. Table 2 below summarises the records provided by Badger Trust Sussex to inform the *Shoreham Harbour JAAP Area - Summary of Phase 2 Ecological and Green Infrastructure Studies* (Halcrow, 2009f). Whilst this species was scoped out of further consideration in 2009, badgers are a mobile species and therefore the potential for them to have moved into the regeneration area in the intervening period cannot be ruled out. Optimum habitat within the regeneration area includes embankments along the railway and south of the A259.

Bats

3.18 Seventeen records were returned from the SxBRC dating 1994-2014, but 11 were for unidentified species. Nathusius' pipistrelle *Pipistrellus nathusii*, common pipistrelle *Pipistrellus pipistrellus* and noctule *Nyctalus noctula* were confirmed records. The closest record is from 1995 for an injured (grounded) noctule at Wellington Road, Portslade which is within the regeneration area.

Plants

3.19 The SxBRC data search provided records of 36 species of vascular and 13 species of lower plant listed on the Sussex Rare Species Inventory[11] (SxRSI). These are associated with a range of habitats including saltmarsh, grassland, arable and vegetated shingle. Of the vascular plants, five are species of principal importance and one (Childing pink *Petrorhagia nanteuilii*) is protected under Schedule 8 of the Wildlife and Countryside Act 1981 (as amended).

3.20 Fourteen SxRSI vascular plant species have been recorded with the regeneration area as follows:

- Seven records for Childing pink (2009-2013) - the closest being for sandy shingle on the north side of Shoreham Beach;

[11] Species selected according to strict criteria of rarity associated with their occurrence in Sussex. The SxRSI criteria includes – all species in the British Red Data Books including all Notable fauna and Nationally Scarce flora and British endemic taxa which have ever occurred in Sussex whether extinct or not; species included in the UK Biodiversity Action Plan (now referred to as species of principal importance); internationally rare taxa cited in the Bern Convention, IUCN Red Data Lists, or EU Habitats Directive which are not covered by any of the above and/or county rarities (Sussex Biodiversity Record Centre, 2015).

- Sea bindweed *Calystegia soldanella* (2007) - RNLI Lifeboat Station, Kingston Beach;
- Purple viper's-bugloss *Echium plantagineum* (2006) - Shoreham Beach SNCI;
- Sea-heath *Frankenia laevis* (2008) - vegetated shingle at Shoreham Harbour adjacent to the Marine and Fisheries Agency;
- Sea barley *Hordeum marinum* (2010) - vegetated shingle at Shoreham Harbour adjacent to Shoreham Power Station Office and Yard;
- Henbane *Hyoscyamus niger* (2010) - Kingston Beach;
- Golden-samphire *Inula crithmoides* (2006) - RNLI Lifeboat Station, Kingston Beach;
- Sea-lavender *Limonium procerum* (2009) - vegetated shingle at Shoreham Harbour adjacent to Parker Steel, Southwick;
- Five records for toothed medick *Medicago polymorpha* (2003-2011) – the closest being opposite Hove Lagoon in SS1 and at Kingston Beach;
- Curved hard-grass *Parapholis incurva* (2007) - vegetated shingle at Basin Road South SNCI adjacent to SS2;
- Early meadow-grass *Poa infirma* (2007) - Kingston Beach;
- Perennial glasswort *Sarcocornia perennis* (2003) - western end of SS4 adjacent to Sussex Yacht Club;
- Six records for starry clover *Trifolium stellatum* (2010-2013) - vegetated shingle at Shoreham Beach SNCI; and
- Yellow vetch *Vicia lutea* (1997) - vegetated shingle at Shoreham Beach SNCI.

Invertebrates

3.21 Seven priority species have been recorded within the regeneration area. The butterfly white-letter hairstreak *Satyrium w-album* (UK priority species) has been recorded for the 1km OS grid square covering Aldrington Basin. Grey bush cricket *Platycleis albopunctata* (nationally scarce) has been recorded twice (2008 and 2013) at The North Canal Bank which corresponds to Enhancement Site 11 in Appendix 2.

Great crested newts

3.22 Table 2 below summarises the findings from the *Shoreham Harbour and Adur District Great Crested Newt Pond Survey* (Halcrow, 2009c) for which the nearest great crested newt record returned was the same as the current SxBRC data search. This is 1993

record from The Meads, Victoria Road in Shoreham which is 0.61km north-west of regeneration area (not 400m as stated in Table 2).

Fish

3.23 The River Adur is known to support a wide range of fish species including flounder *Platichthys flesus*, eel *Anguilla anguilla*, grey mullet *Liza ramada*, sand smelt *Atherina presbyter* and bass *Dicentrarchus labrax*, present in the estuary during summer and autumn, and tench *Tinca tinca*, bream *Spondyliosom cantharu*, carp *Cyprinus carpio*, chub *Squalius cephalus*, roach *Rutilus rutilus* and rudd *Scardinius erythropthalmus* present upstream in the freshwater river. Sea trout *Salmo trutta* are also known to migrate through the estuary to spawning grounds in the catchment headwaters (Ouse and Adur River Trust, 2014).

Existing Ecology, Open Space and Green Infrastructure Reports

3.24 Table 2 below provides a summary of key findings from previous ecological, open space and green infrastructure reports that are relevant to this study. It should be noted that 2009 studies were based on a wider regeneration area than is currently proposed, with a significantly higher level of development and land reclamation along the seaward side of the harbour.

Table 2: Summary of Existing Ecological, Open Space and Green Infrastructure Reports

Relevant findings from ecological, open space and green infrastructure reports
Shoreham Harbour JAAP - Assessment of Open Space, Sport and Recreation Study (PMP, 2009) The original Open Space, Sport and Recreation Studies (including Playing Pitch Strategies) for Adur and Worthing were carried out in 2005 and 2006 respectively. Both Strategies were partially reviewed in 2009. Adur and Worthing Open Space Study (see below) replaces this set of reports, which predominately focused on identifying local needs in relation to quantity and accessibility of open space, sport and recreation provision.
Adur and Worthing Open Space Study (Knight Kavanagh & Page, 2014), Adur and Worthing Open Space Study Standards Paper (Knight Kavanagh & Page, 2014a) Three quarters of all open spaces score high for quality. More amenity greenspace and natural and semi-natural sites score low for quality compared to other typologies due to sites of this type tending to lack ancillary features. The majority of all open spaces are assessed as being of high value. Reflecting the importance of provision; nearly all sites with the exception of some for the typologies of amenity greenspace and natural and semi-natural score high for value. All parks are assessed as being of high value, with the important social inclusion and health benefits, ecological value and sense of place these sites offer being acknowledged. The majority of these sites (71%) score high for quality rather than low. All provision in the Southwick and Fishergate analysis areas scores high for quality, but half of the sites (all moorings) in Shoreham-by-Sea score below the threshold. This study identified eight natural and semi-natural green spaces that may be affected by regeneration at Shoreham Harbour. Natural greenspace sites are generally viewed as being of a good quality by respondents (35%). This is reflected in the audit assessment with the majority (71%) scoring above the threshold. The majority of natural and semi-natural greenspace (90%) scores high for value. However, there is quite a considerable spread; 57%, between the lowest and highest scoring sites. As well as providing important nature conservation and biodiversity value, many natural and semi-natural sites in Adur and Worthing are well used for recreational purposes and are a valuable open space resource. The highest scoring site for value is Shoreham Beach (72%) which is well used by a variety of groups, offering a typical beach site but also being popular for cycling and walking within an attractive setting. In addition to the multifunctional role of sites, amenity greenspace provision is, in general, particularly valuable for the visual aesthetics of residential areas. This is demonstrated by the 76% of sites which score high for value. The contribution these sites provide as a visual amenity and for wildlife habitats should not be overlooked. A number of open space sites are likely to have a secondary role similar to green corridors. Within the regeneration area this includes Lancing Beach to Shoreham/Shoreham Old Fort and port authority/Southwick Beach to Adur/Southwick Promenade. The biggest contributors to activities associated with green corridor provision are the combined sites that make up the seafront (Beach and Foreshore). This collection of sites forms a single connected 'corridor' in theory enabling travel from the western end of Worthing to Shoreham. The Open Space Standards Report identified the total new provision required to meet future population projections in Shoreham-by-Sea as follows: Parks and Gardens 1.62ha, Natural and Semi-natural Greenspace 5.14ha, Amenity Greenspace 1.71ha. For Southwick and Fishersgate the projections are: Parks and Gardens 0.1ha, Natural and Semi-natural Greenspace 3.58ha, Amenity Greenspace 1.87ha. In regards to green corridors, Recommendation 6 states, "*due to their (generally) linear nature, it is not appropriate to set provision standards in terms of quantity and accessibility. Instead policy should promote the use of green corridors to link existing open spaces, housing areas to cycle routes, town centres, places of employment and community facilities such as schools, shops, community centres and sports facilities. Opportunities to use established linear routes, such as river banks and national networks, as green corridors should also be explored".* The amount of new provision required in hectares for Shoreham Harbour regeneration was quantified, but with the exception of parks and gardens (1.76ha) each typology was thought to be sufficiently covered by the catchment areas. Furthermore, due to the number of existing amenity greenspace and natural and semi-natural greenspace sites (particularly in the Marine Ward), an option could be to improve and formalise these existing sites in order for them to meet the identified gap. Also, given its position it may be difficult to create new forms of natural and semi-natural greenspace and amenity greenspace.
Shoreham Joint Area Action Plan Ecological Scoping Report (Halcrow, 2009a) JNCC Phase 1 habitats recorded within the current regeneration area included urban land-use types (buildings, hardstanding, transport infrastructure, gardens etc.), amenity grassland, coastal grassland (described as a best fit category encompassing a range of relatively unmanaged grassland types), scrub, intertidal cobbles/shingle, vegetated shingle, continuous salt-marsh and brackish open water. Key habitats identified which are sensitive to potential impacts of the current scheme included: coastal saltmarsh, intertidal mudflats, coastal grassland and open brackish water areas, all of which may meet the criteria for priority habitats. The potential presence of protected and notable species within the current regeneration area was assessed as follows: • Bats – likely to be present and may roost in buildings within the development; • Badgers – may be present in the area particularly along the railway embankment, but no setts or other signs of badger activity were identified within the site survey area; • Dormice – likely to be absent due to lack of suitable habitat within site survey area; • Great crested newts – possibly present within regeneration area; • Invertebrates – coastal grassland and vegetated shingle habitat areas may provide suitable habitat for a variety of terrestrial invertebrates including notable species; • Nesting (and wintering) birds – present; • Reptiles – likely to be present within suitable habitat such as coastal grassland and vegetated shingle across the regeneration area, but this is limited within strategic sites; • Short-snouted seahorse – may be affected by works in the Canal and along the harbour edge as potentially present within the harbour; • Water vole – likely to be present at the western end of the site survey area, but suitable habitats unlikely to be impacted by proposed scheme. Scoped out from any further consideration; • White-clawed crayfish – Likely to be absent due to lack of suitable habitat within site survey area; and • Invasive plant species – none recorded during survey. Further surveys for winter birds, short-snouted seahorse, reptiles, great crested newts, bats, breeding birds (where there is a possibility of active bird nest being disturbed), the sea bed (within the proposed reclamation area and its surround) and a vegetated shingle survey (within the reclamation area) were recommended. It was also recommended that a review of the modelling study of coastal processes following coastal reclamation work should also be undertaken by an ecologist in order to predict potential biodiversity impacts on coastal habitats/designated sites and sea bed habitats. This should take into account any potential for damage to inter tidal habitats, and the Environment Agency (EA) and the Sussex Sea Fisheries Committee should be consulted specifically with regard to this matter. In addition, new priority habitats should be created elsewhere within the site or off site to compensate for any residual negative impacts resulting from this scheme. The main example cited was the creation of on-site areas of vegetated shingle and the realignment of tidal embankments outside of the development areas, such as EA projects upstream on the Adur - identified through personal communication with Carol Pierce (NEAS Officer). Through liaison with Natural England (NE) it was determined that greenspace provision in the Shoreham Area is currently below recommended standards (ANGSt standards), and that the current deficiency and future provision should be addressed through a Green Infrastructure (GI) Strategy. Nature conservation features within and adjacent to the regeneration area were evaluated as being of value at varying levels i.e. from local (e.g. coastal grassland along the north side of the Canal) through county (e.g. Shoreham

Table 2: Summary of Existing Ecological, Open Space and Green Infrastructure Reports

Relevant findings from ecological, open space and green infrastructure reports
Beach SNCI/LNR and refuge afforded to winter birds by the Canal) up to national importance in the case of Adur Estuary SSSI. Potential impacts from the proposed scheme were considered significant on a number of these features, including the species; bats, birds, reptiles and marine fauna, the habitats; saltmarsh, intertidal mud and coastal grassland (within the SSSI), vegetated shingle, sea bed habitats and coastal grassland north of the Canal and the designated sites; Shoreham Beach SNCI/LNR, Widewater Lagoon SNCI and Basin Road South SNCI. It did, however, include the impact of land reclamation on the seaward side of the harbour, which does not form part of current proposals. The effects of coastal squeeze were considered, but it was anticipated that future flood management policy will be to maintain defences [sheet piling] in their current locations and not extend their footprint into the intertidal zone. However, flood management options outlined in the Shoreham Harbour Flood Risk Management Guide SPD and its Technical Annexe (see Table 3 below) include incursion into the intertidal zone. The incorporation of design enhancements (such as replacement of some sections of sheet piling with more environmentally friendly alternatives such as terracing or the creation of new areas of intertidal habitat) into the scheme to ameliorate the effects of coastal squeeze were mentioned. It was recommended that further consultation with statutory and non-statutory consultees (e.g. Sussex Wildlife Trust (SWT), NE and the EA) is undertaken at each stage of the project as scheme details are refined, to agree mitigation measures for protected species/habitats. This will aid in the development of design proposals and mitigation plans for the development.
Shoreham Joint Area Action Plan Bat Potential Scoping Survey (Halcrow, 2009b) A survey of the regeneration area including a number of additional off-site areas was carried out, sub-divided into 10 different sections. It included an assessment of general built structure construction types within each section and of the potential foraging opportunities for bats within the surrounding landscape. Sections 1 – The Harbour Area (Low Potential), Section 2 - Portslade to Shoreham Town Centre (Medium Potential) and Section 3 – Industrial Units in strategic site 2 (Low/Medium Potential) relate to the regeneration area. No further bat surveys were considered necessary for sections (and built structures within them) defined as having low potential for roosting bats and were scoped out. Four sections were considered to be (partially or entirely) of medium or high potential for roosting bats including Section 2 and 3 and further bat surveys (bat activity transect surveys) were recommended at the relevant locations within these sections at the optimum time of year (May – August inclusively). Where bat activity is found to be high, built structures within the vicinity of high bat activity should be subject to a thorough internal and external inspection by a licensed bat specialist. If any of the structures scheduled for demolition are confirmed to be in use by roosting bats, then a European Protected Species Mitigation (EPSM) Licence detailing an appropriate level of on-site mitigation will be required, prior to demolition works commencing.
Shoreham Harbour and Adur District Great Crested Newt Pond Survey (Halcrow, 2009c) This study concluded that there is a general lack of ponds and other standing water bodies within the study area. It identified four standing water bodies, one of which was in-filled and the remainder considered unsuitable for great crested newts (GCN) and/or are highly isolated from any suitable areas of terrestrial habitat or suitable GCN breeding ponds. The nearest GCN record (from 1993) was 400m away and despite no suitable breeding ponds found in the vicinity of this record, there remains a low possibility of GCNs still existing in this area. However, it is considered that due to the distance (approximately 400m) from the regeneration area, and the very low ecological connectivity and presence of major barriers to dispersal (railway and busy roads) that GCNs originating from here are very unlikely to be found within the regeneration area. There is also a low possibility that inaccessible ponds in domestic gardens containing GCNs may exist in other parts of the study area. This is very unlikely to be the case within the regeneration area itself where domestic gardens are very limited in size, and once again due to the extremely low ecological connectivity throughout the area there is considered to be a negligible risk of any adverse impacts on this species as a result of the proposed development activities. Consequently a full great crested newt survey will not be required and this species was scoped out from any further consideration.
Shoreham JAAP Reptile Survey Report (Halcrow, 2009d) A reptile survey was carried out at two south-facing grass banks located on the northern side of Shoreham Harbour (East Arm), south of the A259 between Station Road in the west and Hove lagoon in the east. The largest bank (A) was 1.1km in length from TQ 2450 0503 (east of Station Road) to TQ 2553 0501 (west of Mill Road) and corresponds to Enhancement Site 11 in Appendix 2 of this report. Five further separated smaller areas of grassland are located at; TQ 2566 0497 (B), TQ 2599 0493 (C), TQ 2641 0480 (D - which corresponds to Enhancement Site 3 in Appendix 2 of this report), TQ 2668 0479 (E) and TQ 2691 0474 (F). Area A comprised the best quality habitat for reptiles, with a diverse range of long and short grass, frequent scrub patches of various sizes and open areas. Of the five smaller grass banks only Area D was considered suitable. Following Froglife (1999) methodology for population assessments, peak counts indicated the presence of an exceptional population of common lizards (greater than 20 individuals) and a good population of slow worms in Area A. Areas B-F were considered less suitable than Area A both in terms of range of habitat features and their extent. No reptiles were recorded in Area D and consequently reptiles were considered probably absent from Areas B, C, E and F, although the possibility of reptiles occurring here cannot be ruled out. If reptiles are present in these smaller areas they would be highly vulnerable to extinctions due to their small size and isolation. It was noted that reptile populations are present in other locations around the periphery of Shoreham Harbour; notably at Shoreham Fort and on the north and south sides of Shoreham Beach and that these individual populations are likely to be relics of a more extensive population which may have connected all of these areas where suitable habitat existed. Based on this, it is considered that there is scope to enhance the status of reptile populations around Shoreham Harbour by connecting up some or all of the suitable sites and improving the quality of the habitat where required. Results of this survey are considered to remain valid for a period of 2-3 years and if impacts are likely to occur at Areas B, C, E and F a reptile survey would be required to establish likely absence at these sites (Due to the age of results it is also considered that repeat reptile surveys are recommended at Area A and D).
Shoreham Harbour Winter Bird Survey (The Ecology Consultancy, 2009a) The survey identified a medium to high diversity of bird species (41) including 25 species listed as Birds of Conservation Concern (BoCC), six of which are priority species. Locally significant numbers of some species such as purple sandpiper *Calidris maritima* and kingfisher *Alcedo atthis* were recorded. The most important areas for birds are the harbour mouth, where there is a high tide roost of purple sandpiper and turnstone, and the saltmarsh and mudflats immediately to the east of Adur Ferry Bridge which is frequented by small numbers of waders (ringed plover, grey plover, dunlin and redshank) at low tide. Southwick Basin, by comparison, is relatively species-poor; small numbers of mute swan *Cygnus olor*, red-breasted merganser *Mergus serrator*, little grebe *Tachybaptus ruficollis*, cormorant *Phalacrocorax carbo* and kingfisher frequent this deep water canal though the complete absence of muddy substrates makes it unsuitable for waders. Purple sandpiper is a scarce winter visitor to Sussex (James, 1996) occurring regularly at only four sites in the county including Shoreham Harbour. The presence of up to eight birds at Shoreham Harbour over the winter of 2008/09 is locally significant especially as a Non-estuarine Coastal Waterbird Survey (NEWS) in 2006-2007 recorded only 11 birds along the whole of the Sussex coastline (Crabtree & Newnham, 2008). In winter, many kingfishers move from inland areas to the Sussex coast, particularly in cold weather (James, 1996). Given that kingfishers are often unobtrusive and that up to two birds were recorded on four of the survey dates, it is likely that the sheltered Southwick Canal provides an important winter refuge for this amber-listed species. Of the six priority species only herring gull *Larus argentatus* and house sparrow *Passer domesticus* were observed in numbers that would be considered locally significant. Totals of over 500 herring gulls were recorded on two survey dates, the majority observed roosting on warehouse roofs suggesting that development will have little impact on this species. Up to 16 house sparrows were observed in hedgerows adjacent to Hove Lagoon. It is likely that significant numbers of this red-listed species feed around the grain silos along Basin Road South though this could not be confirmed due to a lack of access.

Table 2: Summary of Existing Ecological, Open Space and Green Infrastructure Reports

Relevant findings from ecological, open space and green infrastructure reports
Review of the Birds of Shoreham Harbour (The Ecology Consultancy, 2009b) The area covered by this review included Hove Lagoon, Southwick Canal, Southwick and Shoreham beaches, the River Adur north to the A27 and Widewater Lagoon. Sussex Ornithological Society records (1998-2007) included 168 bird species in Shoreham Harbour regeneration area. Of these, 11 were species of high conservation concern (BoCC Red List) and 87 of medium conservation concern (BoCC Amber List). The main ornithological features of the regeneration area are the large number of transient passage species recorded, the concentrations of wintering waders and the presence of black redstart as a breeding bird, at least in some years. Taken as a whole, the area appears to be of regional importance for passage species, county importance for wintering species (especially waders) and local importance for breeding birds. In some years, however, it may be of regional importance for black redstart – a rare breeding species (Thomas (Ed.), 2014). It should be recognised, however, that the terms 'regional', 'county' and 'local' have not been precisely defined under the methodology followed (Fuller, 1980) and they cannot assume any significance in relation to administrative areas. They are intended only as a rough indication of the geographical level at which a site is likely to assume value. The Local Plan Harbour Area is likely to be of 'local importance' only in that most of the concentrations of wintering waders at Shoreham Harbour are found outside its boundaries and also because the availability of habitat for passage species is limited. It was recommended that a survey be undertaken to determine the breeding status of black redstart at Shoreham Harbour. This is an unobtrusive species which is easily overlooked. The warehouses and compounds that lie adjacent to Southwick Canal would appear to offer plenty of suitable breeding habitat.
Shoreham Harbour Regeneration Seahorse Survey Report (Emu Limited, 2009) Survey for seahorses within Shoreham Harbour and intertidal and subtidal surveys along the eastern seaward side of Shoreham Harbour were carried out. Both the species of seahorse found in Britain, *Hippocampus hippocampus* and *H. guttulatus*, are known to occur in the English Channel. No seahorses were found during the current survey; however, the presence of potential seahorse habitat and anecdotal sightings off Shoreham suggest that seahorses are very likely to be found in the area. The level of sampling conducted suggests that if they do occur in the area surveyed they are only likely to be present in low numbers. The biotope mapping method used was based on the Marine Nature Conservation Review (MNCR) field recording techniques. A total of 12 biotopes, six biotope complexes and one habitat complex were identified across the whole of the survey area. The intertidal area was predominantly sedimentary, with some small areas of scattered natural boulders exposed at extreme low tide. The general biotope zonation pattern within the intertidal was barren littoral shingle (LS.LCS.Sh.BarSh) along the upper shore, barren littoral coarse sand (LS.LSa.MoSa.BarSa) on the mid shore and polychaetes in littoral fine sand (LS.LSa.FiSa.Po) on the low shore. These biotopes are typical of exposed habitats, subject to a high degree of sediment disturbance and have naturally impoverished communities. The richest habitats were found on the scattered natural boulders and on the artificial structures on the mid and low shore. The intertidal biotopes identified within the survey area are not considered to be scarce or rare in the UK. Within the subtidal survey area potential Annex 1 rocky reef and blue mussel *Mytilus edulis*, reef habitat were found. Such reef habitat is protected under the EC Habitats Directive as a Habitat of International Conservation Importance. While the area surveyed does not hold any designations for nature conservation, there are two existing areas of conservation importance in close proximity to the survey area and the proposed development. A separate study is required to determine the likely sensitivities and responses of the habitats and species to the proposed development activities. This would require provision of details of construction techniques and operational activities, including an estimation of the physical consequences of these activities.
Shoreham JAAP Vegetated Shingle Survey Report (Halcrow, 2009e) Three areas of vegetated shingle located along the eastern harbour arm were surveyed, representing a resource approximately 3.3ha in extent: Site 1 - Carat's Café car park (TQ 21484 04751 to TQ 24663 04752), 0.18ha; Site 2 – Mid beach west of power station (TQ 25045 04749 to TQ 25593 04685), 0.85ha and Site 3 – West of Western Esplanade (TQ 26093 04600 to TQ 26596 04566), 2.3ha. (Note: the eastern half of Site 3 is designated as Basin Road South SNCI). All of the areas were found to support a high diversity of plant species (77 species recorded at Site 1 and 86 species across all three sites), including a range of typical maritime and shingle species. The plant species recorded include: numerous Red Data Book 'Least Concern' species, several plants listed in the Sussex Rare Plant Register, one UK BAP Priority species and one Red Data Book 'Near Threatened' species. Sampled vegetation at all three sites was classified as SD1a *Rumex crispus-Glaucium flavum*; typical sub-community, although the vegetation does not match the published type particularly well, and there are affinities with MC5 *Armeria maritima-Cerastium diffusum* ssp. *diffusum* Maritime Cliff therophyte community. Mitigation measures should be put in place to avoid, reduce or compensate for potential adverse impacts on this habitat. This is likely to involve the creation of an allocated area where vegetated shingle may develop naturally (or to which it can be translocated). An ecologist, in consultation with stakeholders, should produce a detailed strategy setting out any mitigation/ compensation measures. Where recommended mitigation measures are followed is it is anticipated that residual impacts on this habitat may be negligible in the medium to long term.
Adur District Green Infrastructure Wildlife Corridors Study (Halcrow, 2010) Two existing green corridors following major routes were identified as: • National Cycle Route 2 along the coast linking Shoreham with Worthing to the west and Brighton to the east. From Brighton the route follows the coastline in Portslade along South Basin Road crossing Shoreham Harbour over the locks. It continues along the public roadway and crosses the western harbour at Adur Ferry Bridge; and • Regional cycle route 79 following the Adur River valley connecting Horsham to the south coast at Shoreham. Within the study area, much of the route is off road. Within the regeneration area and western Brighton & Hove, there are three corridors providing important wildlife links and some public access. They are located from: • Southwick Hill to Fishersgate – public access throughout although very narrow in parts of urban area; • Foredown Hill to Vale Park (14) – series of green spaces with intermittent public access; and • Benfield Valley (9) linking Downs to Old Shoreham Road with consistent public access. . The GI study has identified the following biodiversity opportunities in parks and open spaces within or adjacent to the regeneration area: • To create more wildlife planting and reduce mowing regimes where appropriate and to integrate these proposals as part of a biodiversity management plan for open spaces, if this does not already exist; • To create habitats for amphibians by creating ponds in urban areas and on South Downs (both are lacking at present in the area); • To link neighbouring parks, open spaces, cemeteries and school grounds as wildlife corridors with connections along roadways and private land where feasible; • To recreate suitable habitats and interpretation for notable breeding birds e.g. ringed plover and peregrine; • To protect species-rich grassland between Shoreham Harbour East Arm and A259, and to incorporate this valuable habitat into open space plans for a future waterfront park and open spaces; and • To create new open spaces and enhance existing habitats at Shoreham Fort and Kingston Beach.

Table 2: Summary of Existing Ecological, Open Space and Green Infrastructure Reports

Relevant findings from ecological, open space and green infrastructure reports
Opportunities for new development areas and across the regeneration area include providing: • Green corridors from the Downs to the sea shore *viz.* Southwick Hill, Foredown, Benfield Valley etc.; • Green corridor linkages in new development especially as they are likely to lack extensive open space and therefore access to the wider open space network will be important; • Improved links to existing green corridors along National Cycle Routes; • Areas of wildlife enhancement as well as providing a stronger landscape structure of trees and shrub planting providing a defined edge to developments and reinstating hedgerows and other vegetated areas that have become denuded; • Green roofs as wildlife habitats, to capture rainfall and reduce excess run-off and improve year round insulation; • Reconfigure the existing A259 to improve the pedestrian and cycle experience and access to the waterfront. This could become a major green corridor running in parallel to the existing National Cycle Route 2 and incorporating the area of coastal grassland; • Create improved pathways, signage and sensitive lighting through the existing green corridors; • Shoreham Harbour expansion (not part of the current proposals for harbour regeneration) creates a new foreshore with possibility for improved public access for walkers and cyclists; and • Create new links through Fishersgate and Portslade to the sea, some of which may be possible with future planned developments in regeneration area.
A Green Network for Brighton & Hove (Sussex Wildlife Trust *et al.*, 2009) This study identified the same two green corridors in western Brighton as *Adur District Green Infrastructure Wildlife Corridors Study* (Halcrow, 2010) above i.e. Foredown Hill to Vale Park and Benfield Valley which links The Downs to Old Shoreham Road. One 'Core Area' (designated wildlife sites) is identified within the JAAP under B&HCC ownership i.e. Basin Road South SNCI. Public open spaces adjacent to the regeneration area in south Portslade including Vale Park and Victoria Recreation Ground are categorised as 'buffer areas' which protect core areas from adverse external influences and include sports pitches and other leisure uses where biodiversity is incidental. 'Connection zones' linking these buffer areas are also identified where urban greening and habitat creation is a priority e.g. sections of urban roads, housing and industrial estates where biodiversity enhancements could be undertaken e.g. tree planting; green verge creation, widening and planting; traffic control and creation of 'home zones' and incentives to enhance private gardens. Connection zones might also include spaces or parts of spaces with other primary uses such as public parks and school grounds. Development within the regeneration area should consider the existing and potential function that these areas perform, particularly in terms of nature conservation and wildlife.
Shoreham Harbour JAAP Area - Summary of Phase 2 Ecological and Green Infrastructure Studies (Halcrow, 2009f). This document provides a summary of findings from surveys recommended in the Ecological Scoping Report (Halcrow, 2009a), further [outstanding] surveys going forward, consultation with stakeholders and opportunities for receptor site locations and potential enhancement areas. Badger Trust Sussex confirmed that there is no record of any setts within the regeneration area, although badger activity was found in the area of the cemetery off Trafalgar Road at TQ25815 05505. This is believed to have been a solitary animal, possibility evicted from a sett north of the Old Shoreham Road off Locks Hill. No further signs were observed subsequent to this, and a badger was killed on the railway close by around this time (presumed to be the same animal). A large fox earth exists on the railway embankment just beyond Trafalgar Road but it is not thought that any badgers have used it. In conclusion, there is no indication that any badger setts occur within the regeneration area and this species was scoped out from any further consideration. *Shoreham JAAP Habitats Regulations Assessment Screening Report* (Ecological Planning and Research, 2009) identified that increased water abstraction due to new housing in the regeneration area would potentially reduce groundwater levels within the Worthing Chalk Block aquifer, and could consequently have an adverse effect on the Natura 2000 site - Arun Valley Special Protection Area and Ramsar site. Based on this finding the report recommends that an Appropriate Assessment should be undertaken. This is based on "*predicted increases in water abstraction*", but goes on to recognise that "*further information, for example Southern Water's Final Water Resources Management Plan* [WRMP], *may provide the necessary reassurance that the predicted increase in water demand can be met without impacting on the designated site*". Southern Water's revised draft WRMP actually predicts a reduction in water demand in the area even with expected increases in population taken into account. Halcrow go on to comment that the latest revised WRMP currently represents the best estimates of water demand in the area and should be taken into account in deciding the need for an Appropriate Assessment. **[Please note that the HRA screening process for the Adur Local Plan and Brighton & Hove City Plan has considered the potential effects on sites protected under the European Habitats Directive (Directive 92/43/EEC) and Wild Birds Directive (Directive 2009/147/EC). It concluded that there will be no significant impacts on protected European sites and that an Appropriate Assessment is not required for either of these plans or the Shoreham Harbour regeneration area. In agreement with Natural England, a Habitats Regulation Statement has been produced to summarise this position and a statement to this effect will be published with the proposed submission JAAP].** Recommendations for additional further survey work includes bats, breeding birds, reptiles and an investigation of potential impacts on coastal habitats due to reclamation works (this investigation was pending as modelling study had not been carried out at this stage). In regards to a breeding bird survey its states that this is especially important for Southwick and Shoreham beaches which are known to support small breeding populations of ringed plover, despite excessive human disturbance in these areas. The grass bank along Southwick Canal should also be focused on as this is likely to support a number of declining breeding bird species such as linnet *Carduelis cannabina* and starling *Sturnus vulgaris*. The need for black redstart surveys as discussed above is restated. In regards to the potential impact to birds, invertebrates and other wildlife species occurring within the harbour and intertidal areas due to replacement piling it is recommended that a separate assessment of environmental impacts is undertaken with regard to these works in order to avoid any adverse effects. It is not thought, based on findings of the marine surveys that further surveys using divers would be likely to encounter seahorses due to the likelihood of them occurring at low densities even if they are present. However, it was qualified that this may be required by NE. A separate study will be required to determine the likely sensitivities and responses of the important habitats identified in the subtidal zone and their associated species to the proposed development activities. This would require provision of details of construction techniques and operational activities, including an estimation of the physical consequences of these activities. The *Adur District Green Infrastructure Wildlife Corridors Study* identified a number of opportunities for the creation of new green corridors and enhancing biodiversity. A more detailed study is required to take forward the recommendations and to tie them into the future development plans, programming and funding streams.

Table 2: Summary of Existing Ecological, Open Space and Green Infrastructure Reports

Relevant findings from ecological, open space and green infrastructure reports
All vegetated shingle (c.3.3ha) may potentially be lost or heavily impacted by the proposed scheme. In the absence of any mitigation or compensatory measures this would be a significant impact potentially resulting in the loss of an area of UK BAP Priority and EC Annex 1 habitat containing a number of uncommon plants which comprises an ecological feature of value at the district level. Mitigation and/or compensation measures should be put in place to ensure that areas and condition of vegetated shingle are maintained or enhanced following the proposed development. It may be appropriate to undertake partial or complete translocation of some or all of the vegetated shingle habitat where avoidance or sufficient reduction of impacts is not possible. A receptor site or an allocated area where new vegetated shingle habitat could develop would be required and should be incorporated within the proposed scheme design. A method statement/mitigation strategy should be produced and approval by stakeholders and two years monitoring implemented. Outline enhancement and receptor site options presented were: • New foreshore surrounding the reclamation area [not part of the current proposals for harbour regeneration] to include replacement sections of sloping shingle beach for breeding ringed plover; • Breeding and forging habitat (the latter being more important) suitable for black redstart is incorporated into the scheme design; • Maintain and enhance ecological value of North Canal Bank, but where unavoidable impacts on reptiles are likely, to translocate to an appropriate site. A number of potential receptor sites were identified including Lancing Brooks grassland areas/ Adur Recreation area and tidal section of the River Adur; • Allocation within the proposed reclamation area [not part of the current proposals for harbour regeneration] of an area for natural vegetated shingle establishment and/or as a receptor site for any translocation work; • Inclusion of areas of vegetated shingle habitat within the general landscape of the new development independent of any mitigation/compensation requirement. The example by Scottish Power at Shoreham Power Station should be followed by any new developments on the harbour arm/reclamation area; • Create new off-shore wader roosts and sub-tidal reef habitat as part of the land reclamation area [not part of the current proposals for harbour regeneration]; and • Ecological networks and green roofs/nest boxes as part of new development areas. It was concluded that a full Environmental Impact Assessment (EIA) will be required for a development scheme of this scale. The surveys detailed within this and accompanying reports will provide baseline information for this study. The EIA will utilise and collate all of the ecological survey information and will provide a formal assessment of likely impacts on ecological features in the context of other potential impacts.
Shoreham Harbour Joint Area Action Plan Strategic Environmental Assessment (SEA) and Sustainability Appraisal (SA) - Ecology Baseline Information (Ecological Planning and Research, 2009) Five potential options for the scale of development under the JAAP were tested by the SEA/SA to determine the most sustainable option for future development. The predicted zone of influence and hence the study area for this SEA/SA was 5km landward in each direction of the regeneration area and 2km south as a marine buffer zone. This report did not include marine habitats and species within the study area as these have been addressed in a later phase of the SA/SEA. During consultation, NE stated that the eastern arm of Shoreham Harbour (Southwick Canal) is an important area for birds due to its sheltered nature and that there is a need to ensure that the width and form of the canal is maintained to preserve biodiversity. Main Ecological Features Within the Boundary of the regeneration area: There are large areas of urban land use in the regeneration area where the main ecological feature potentially impacted are bat roosts. Further information would need to be gathered on the status of bat roosts prior to development proceeding in order to fully evaluate their importance and inform avoidance or mitigation measures where necessary, particularly for the demolition of structures potentially supporting bat roosts. In terms of terrestrial protected species, further surveys at project level will be required to ascertain the presence or likely absence of other protected species within the regeneration area, in particular GCN, badger [subsequently ruled out through consultation with Badger Trust Sussex] and the widespread reptiles species (although the HSI Assessment – see above) suggests that they may be absent from the regeneration area itself. Loss of habitats used by these species in the absence of mitigation may impact on the conservation status of species within the local area. Other features that are considered to be of ecological value within the regeneration area include habitats and species associated with the River Adur shoreline and sea. Impacts on these features should be taken into account when considering the options for the regeneration area. Habitats considered to be most vulnerable include; vegetated shingle; intertidal mudflats and saltmarsh. Main Ecological Features Within the Study Area: Ecological features outside of the regeneration area but within the study area that could potentially be impacted upon by the JAAP and either alone or cumulatively with other plans and projects were highlighted. Subject to further more detailed assessment demonstrating the contrary, it is considered likely that impacts to these particular sites could affect a range of species and ecosystems in the absence of measures to address them. Impacts from the JAAP on these sites are most likely to arise from increased recreational pressures and possibly also from air pollution arising as a result of cumulative increases in traffic. Sites most likely to be impacted upon by the JAAP are those that are either situated immediately adjacent to the regeneration area such as Shoreham Beach SNCI/LNR and Adur Estuary SSSI or are located close to transport links such as Mill Hill SNCI/LNR and Beeding Hill to Newtimber Hill SSSI. Other sites that are considered to be particularly vulnerable within the study area include the SNCIs situated in the north-east of the study area alongside the A27 (including Waterhall SNCI). These could be affected by increased traffic-related air pollution and recreational pressure, due to their proximity and easy access from urban areas to the south.

Local Planning Documents

3.25 Table 3 below provides a summary of key policies from local planning documents that are relevant to this study.

Table 3: Summary of Relevant Policy From Local Planning Documents

Planning document name and policy

Brighton and Hove Local Plan (Brighton and Hove City Council, 2005)
The following saved policies will be retained until replaced by the City Plan Part Two which is due for adoption in 2018. Policy QD2, QD17 and SU4 are relevant but have been replaced by Policy CP8, 10, 11 and 12 of BHCC City Plan Part One (see below).
 	
Policy NC4 Sites of Nature Conservation Importance: relates soley to Basin Road South SNCI for this study and states:
"Planning permission will not be granted for a proposal within, or in the setting of, an existing or proposed SNCI where it is likely to have an adverse impact, on the nature conservation features of the site. Exceptions will only be made where:
• *the proposal can be subject to conditions that will prevent damaging impacts on the nature conservation features and their setting and includes provision for the protection, enhancement and management of nature conservation features; or*
• *the proposal is: essential to meet social, environmental and / or economic needs; of more than local importance within the City; cannot be located anywhere else; and the following requirements have been met:*
  ○ *the location, design and construction of the development is such that damage to nature conservation features is minimised and opportunities are taken for nature conservation gain;*
  ○ *compensating and equivalent nature conservation features are provided;*
  ○ *remaining features are protected and enhanced and provision made for their management; and*
  ○ *improvements to public appreciation of and access to the site are provided.*
Conditions will be imposed or a planning obligation sought in order to secure these requirements".
 	
Policy QD15 Landscape Design: states that all proposals for development must submit details to show that,,, "*where appropriate, existing nature conservation features have been retained and new suitable ones created*".
 	
Policy QD16 Trees and Hedgerows: states that new development should,,, "*identify existing trees, shrubs and hedgerows, seek to retain existing trees and hedgerows and wherever feasible include new tree and hedge planting in the proposals with native species used, where appropriate*".
 	
Policy QD18 Species Protection: states that "*Where it is evident that a proposal could directly or indirectly affect a species of animal or plant, or its habitat (including feeding, resting and breeding areas) protected under National legislation, European legislation or categorised as 'a declining breeder', 'endangered', 'extinct', 'rare' or 'vulnerable' in the British 'Red Data' books, the applicant will be required to undertake an appropriate site investigation. Measures will be required to avoid any harmful impact of a proposed development on such species and their habitats. Where practicable, the developer will be expected to enhance the habitat of the respective species. Where necessary, a condition will be imposed or a planning obligation sought in order to secure these requirements. Permission will not be granted for any development, including changes of use, that would be liable to cause demonstrable harm to such species and their habitats.*

Brighton & Hove Submission City Plan Part One (Brighton and Hove City Council, 2013)
Policies relevant to this study include the following:
SA1 The Seafront: Priorities for the Western Seafront include,,,"*Opportunities for tree planting and coastal habitat creation north and west of the Lagoon should be explored to soften the appearance of the A259, improve microclimate and provide shade and enhance biodiversity*".
 	
DA8 Shoreham Harbour: At South Quayside / Port Operational,,,, "*To improve Wharf Road and Basin Road South as a popular recreational route for walking and cycling providing access to the beaches*". At Portslade and Southwick Beaches,,, "*Improvements to the quality, access, appearance and maintenance of the Public Right of Way corridor, beach promenade, public areas and beach environment*".
 	
CP8 Sustainable Buildings: The council will require all development to incorporate sustainable design features unless it can be demonstrated that doing so is not technically feasible and/or would make the scheme unviable. This includes amongst others, reducing the 'heat island effect' [by the greening of buildings via for instance green roofs, green walls and tree planting] and surface water run-off and enhancing biodiversity.
 	
CP10 Biodiversity:
"The council will develop programmes and strategies which aim to conserve, restore and enhance biodiversity and promote improved access to it through the following:
• *Working with neighbouring local authorities, contribute to the delivery of biodiversity improvements within the South Downs Way Ahead Nature Improvement Area, which incorporates parts of the urban area, the urban fringe, the seafront and surrounding downland* [includes Vale Park and Portslade Beach]. *Within the NIA, a strategic approach to nature conservation enhancement will be taken, with the objectives of:*
  ○ *linking and repairing habitats and nature conservation sites to achieve landscape scale improvements to biodiversity;*
  ○ *conserving, restoring, recreating and managing priority habitats and protecting and recovering priority species populations to contribute to Local Biodiversity Action Plan targets;*
  ○ *enabling people to have improved access to and understanding of local habitats and species; and*
  ○ *ensuring development delivers measurable biodiversity improvements.*
• *Ensure that all development proposals:*
  ○ *Provide adequate up-to-date information about the biodiversity which may be affected;*
  ○ *Conserve existing biodiversity, protecting it from the negative indirect effects of development, including noise and light pollution;*
  ○ *Provide net gains for biodiversity wherever possible, taking account of the wider ecological context of the development and of local Biosphere objectives; and*
  ○ *Contribute positively to ecosystem services, by minimising any negative impacts and seeking to improve the delivery of ecosystem services by a development.*
• *Establish criteria-based policies against which development proposals affecting designated sites of international, national and local importance; protected species; and biodiversity in the wider environment will be judged. Such policies will distinguish between the relative importance of each of these nature conservation features to provide clarity about when development may be permitted and about any mitigation, conservation and enhancement which may be required.*

Table 3: Summary of Relevant Policy From Local Planning Documents

Planning document name and policy
• *Monitor progress with the delivery of biodiversity objectives through suitably devised indicators".* CP11 Managing Flood Risk: states that,,, "*development should include appropriate sustainable drainage systems in order to avoid any increase in flood risk and to ideally reduce flood risk. Where flood risk management or mitigation measures are required, the opportunity to simultaneously achieve wider sustainability and biodiversity objectives for the city (as identified in CP8 and CP10) should be investigated and will be encouraged*". It supports this by saying "*green roofs can offer multiple benefits of helping to reduce surface water runoff, making buildings more sustainable, and enhancing biodiversity and the green network. Sustainable Drainage Systems (SUDS) can offer a similar range of sustainability benefits in addition to managing surface water. Solutions that offer multiple sustainability benefits will be encouraged".* CP13 Public Streets and Spaces: aims to improve the public urban realm though new development schemes, transport schemes and regeneration schemes by ,,,, "*incorporating street trees and biodiversity wherever possible".* CP16 Open Space: states that for new development and open space,,, "*lighting proposals, including floodlighting, will be required to minimise light pollution, help reduce crime and not cause significant harm*".
Brighton and Hove Supplementary Planning Document (SPD) 11: Nature Conservation and Development (Brighton and Hove City Council, 2010) This SPD is of material consideration in determining planning applications. It forms a part of the Local Development Framework (LDF) and is intended to elaborate upon policies in the Development Plan Documents (DPD). Annexe 7 provides guidance on the selection of native plants of local provenance and non-native plants of recognised wildlife value, planting of woodland/hedgerow/scrub, flower-rich grassland, aquatic plants, coastal vegetated shingle, green roofs and green walls. These guidelines support those given in the *Shoreham Harbour Streetscape Guidance* (see below) and should be consulted for the creation of habitats at SS1 and SS2 and other landscape work within BHCC's authority boundary at the western end of Shoreham Harbour.
The Brighton & Hove Local Biodiversity Action Plan (Brighton and Hove City Council, 2012) This LBAP addresses the species and the habitats of particular importance in Brighton and Hove. These have been identified after considering the nationally important species and habitats which occur in the City, together with additional recommendations made by local naturalists. Species and habitats, that are potentially relevant to the site include species such as bats, short-snouted seahorse, the coastal plant sea heath *Frankenia laevis* and the birds herring gull, starling, swift, swallow and house martin. Habitats include parks and gardens, hedgerows and vegetated shingle. Vegetated shingle is of particular relevance as it is the criteria for designation of Basin Road South SNCI. Conservation objectives for the vegetated shingle habitat action plan include: • *Maintain the total extent of coastal vegetated shingle habitat in Brighton and Hove with no net loss.* • *By 2015, establish programmes to achieve favourable or recovering condition of any existing coastal vegetated shingle which is currently in unfavourable condition.* • *Increase the area of vegetated shingle in Brighton and Hove to 1.3 ha by 2020 through new development or habitat creation schemes (this target is based on local aspirations and opportunities and not on the national or Sussex-based targets).*
Shoreham Harbour Streetscape Guidance (BDP, 2012) The Public Realm Arrangement states that street trees should be planted in grass or shrub beds wherever possible. The guide sheets for all Harbour/Inland Characters Areas state that for vegetation, "*All species are to be salt tolerant and suitable for a coastal environment. "Native species to be used where possible. Trees to be securely staked, hardy and able to withstand strong winds*". A list of suitable tree, shrub and ground cover planting is provided in Section 8.13. This guidance supports that given in *BHCC's SPD 11: Nature Conservation and Development* which is summarised above.
Western Harbour Arm Development Brief: Sustainability Appraisal and Strategic Environmental Assessment Addendum Report (Shoreham Harbour Regeneration, 2013a) Western Harbour Arm Development Brief Area relates to strategic site 4. Nine Strategic Objectives for the regeneration project have been developed by combining relevant objectives from both the emerging *Adur Local Plan* and the emerging *Brighton & Hove City Plan*. The SA Panel made the following recommendations in regards to four objectives relevant to this study: Strategic Objective 2: Encourage the sustainable use of water. "*All new development will incorporate SuDS and demonstrate how surface water run-off will be minimised*". Strategic Objective 9: To reduce pollution and the risk of pollution to water. "*All new developments will demonstrate how they can reduce pollution to water directly from site activities and from storm water run-off*". Both of these objectives are addressed in principle WH4: Water, WH7: Contamination and WH19: Flood Risk Management and no further recommendations were made. Strategic Objective 4: Conserve and enhance biodiversity (flora and fauna) and habitats. "*All development will aspire to provide net gains to biodiversity. This will include appropriate planting schemes, as well as on-site features such as green roofs, green walls and the provision of bird nesting boxes and bat roosting boxes and the creation or enhancement of off-site habitats*". This is addressed in principle WH20: Ecology and Biodiversity and whilst no further recommendations were made the following commentary was provided: *"Although redevelopment of sites may present significant opportunities to enhance biodiversity and habitats, the emerging proposals did not include any measures to achieve this. The panel felt that the Western Arm offered the greatest opportunity to enhance biodiversity in the area and that this should be clearly addressed in the development brief. Flood risk mitigation works could enable significant enhancements. This might include incorporating additional intertidal habitats. The riverbank in this area is south facing and has a relatively sunny aspect. It is therefore suitable for a range of nectar rich and berry-bearing plants, although the coastal location does create difficult growing conditions. Planting schemes in this area and any public space in the Western Arm should maximise the use of these plants. There is relatively little biodiversity to conserve or enhance in the Western Harbour Arm itself, and the area is largely devoid of significant wildlife habitats. However it is adjacent to the Adur Estuary SSSI and close to intertidal mudflats which are important habitats for a range of bird species. The area also includes Kingston Beach village green. There are also a number of vacant sites which provide scrubland. These can be suitable habitats for birds and other wildlife. Provided that the requirement to provide net gains to biodiversity is adopted and enforced, there are likely to be positive impacts in relation to biodiversity and habitats. However, an increased population in the area could also have negative impacts. This might include disturbance to species and habitats as a result of increased recreational pressure on natural green spaces in the area. As such there are likely to be mixed effects overall. Both positive and negative effects are likely to be incremental and to become more pronounced over time".* Strategic Objective 6: Protect and enhance public open space / green infrastructure and accessibility to it. "*All new development will be required to contribute to the provision of and improve the quality, quantity, variety and accessibility of public open space to meet the needs it generates in accordance with the criteria and local standards set out in Draft Policy 29 of the Draft Adur Local Plan*". This is addressed in principle WH23: Public open space and whilst no further recommendations were made the following commentary was provided:

Table 3: Summary of Relevant Policy From Local Planning Documents

Planning document name and policy
"The proposals in the Draft Development Brief will not involve the loss of any open space or areas of green infrastructure. Redevelopment of sites presents the opportunity to improve the provision of open space and green infrastructure and enhance existing assets. In particular, measures that improve access to the waterfront and Kingston Beach will enable greater accessibility to open space and green infrastructure. The brief also proposes three new open spaces within the Western Harbour Arm. There are therefore likely to be positive impacts, especially in the longer term".
South Portslade Industrial Estate and Aldrington Basin Development Brief: Sustainability Appraisal and Strategic Environmental Assessment Addendum Report (Shoreham Harbour Regeneration, 2013b) South Portslade Industrial Estate and Aldrington Basin Area relates to strategic site 1 and 2. Nine Strategic Objectives for the regeneration project have been developed by combining relevant objectives from both the emerging *Adur Local Plan* and the emerging *Brighton & Hove City Plan*. The SA Panel made the following recommendations in regards to four objectives relevant to this study: Strategic Objective 2: Encourage the sustainable use of water. "*All new development will incorporate SuDS and demonstrate how surface water run-off will be minimised*". Strategic Objective 9: To reduce pollution and the risk of pollution to water. "*All new developments will demonstrate how they can reduce pollution to water directly from site activities and from storm water run-off*". Both of these objectives are addressed in principle SPAB4: Water, SPAB7: Contamination and SPAB23: Flood risk and coastal processes. The following commentary was '*The risk of water pollution can be reduced through more sustainable usage of water, including the introduction of SuDS and water capture and recycling. Provision of open space, appropriate planting, green roofs and green walls can reduce the level of surface water run-off and the consequent risk of pollution'*. Strategic Objective 4: Conserve and enhance biodiversity (flora and fauna) and habitats. "*All development will aspire to provide net gains to biodiversity. This will include appropriate planting schemes, as well as on-site features such as green roofs, green walls and the provision of bird nesting boxes and bat roosting boxes and the creation or enhancement of off-site habitats*". This is addressed in principle SPAB24: Ecology and Biodiversity and further recommendations included, '*opportunities to support exemplar schemes should be sought and promoted through the JAAP and associated future initiatives'.* The following commentary was also provided: *'Although redevelopment of sites may present significant opportunities to enhance biodiversity and habitats, the emerging proposals did not include any measures to achieve this. Aldrington Basin is adjacent to the Basin Road South SNCI. The panel noted that the vegetated shingle in this area, and the habitats and species which it supports might be sensitive to development in the area, including increased recreational pressure on Portslade Beach. Although redevelopment of sites may present significant opportunities to enhance biodiversity and habitats, the emerging proposals did not include any measures to achieve this. Without a development brief existing conditions are likely to persist. Existing requirements will apply until the adoption of the City Plan. These include SPD11 (Nature conservation and development) and Local Plan policy QD17 (Protection and integration of nature conservation features). These require development schemes to integrate nature conservation features, including the creation of new habitats. Policy CP10 (Biodiversity) in the Draft City Plan states that development should provide net gains for biodiversity where possible. Provided that the requirement to provide net gains to biodiversity is adopted and enforced, there are likely to be positive impacts in relation to biodiversity and habitats. However, an increased population in the area could also have negative impacts. This might include disturbance to species and habitats as a result of increased recreational pressure on natural green spaces in the area. As such there are likely to be mixed effects overall. Both positive and negative effects are likely to be incremental and to become more pronounced over time. Recreational disturbance has been addressed in the finalised development brief.* Strategic Objective 6: Protect and enhance public open space / green infrastructure and accessibility to it. "*All new development will be required to contribute to the provision of and improve the quality, quantity, variety and accessibility of public open space to meet the needs it generates in accordance with the criteria and local standards set out in Policies CP16 and CP17 of the Brighton & Hove Submission City Plan (Part One)*". This is addressed in principle SPAB26: Public Open Space and further recommendations included, *'Further detailed investigation should be undertaken as part of the delivery plan for the JAAP to identify specific public realm improvement projects'*. The following commentary was also provided: *'Redevelopment of sites would present the opportunity to further improve the provision of open space and green infrastructure and enhance existing assets. In particular, measures that encourage improved access between West Hove promenade, the harbour waterfront and Portslade Beach will enable greater accessibility to open space and green infrastructure. Redevelopment of sites in South Portslade Industrial Estate will present the opportunity for improved provision of public open space. Increasing the permeability of the area may enable greater accessibility to open space and green infrastructure. Aldrington Basin is adjacent to the open spaces of Hove Lagoon and the West Hove and Portslade Beaches. The harbour itself is also an important open space in the area. South Portslade Industrial Estate is relatively densely developed and does not have any significant public open space or green infrastructure assets. However the area is very close to Vale Park which has been identified as a green buffer with potential for incidental improvement. The harbour itself and the nearby public beaches are also important open spaces in the area. The proposals in the development brief will prevent the loss of existing open spaces or areas of green infrastructure. Redevelopment of sites presents the opportunity to improve the provision and enhance existing assets. In particular, measures that improve access to the waterfront and beaches will enable greater accessibility to open space and green infrastructure. There are therefore likely to be positive impacts, especially in the longer term'.*
Shoreham Harbour Western Harbour Arm Development Brief (Shoreham Harbour Regeneration/Allies and Morrison Urban Practitioners, 2013b). Western Harbour Arm Development Brief Area relates to Strategic Development Site 4. Relevant overarching harbour-wide objectives (Strategic Objectives) and guiding principles which apply these objectives to new development proposals, include: SO1 Sustainable Development: To promote sustainable development. WH1 Sustainability Statements: states that "*The Shoreham Harbour Interim Planning Guidance (IPG) (2011) requires a completed Sustainability Statement as supporting information to any proposed development within the parts of the Shoreham Harbour Regeneration area* [which includes 'Biodiversity' and 'Greening' topics]*. Guidance on the format, topics and content of the Sustainability Statement is available in a separate Shoreham Harbour Sustainability Statements Guidance Note (Shoreham Harbour Regeneration 2013b)".* Policy WH4 Water: states the same as SPAB4: Water summarised above: SO 6 Flood Risk and Coastal Processes: To reduce the risk of flooding and adapt to climate change. WH19 Flood Risk Management: states the same as SPAB23: Flood Risk and Coastal Process summarised above. SO7 Local Environment: To Conserve and Enhance the Harbour's Environmental Assets. WH20 Ecology and Biodiversity: states the same as SPAB24: Ecology and Biodiversity summarised above, excluding reference to a B&HCC Biodiversity Checklist.

Table 3: Summary of Relevant Policy From Local Planning Documents

Planning document name and policy
SO 9 Place Making and Design Quality: To promote high design quality and improve townscape. WH26 Public Realm: states that the same as SPAB30 Public Realm summarised above.
South Portslade Industrial Estate and Aldrington Basin Development Brief (Shoreham Harbour Regeneration/Allies and Morrison Urban Practitioners, 2013a). Aldrington Basin Development Brief Area relates to strategic site 1 and South Portslade Industrial Estate Development Brief relates to strategic site 2. Relevant overarching harbour-wide objectives (Strategic Objectives) and guiding principles which apply these objectives to new development proposals, include: SO1 Sustainable Development: To promote sustainable development. SPAB1 Sustainability Checklist: states that "*A completed Sustainability Checklist is a validation requirement for all planning applications in Brighton & Hove*" which includes 'Biodiversity' and 'Greening' topic areas. SPAB4 Water: states that all new development will *"be expected to incorporate appropriate Sustainable Drainage Systems (SuDS) and demonstrate how surface water run-off will be minimised*",,, "*seek to provide ecological enhancements through the use of SuDS, including wetland habitat features, which help store and clean surface water, whilst also delivering biodiversity benefits and providing amenity and landscape features*",,, "*ensure compliance with the WFD [Water Framework Directive], demonstrating no further ecological deterioration in associated water bodies and incorporate opportunities to deliver further WFD objectives*",,,"*Pollution prevention techniques are incorporated to ensure only clean surface water is discharged into the River Adur*". SO 6 Flood Risk and Coastal Processes: To reduce the risk of flooding and adapt to climate change. SPAB23 Flood Risk and Coastal Process: states that "*Proposals should demonstrate how the risks of surface water run-off and water pollution have been reduced including through the introduction of Sustainable Urban Drainage Systems (SuDS) and water capture / recycling technology as part of new developments*" and that "*New developments must incorporate open space, appropriate planting, green roofs and / or green walls (suitable for coastal growing conditions) to reduce levels of surface water run-off and consequent risk of flooding*". SO7 Local Environment: To Conserve and Enhance the Harbour's Environmental Assets. SPAB24 Ecology and Biodiversity: states that: • *"In accordance with Submission City Plan Policy CP10 (Biodiversity), a completed Biodiversity Checklist will be required to accompany all development proposals. This will indicate whether a full Biodiversity Report is required.* • *All development will be required to provide a net gain to biodiversity, in particular to Biodiversity Action Plan (BAP) species and habitats. The indirect impacts of development, such as recreational disturbance, on designated nature conservation sites and other significant habitats must be considered. Appropriate mitigation must be identified, along with the means for its delivery and maintenance.* • *Development proposals will be required to include schemes to conserve, protect and enhance existing biodiversity, taking into account appropriate, coastal protected sites and species. Measures to enhance* • *biodiversity include, but are not limited to:* ○ *Incorporating appropriate planting schemes for the location, including trees and using locally native species wherever possible;* ○ *Incorporating features such as green walls and green/brown roofs, with appropriate planting for the location.* ○ *Providing bird-nesting boxes;* ○ *Providing ponds in appropriate locations;* ○ *Providing areas of vegetated shingle;* ○ *Using SuDS to create wetland habitat features, which help store and clean surface water; and* ○ *Creating, restoring or enhancing off-site habitats, including designated nature conservation sites.* SO 9 Place Making and Design Quality: To promote high design quality and improve townscape. SPAB30 Public Realm: states that "*Lighting incorporated into developments should provide the minimum required for public safety, be energy efficient, designed to illuminate the target only and avoid light pollution*".
Proposed Submission Adur Local Plan (Adur District Council, 2014) Policy 8 Shoreham Harbour Regeneration area: "*All development will be required to protect and enhance the areas important environmental assets and wildlife habitats and in particular minimise impact on the River Adur SSSI. As part of new development, north-south links will be improved to enhance access to greenspace in the rest of Adur including the South Downs National Park*". Policy 15 Quality of the Built Environment and Public Realm: Development should,,, "*Respect the existing natural features of the site, including land form, trees and biodiversity and contribute positively to biodiversity". "Lighting incorporated into developments should provide the minimum for public safety, be energy efficient, designed to illuminate the target only and avoid light pollution".* Policy 31 Green Infrastructure: recognises that open space provision contributes to the overall Green Infrastructure network. • *"Green infrastructure will be protected and enhanced and access to it improved where necessary and appropriate. When considering green infrastructure provision, the ecological characteristics of the area will be taken into account in order to maximise the biodiversity benefits.* • *Developments will be required to incorporate elements of green infrastructure into their overall design, and/or enhance the quality of existing Green Infrastructure as appropriate.* • *The Council will work with relevant partners and developers to facilitate the creation of an integrated network of green infrastructure within and beyond Adur. A Green Infrastructure Strategy will be produced and developments will be expected to comply with this document.* • *The planting of trees will be supported and encouraged and Tree Preservation Orders will be made to ensure that healthy locally important trees that make a positive contribution to the streetscene are protected. A Green Infrastructure Supplementary Planning Document will be produced by the Council".* Policy 31 Biodiversity: states that "*All development should ensure the protection, conservation, and where possible, enhancement of biodiversity and if significant harm cannot be avoided (by locating on an alternative site with less harmful impacts), adequately mitigated, or compensated for, then planning permission should be refused. Proposed developments which would adversely affect a SSSI (individually or cumulatively) will not normally be permitted.*

Table 3: Summary of Relevant Policy From Local Planning Documents

Planning document name and policy
Exceptions will only be made where the benefits of the development on the particular site clearly outweigh both the impacts that it is likely to have on the features of the site that make it of special scientific interest and any broader impacts. Proposals for development in, or likely to have an adverse effect (directly or indirectly) on a LNR or SNCI will not be permitted unless it can be demonstrated that reasons for the proposal outweigh the need to safeguard the nature conservation value of the site/feature. Where appropriate, the Authority will use planning conditions or obligations to provide appropriate enhancement and site management measures, and where impacts are unavoidable, mitigation or compensatory measures. Where relevant, new development adjacent to the Adur Estuary or the coast will have to demonstrate how it is addressing the issue of coastal squeeze". Policy 37 Flood Risk and Sustainable Drainage: states that "*New development within Adur must include some form of Sustainable Drainage System (SuDS) or other appropriate design measures in order to reduce the risks of surface water flooding and to mitigate the risk of pollution to groundwater sources. SuDS should be considered before other forms of disposal,,,, SuDS must be designed sensitively and must seek to enhance landscapes, increase biodiversity gains, and provide quality spaces".*
Shoreham Harbour Joint Area Action Plan – Draft for Consultation (Shoreham Harbour Regeneration, in progress) Strategic Objectives, Character Area policies and Harbour-wide policies relevant to this study include the following: SO7 Nature Conservation: To conserve and enhance the harbour's environmental assets. "*To protect and enhance the area's important environmental assets and wildlife habitats including SSSI, RSPB Reserve, SNCI, LNR and Village Green*". Policy JAAP 2: South Quayside. *"Improvements will be sought to the Basin Road South cycle route (No.2) and Monarch's Way Public Right of Way including signage, interpretation, boundaries, surfacing, way finding and access to the beaches*". Policy JAAP 7: Portslade & Southwick Beaches. *"The beach areas and adjacent public spaces will be safeguarded for the protection of coastal processes, marine habitats and the enjoyment of local communities and visitors. The Partnership will promote opportunities to improve the quality of public access areas connected to the beaches including remediation and interpreting the SNCI and safeguarding to protect from future disturbance*". Such improvements should consider ground nesting birds such as ringed plover which are known to use this part of the beach. Policy JAAP 9: Fishersgate. "*The Partnership will support Action Eastbrook Partnership and local service providers to deliver improvements and harness benefits arising for harbour-side communities*". Emerging priorities include enhancing Fishersgate Recreation Ground (Enhancement Site 10 in Appendix 2 of this report) amongst others. Policy JAAP 11: Harbour Mouth. "*Ensure that the Shoreham Beach Local Nature Reserve is protected. In particular the most sensitive sections of the beach in terms of ground nesting birds and vegetated shingle*". Policy JAAP 12: Western Harbour Arm (SS4). "*High quality, multi-functional public open space in order to will need to be provided where appropriate in accordance with Adur Local Plan standards and guidance". "To enhance the area's natural biodiversity by incorporating multi-functional greenspace*" is also stated as an area priority for the Western Harbour Arm. Policy JAAP 13: Western Harbour Arm (SS4) – Transport. "*New waterfront route must incorporate SUDS features, such as permeable surfacing and incorporating suitable trees and vegetation*". Policy JAAP 15: Western Harbour Arm (SS4) - Marine Environment. "*Developments should seek opportunities to incorporate ecological enhancements to the marine/estuarine environment to promote biodiversity, where possible and appropriate to do so,,, Development that results in any loss or degradation of intertidal habitat will be required to be appropriately compensated for*". Policy JAAP 17: Sustainable Design. Re-iterates SPAB1 and WH1 of the above development briefs in regards to both Adur and BHCC Sustainability Statement requirements. Policy JAAP 18: Sustainable Use of Water. "*Development proposals should ensure compliance with the Water Framework Directive (WFD), demonstrating no further ecological deterioration in associated water bodies. All schemes should also incorporate opportunities to deliver further WFD objectives. All development will be expected to incorporate appropriate Sustainable Drainage Systems (SuDS) and demonstrate how surface water run-off will be minimised. Development should seek to provide ecological enhancements through the use of SuDS*". Policy JAAP 31: Managing Flood Risk. "*Proposals should demonstrate how the risks of surface water run-off and water pollution have been reduced including through the introduction of Sustainable Drainage Systems (SuDS) and water capture / recycling technology. SuDs to also be applied to hard landscaping (including paving and road carriageways). "New developments must incorporate open space, appropriate planting, green roofs and / or green walls (suitable for coastal growing conditions) to reduce levels of surface water run-off and consequent risk of flooding*". Policy JAAP 32: Biodiversity and Nature Conservation states the same as SPAB24 and WH20: Ecology and Biodiversity summarised above, excluding reference to a BHCC Biodiversity Checklist. It does however make additional reference to bat-roosting boxes as a potential biodiversity enhancement and in regards to '*creating, restoring or enhancing off-site habitats'* it refers in particular to contributions to management and monitoring plans for, local conservation sites such as Shoreham Beach and Widewater Lagoon LNRs. Policy JAAP 34: Public Open Space and Green Infrastructure. "*Development proposals will be required to provide high quality public open space / green infrastructure on site" [which may include parks and gardens, amenity green space, provision for children and young people, outdoor sports facilities, allotments and community gardens]. Improved linkages to existing open space assets and green corridors will be encouraged*".

Table 3: Summary of Relevant Policy From Local Planning Documents

Planning document name and policy
Sustainability Appraisal and Strategic Environmental Assessment of the Shoreham Harbour Regeneration Project (Shoreham Harbour Regeneration, 2014b) Twenty-two Sustainability Appraisal (SA) Objectives have been developed to describe, analysed and compare the effects of sustainability. The key SA Objective relevant to this study is Number 4 which is to conserve, protect and enhance biodiversity (flora and fauna) and habitats. Through the multi-functionality of SuDS and green infrastructure, SA Objectives 2, 6, 11 and 18 are also relevant. In relation to SA Objective 4 the only negative score recorded for policies in the Draft JAAP was for Character Area 5 - Fishersgate & Southwick Waterfront. This is because of the opportunity for commercial and leisure uses on the North Canal Bank which is an important habitat for a number of species [*viz.* reptiles], the loss [understood to include species loss, habitat loss and fragmentation] of which would have a negative impact. The increased risk of disturbance to designated nature conservation sites has also been identified as a potential negative impact. Uncertain impacts were identified for Character Area 4: Portslade & Southwick Beaches which includes Basin Road South SNCI. It states that '*the site is currently in poor condition, and the policy does not address the remediation of the site'*. Indicators for SA Objective 4 set within the SA framework include 14-18 which include: • *Number and scale of developments commenced within designated sites and reserves or significantly affecting such sites;* • *Number of developments which deliver a net gain in biodiversity and habitats;* • *Number of developments commenced within BAP habitats;* • *Amount and net loss or gain in area of land identified as BAP habitat; and* • *State or condition of nationally or locally designated sites within or adjacent to the regeneration area.*
Shoreham Harbour Flood Risk Management Guide SPD (Shoreham Harbour Regeneration, 2015a)            The Western Harbour Arm (SS4) has the highest level of flood risk and the SPD has focused on this area, dividing it into three frontages: 1) Adur Ferry Bridge to the Riverside Business Centre 2) Riverside Business Centre to Kingston Beach 3) Kingston Beach. The wharf walls comprise numerous types, ages and standards of piling in a varying state of repair. The Preferred approaches to these frontages are shown in the insert. The alignment of the flood wall could change along the length of the harbour arm depending on specific site proposals and still be designed to integrate with existing and proposed defences. A setback distance to allow for a riverside route (pedestrian and cycle access) will be required. The public realm could be designed to allow varying levels of inundation whilst maintaining protection to development and public areas beyond. Landscaped design, such as boardwalks, stone terracing, and planting could be introduced to soften the appearance of the sheet piling. Seating and play areas could also be integrated into the flood defences to maximise their use. It is considered that where appropriate, areas of public realm could be incorporated as part of the overall SuDS strategy and utilised to safely detain urban runoff. Guiding principle FRMG5: Intertidal Compensatory Habitat: states "*Any scheme must avoid causing harm to biodiversity in the first instance. If it cannot be avoided then the impacts need to be adequately mitigated, or, as a last resort, compensated for according to the National Planning Policy Framework. Schemes should incorporate measures designed to deliver ecological enhancements. Consultation with the Environment Agency is necessary for proposals which encroach into the river environment. For such schemes, applicants should:* • *avoid negative ecological impacts* • *reduce negative impacts that cannot be avoided; and* • *compensate for any remaining significant negative ecological impacts* *Where compensatory intertidal habitat is required, applicants should:* • *calculate the area of habitat loss through undertaking up-to-date surveys;* • *compensate for habitat loss on a like for like basis, providing the same area and quality of habitat being lost;* • *Identify / deliver sites for compensation appropriate to habitats and species they are designed to support.* *For further guidance review the chartered Institute of Ecology and Environmental Management technical guidance. Management agreements should be included as part of the planning application for sites of compensatory habitat to ensure the long term integrity for wildlife benefit.* Guiding principle FRMG7: Sustainable Drainage Systems (SuDS): states "*Appropriate SuDS should be delivered at all new developments within the regeneration area. Applications should follow the approach set out in the following publications (or subsequent replacement documents): (i) Adur & Worthing Councils and/or Brighton & Hove Council's SFRAs (ii) Water. People. Places: A guide for master planning sustainable drainage into developments (iii) CIRIA SuDS Manual. Pollution control measures will be required to deal with surface water run-off where this is discharging straight into the river. This is especially relevant where riverside vehicular access is promoted".* SuDS should be designed with the goals of managing flood risk, minimising the impact that surface water drainage has on water quality and the environment, increasing biodiversity by providing new habitats and improving the public realm. These goals should be key considerations in the design of SuDS for the area. It is likely that for most sites, only site and source controls will be appropriate with the River Adur acting as the main regional control. Source control components within the curtilage of properties or highways areas should be encouraged and can include green roofs, permeable surfaces, rainwater harvesting and water butts.

Table 3: Summary of Relevant Policy From Local Planning Documents

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Shoreham Harbour Flood Risk Management Guide SPD Technical Annexe (Shoreham Harbour Regeneration, 2015b). This technical annexe includes *Shoreham Harbour Regeneration Environmental Scoping Study (2014*) which states that flood defence Options 1.1, 1.4 and 3.1 (Western Harbour Arm) would cause the permanent loss of intertidal Biodiversity Action Plan (BAP) habitats and would be likely to have the greatest long term impact on these areas due to the risk of sea level rise causing coastal squeeze. Option 2.2 will also extend the defence line seaward and has the potential to cause coastal squeeze. Such impacts would in turn have the potential to adversely affect the special interest of the Adur Estuary SSSI (Options 1.1 and 1.4) and would conflict with a wide range of legislation and strategic objectives focused on the protection and enhancement of such sites. These potential impacts are closely linked to the Water Framework Directive (WFD) objectives for the waterbody and as such, it is possible that all of the options could conflict with achieving these objectives. The environmental impacts of any flood defence scheme would need to be assessed further during the development of the preferred concept option so as to inform its detailed design and the requirement for appropriate mitigation measures. A number of surveys and assessments would be required to gain a more detailed understanding of the environmental baseline and the potential environmental issues associated with the scheme. These surveys would need to be agreed in advance through consultation with Adur District Council and other relevant stakeholders, including the EA, NE and English Heritage. The preferred concept option would require formal screening by Adur District Council under the Town and Country Planning (Environmental Impact Assessment) Regulations 2011 to determine the requirement for a statutory EIA.

HABITAT SURVEY

Aldrington Basin: Strategic Site 1

3.26 SS1 is 4.98ha in size and located at the eastern end of the regeneration area adjacent to Hove Lagoon (see photograph below). It forms the eastern gateway to the harbour accessible from Wharf Road and is delimited by Kingsway (A259) to the north, Basin Road South to the east and south and Aldrington Basin to the west. Basin Road South SNCI is adjacent to its south-west boundary.

3.27 Buildings (office and retail) and hardstanding dominate SS1. Other habitat types include scattered trees and scrub, one non-native hedgerow (bordering Hove Lagoon), introduced shrubs, species-poor semi-improved grassland, scattered saltmarsh/vegetated shingle plants, tall-ruderal vegetation, ephemeral/short perennial vegetation (as self-established weeds etc.) and bareground.

View south-west across eastern end of SS1. Non-native hedgerow around edge of Hove Lagoon supports a good population of nesting house sparrow © TEC.

3.28 The largest area of vegetation is the grass embankment below the Kingsway – which corresponds to Enhancement Site 2 in Appendix 2. It is dominated by common couch *Elytrigia repens*.

3.29 Scattered saltmarsh/vegetated shingle plants present along Basin Road South (South Basin Quay) include sea couch *Elytrigia atherica*, buck's-horn plantain *Plantago coronopus*, silver ragwort *Senecio cineraria and* rock samphire *Crithmum maritimum*.

3.30 Introduced shrub, scattered tree and scrub species comprise silver ragwort, tamarisk *Tamarix gallica,* bramble *Rubus fruticosus* agg., evergreen spindle *Euonymus japonicus*, cypresses *Cupressus* spp., pines *Pinus* spp. and Japanese pittosporum *Pittosporum tobira.*

South Portslade: Strategic Site 2

3.31 SS2 is 7.58ha in size and located at the eastern end of the regeneration area to the north of Wellington Road (A259), west of Station Road/Boundary Road and east of Brambledean Road. It is dominated by buildings (i.e. a mix of industrial premises situated within a wider residential neighbourhood) and hardstanding.

View south-west from A259 with terraced embankment above Travis Perkins. Vacant land at Brittania Wharf in background which potentially qualifies as 'Open Mosaic Habitat On Previously Developed Land' © TEC.

3.32 Vegetation is generally absent due to the dense urban nature of the site, apart from the frontage to Wellington Road at the eastern end of the site – see Enhancement Sites 4 and 5 in Appendix 2. These two areas are dominated by species-poor semi-improved grassland.

3.33 Other habitat types present include scattered trees (in back gardens), dense and scattered scrub, non-native hedgerows (fronting houses on Station Road), introduced shrubs, species-poor semi-improved grassland, amenity grassland, tall-ruderal vegetation, ephemeral/short perennial vegetation (as self-established weeds etc.) and bareground.

3.34 Species-poor semi-improved grassland fronting Station Road comprised dominant Yorkshire fog *Holcus lanatus*, abundant common couch, frequent ribwort plantain *Plantago lanceolata* and occasional red fescue *Festuca rubra*, oxeye daisy *Leucanthemum vulagre*, ragwort *Senecio jacobaea* and creeping cinquefoil *Potentilla reptans*.

3.35 Amenity grassland fronting Station Road comprised abundant perennial ryegrass *Lolium perenne* and white clover *Trifolium repens*, frequent cock's-foot *Dactylis glomerata* and occasional ribwort plantain, daisy *Bellis perennis* and dandelion *Taraxacum* agg.

3.36 Scrub and introduced shrub comprised locally abundant Elaeagnus *Elaeagnus* sp., frequent bramble and occasional daisy bush *Olearia x haastii,* elder *Sambucus nigra* and traveller's joy *Clematis vitalba*.

Southwick Waterfront: Strategic Site 3

3.37 SS3 is 1.24ha in size and located in the centre of the regeneration area fronting Southwick Canal and Prince George Lock. Albion Street forms the northern boundary, Riverside the eastern boundary, Southwick Canal the southern boundary and Nautilus House (Shoreham Port Authority) the western boundary.

3.38 Buildings and hardstanding for car parking dominate SS3. Other habitat types include scattered scrub, species-poor semi-improved grassland, tall ruderal vegetation, ephemeral/short perennial vegetation (as self-established weeds etc.), two areas of brackish open water (with associated jetties and pontoons), bareground and a small area of mud bank.

3.39 The bank fronting the water at Riverside comprised species-poor semi-improved grassland dominated by common couch with frequent common nettle *Urtica dioica* and occassional Alexanders *Smymium olusatrum* and tamarisk shrubs. Parts of the bank were not protected and showed signs of slumping.

3.40 Vacant land at Lady Bee Marina was dominated by a raised area of bareground and concrete blockwork revetment (see Photograph to right) to the east that was becoming vegeated with self-established tall ruderal and ephemeral/short perennial vegetation. This is the development of the early stages of 'Open Mosaic Habitat On Previously Developed Land' – a priority habitat.

Concrete blockwork revetment around eastern edge of vacant land at Lady Bee Marina. Forms part of SS3 © TEC.

3.41 Bristly oxtongue Helminthotheca echioides and hard fern-grass *Catapodium rigidum* was abundant with frequent common couch, cock's-foot, white clover, black medick

Medicago lupulina, common field speedwell *Veronica persica* and occasional butterfly bush *Buddleja davidii*, purple toadflax *Linaria purpurea*, cleavers *Galium aparine* and red dead-nettle *Lamium purpureum*. Wall cotoneaster *Cotoneaster horizontalis* was also present and is listed as an invasive species on Schedule 9 of the Wildlife and Countryside Act 1981 (as amended).

Western Harbour Arm: Strategic Site 4

3.42 SS4 is 14.50ha in size and located in the western half of the regeneration area along the northern edge of the River Adur. It stretches west from the harbour mouth to Adur Ferry Bridge with its northern boundary delimited by Brighton Road (A259). It is dominated by industrial land with both working and vacant wharfes along its length. Sussex Yacht Club is present at its western end where the southern boundary (marked by Mean Lower Water Mark) includes both the jetties/pontoons of the Club and intertidal mudflats (see Photograph to right). Between Free Wharf and Kingston Wharf the southern boundary comprises continuous metal sheet piling with some wooden baulking attached at the east end. A small beach is present at the eastern end of SS4.

Intertidal mudflats south of Riverside Business Centre along the Western Harbour Arm. Adjacent to SS4 © TEC.

3.43 The site is dominated by buildings and hardstanding. Other habitats present include scattered trees (around the boundaries of the former Parcelforce site), scattered scrub, introduced shrubs, species-poor semi-improved grassland, amenity grassland, tall ruderal vegetation, ephemeral/short perennial vegetation, bareground, spoil piles, shingle, rocks/boulders, brackish running water (the River Adur), intertidal mudflats and continuous and scattered saltmarsh.

3.44 The small beach comprised a mixture of sand, shingle, artificial substrates and rock armour revetment (see photograph to right). Scattered shingle plants were present along the fence marking the eastern boundary of the beach/SS4 and included common couch, rock samphire, Danish scurvy grass *Cochlearia danica* and sea beet *Beta vulgaris* ssp. *maritima.*

Shingle, mixed artificial substrates and rock armour revetment at the beach adjacent to RNLI Shoreham Lifeboat Station. Forms the eastern end of SS4 © TEC.

3.45 Brown seaweeds *Fucus* spp. and green filamentous seaweeds covered rocks and boulders within the intertidal zone and common mussel *Mytilus edulis*, common cockle *Cerastoderma edule* and common limpet *Patella vulgata* were present on timber baulking attached to metal sheet piling.

3.46 Vacant land at Lennards Wharf has become vegetated with a mosaic of scrub, species-poor semi-improved grassland, tall ruderal vegetation and ephemeral/short perenial vegetation. A variety of vegetated spoil piles and waste material were also present (see Photograph to right). Scrub species included locally abundant butterfly bush and frequent to occasional bramble, traveller's joy and grey willow *Salix cinerea*.

Vacant land at Lennards Wharf which qualifies as 'Open Mosaic Habitat On Previously Developed Land' – a habitat of principal importance © TEC.

3.47 Grasses and wildflowers included dominant common couch, abundant to frequent bristly oxtongue, ribwort plantain, black medick, common mouse-ear *Cerastium*

fontanum and wild carrot *Daucus carota*. Common centaury *Centaurium erythraea,* kidney vetch *Anthyllis vulneraria,* poppy *Papaver* sp. and colt's-foot *Tussilago farfara* were locally frequent. This site potentially qualifies as 'Open Mosaic Habitat On Previously Developed Land' – a habitat of principal importance.

3.48 A narrow band of continuous saltmarsh vegetation was present along the concrete blockwork revetment around the east, south and west edges of the main yard at Sussex Yacht Club (see photograph to right). It comprised abundant sea purslane *Halimione portulacoides*, occassional sea beet, sea couch, buck's-horn plantain and sea plantain *Plantago maritima* and rare rock samphire and sea aster *Aster tripolium*. On the bare mudflats fringing the concrete block revetment, monotypic patches of sea aster were locally frequent.

Continuous saltmarsh vegetation around eastern edge of Sussex Yacht Club (foreground). Scattered saltmarsh plants at entrance to Hard (background). Both areas form part of SS4 © TEC.

3.49 Continuous saltmarsh vegetation has affinities with **SM14 *Halimione portulacoides* salt-marsh community,** although the typically constant common saltmarsh-grass *Puccinelia maritima* was absent (Rodwell, 2000). This is a species-poor saltmarsh community which is widespread and extensive in the south-east. It exhibits a variable position in the saltmarsh zonation (i.e. low-mid-upper zones) and at SS4 is likely to represent the middle to upper zone formed artificially on the concrete block revetment, above the Mean High Water Mark. The patches of sea aster show an affinity with **SM11 *Aster tripolium* var. *discoideus* salt-marsh community** which typically occurs in the south-east as part of the low saltmarsh zone. It can, however, pass upwards into the mid-zone and can be frequently found at the lower edge of SM14 (Rodwell, 2000).

PROTECTED SPECIES ASSESSMENT

3.50 This information is summarised in Table 5 below. As dicussed in Section 2 of this report great crested newt, dormice, water vole and white-clawed crayfish have been scoped out of this assessment.

BAT ASSESSMENT

3.51 A total of 163 built structures were assessed in terms of their potential for roosting bats, as part of the assessment. Due to the urban industrial location of the majority of the buildings/structures and the lack of suitable bat foraging habitats within close proximity to the buildings/structures, the following assessment criteria were assigned to the built structures within the four strategic sites:

- 1 x built structure was assessed as having high potential to support roosting bats
- 20 x built structures were assessed as having moderate potential to support roosting bats;
- 99 x built structures were assessed as having low potential to support roosting bats;
- 26 x built structures were assessed as having negligible potential to support roosting bats; and
- 17 x built structures could not be assessed at the time of the survey.

ASSESSMENT OF GREEN INFRASTRUCTURE OPPORTUNITIES

3.52 Recording sheets and maps for each of the 15 sites assessed are presented in Appendix 2. A summary of the number of opportunities for enhancement at each of these sites is provided (expressed as Low/Med/High) in Table 4 below.

Table 4: Summary of GI Assessment

Site Number / Name	Location	Size (ha)	Enhancement Options
1 - Wharf Road Embankment	Wider regeneration area adj. to SS1	0.16	Low
2 - Basin Road North Embankment (East)	SS1	0.09	Low
3 - Basin Road North Embankment (Central)	Wider regeneration area adj. to SS1	0.21	Medium
4 - Frontage to Wellington Road (East)	SS2	0.04	Medium
5 - Frontage to Wellington Road (West)	SS2	0.16	Medium
6 - Basin Road North Embankment (West)	Wider regeneration area adj. to SS2	0.12	Low
7 - Vale Park	Outside regeneration area	2.43	High
8 - Basin Road North Embankment (Cemex)	Wider regeneration area adj. to SS2	0.31	Low
9 - Frontage to Fishersgate Terrace/West Rd.	Wider regeneration area	0.84	High
10 - Fishersgate Recreation Ground	Wider regeneration area	1.12	High
11 - North Canal Bank below A259	Wider regeneration area	2.35	Medium
12 - Frontage to Rock Close	Wider regeneration area adj. to SS3	0.30	High
13 - Frontage to Coats Court	Wider regeneration area adj. to SS3	0.36	Low
14 - Kingston Beach	Wider regeneration area adj. to SS4	3.45	Medium
15 - The Ham	Wider regeneration area adj. to SS4	4.35	Medium
	Total Area	16.29	

Table 5: Summary of Baseline Ecology Information for Strategic Sites

Feature			Strategic Site			
			Aldrington Basin	South Portslade	Southwick Waterfront	Western Harbour Arm
Protected Species Assessment	Breeding birds (WCA)		HIGH	HIGH	HIGH	HIGH
	Widespread reptiles (WCA)		NEG	NEG (LOW frontage to A259 and gardens only)	NEG (LOW at vacant land, Lady Bee Marina only)	NEG (MED at Lennards Wharf only)
	Roosting bats (WCA/HabRegs) in buildings*		NOT KNOWN(0) NEG(2) **LOW(4)** MED(0) HIGH(0)	NOT KNOWN(6) NEG(9) LOW(62) **MED(5)** HIGH(0)	NOT KNOWN(2) NEG(0) **LOW(4)** MED(0) HIGH(0)	NOT KNOWN(7) NEG(5) LOW(22) MED(3) **HIGH(1)**
	Badgers (PBA)		NEG	LOW (frontage to A259 and gardens only)	NEG	NEG
	Invertebrates (WCA)	Terrestrial	LOW	LOW	LOW	LOW (MED - Open Mosaic Habitat, Lennards Wharf)
		Aquatic	NEG (LOW for adj. Southwick Canal)	NEG	NEG (LOW - Lady Bee Marina/Southwick Canal only)	MED (mudflats, saltmarsh, jetty/pontoon structures, timber baulking, small beach etc.)
	Migrating fish (WCA)		NEG	NEG	NEG	NEG (HIGH for adjacent / on-site areas of River Adur)
	Seahorse (WCA)		NEG (LOW for adj. Southwick Canal)	NEG	NEG (LOW for adj. / on-site areas of Southwick Canal)	NEG (LOW for adjacent and on-site areas of River Adur that are sufficiently sheltered)
	Invasive Plant Species (WCA)		adj. embankment with wall cotoneaster	LOW	PRESENT (wall cotoneaster)	LOW
Habitats Present On-site	Scattered trees		✓	✓	✓	✓
	Scattered / dense scrub		✓	✓		✓
	Non-native hedgerows		adj. (Hove Lagoon)	✓		
	Introduced shrubs		✓	✓		✓
	Tall-ruderal		✓	✓	✓	✓
	Ephemeral / short perennial		✓	✓	✓	✓
	Bare ground		✓	✓	✓	✓
	Amenity grassland			✓		✓
	Species-poor semi-improved grassland		✓	✓	✓	✓
	Running water (brackish)					✓ (River Adur)
	Standing water (brackish)		adj. (Southwick Canal)		✓ (Southwick Canal)	
	Scattered / continuous saltmarsh					✓
	Scattered vegetated shingle plants		✓			
	Buildings and hardstanding		✓	✓	✓	✓
	Intertidal mud-flats					✓ (along western half only)
	Intertidal foreshore					✓ (small beach at easter end only)
Designated Sites			Basin Road South SNCI adjacent to south-west boundary			Adur Estuary SSSI adjacent to the western boundary
Habitats of Principal Importance / BAP	Intertidal mudflats (UK/Sussex BAP)					✓
	Coastal saltmarsh (UK/Sussex BAP)					✓ (Sussex Yacht Club)
	Open mosaic habitat (UK/Sussex BAP)				✓ (vacant land at Lady Bee Marina)	✓ (Lennards Wharf)
	Coastal vegetated shingle (UK/Sussex/Brighton)		adjacent at Basin Road South SNCI			adjacent at Kingston Beach but limited in extent

Table 5: Summary of Baseline Ecology Information for Strategic Sites

Feature		Strategic Site			
		Aldrington Basin	South Portslade	Southwick Waterfront	Western Harbour Arm
Species of Principal Importance / BAP	Species present (P) or potentially present due to suitable habitat	House sparrow(P)/dunnock (UK/Sussex) Herring gull(P)/starling (UK/Sussex/Brighton) Bats general (Brighton), soprano pipistrelle/brown long-eared (UK/Sussex) Seahorses (UK/Sussex/Brighton)	House sparrow(P)/dunnock (UK/Sussex) Herring gull(P)/starling (UK/Sussex/Brighton) Bats general (Brighton), soprano pipistrelle/brown long-eared (UK/Sussex) Slow worm/common lizard (UK/Sussex)	House sparrow/dunnock (UK/Sussex) Herring gull(P)/starling (UK/Sussex/Brighton) Bats general (Brighton), soprano pipistrelle/brown long-eared (UK/Sussex) Slow worm/common lizard White-letter hairstreak butterfly - recorded for Aldrington Basin, with elm present on North Canal Bank to the east (UK/Sussex) Seahorses (UK/Sussex/Brighton)	House sparrow/dunnock (UK/Sussex) Herring gull(P)/starling (UK/Sussex/Brighton) Bats general (Brighton), soprano pipistrelle/brown long-eared (UK/Sussex) Slow worm/common lizard (UK/Sussex) seahorses (UK/Sussex/Brighton) European eel(P)/sea trout(P) (UK/Sussex) in R.Adur Sea heath (UK/Sussex/Brighton) and sea barley (UK/Sussex) both recorded with regeneration area (Southwick Beach) and could be present along estuary edge at Sussex Yacht Club etc.
Secondary or supporting value		Grass bank to north is part of a chain of linear wildlife corridors along the A259 and which acts as a stepping stone to SS2. Provides a buffer to Southwick Canal – a linear waterbody extending east-west for 2.6km before joining the River Adur. Provides a buffer to Basin Road South SNCI.	Frontages on Wellington Road are part of a chain of linear wildlife corridors along the A259 and which act as a stepping stone to SS1.	Provides a buffer to Southwick Canal – a linear waterbody extending 2.3km west to Aldrington Basin and joining the River Adur to the west.	Eastern half of site has frontage onto the River Adur with the western half forming part of The River. Provides a buffer to River Adur SSSI which is adjacent to its west boundary.
Protected Species – each strategic site has been assessed for its potential to support protected species/species groups. These are ranked using NEGLIGIBLE/LOW/MEDIUM/HIGH/PRESENT following the methodology outlined in Section 2. The potential for roosting bats is based on the suitability of buildings/structures following the bat assessment. The number of individual buildings/structures assessed for each rank is shown in parenthesis with the highest rank shown in bold. The legislation afforded to each species/species group is abbreviated as follows: WCA = Wildlife and Countryside Act 1981 (as amended), HabRegs = The Conservation of Habitats and Species Regulations 2010 (as amended), PBA = Protection of Badgers Act 1992. Full details of wildlife legislation is provided in Appendix 7.					

4 Evaluation

SITE EVALUATION

4.1 Habitats and species for the wider Shoreham Harbour Regeneration Area and each Strategic site have been evaluated following standard guidance on ecological impact assessment published by the Institute of Ecology and Environmental Management (IEEM, 2006a) using the following recommended geographic frames of reference:

- Features of International Importance
- Features of National Importance
- Features of County (East Sussex) Importance
- Features of District (Adur/Brighton and Hove) Importance
- Features of Local (Shoreham) Importance
- Features of importance within the immediate vicinity of the site

Shoreham Harbour Regeneration Area

4.2 The *Shoreham Joint Area Action Plan Ecological Scoping Report* (Halcrow, 2009a) evaluated the nature conservation features within and adjacent to the regeneration area. This evaluation is supported by the findings of this report with key features considered to be of value at varying levels i.e. from local up to national, as follows:

- National importance - Adur Estuary SSSI;
- County importance – examples being:
  - Shoreham Beach SNCI/LNR dominated by vegetated shingle;
  - Basin Road South SNCI comprising vegetated shingle and bare ground;
  - Populations of breeding black redstart;
  - Refuge afforded to winter birds by Southwick Canal;
- Local importance – examles being:
  - Grassland/scrub mosaics along the North Canal Bank; and
  - 'Open mosaic habitats' e.g. at Lennards Wharf.

4.3 Adur Estuary SSSI is a statutory nature conservation site, adjacent to the regeneration area and dominated by mudflats and saltmarsh, which are the primary reasons for its notification. The invertebrate and wading bird populations using this habitat are also stated on the SSSI citation sheet (see Appendix 6) as being of national importance.

The coastal grassland adjacent to the SSSI performs a buffering role and supports a high population of reptiles in localised areas, which are also named on the SSSI citation.

4.4 Shoreham Beach LNR/SNCI and Basin Road South SNCI are non-statutory nature conservation sites, designated primarily for vegetated shingle which supports a range of protected, rare and notable plants and animals.

Aldrington Basin: Strategic Site 1

4.5 The site is located within a dense urban area, in close proximity to the coast and with canal frontage. It comprises a low diversity of habitats, which are of limited extent, common and widespread within the locality. Overall, these habitats are considered to be of ecological value within the immediate vicinity of the site.

4.6 SS1 supports, or has the potential to support the following protected and/or species of principal importance: breeding and wintering birds; bats; invertebrates; and seahorses. With exception to seahorses, numbers of these species are unlikely to exceed local value for a number of reasons including: the presence of widespread and/or larger populations present locally; the area of suitable and higher quality habitat in the wider landscape and the limited extent of suitable on-site habitat. If seahorses are confirmed as being present any population is considered to be of at least District value due to their high conservation status.

South Portslade: Strategic Site 2

4.7 The site is located within a dense urban area and comprises a low diversity of habitats which are of limited extent, common and widespread within the locality. Overall, these habitats are considered to be of ecological value within the immediate vicinity of the site.

4.8 SS2 supports, or has the potential to support, the following protected and/or species of principal importance; breeding birds; badgers; widespread reptiles (slow-worm and common lizard); bats; and invertebrates.

4.9 Numbers of these species are unlikely to exceed local value for a number of reasons including: the presence of widespread and/or larger populations present locally; the area of suitable and higher quality habitat in the wider landscape and the limited extent of suitable on-site habitat.

Southwick Waterfront: Strategic Site 3

4.10 The site is located within a dense urban area and is used as a marina with frontage onto a canal. It comprises a low diversity of habitats which are of limited extent and common and widespread within the locality. Overall, these habitats are considered to be of ecological value within the immediate vicinity of the site.

4.11 Vacant land at Lady Bee Marina is of sufficient size i.e. greater than 0.25ha (c.0.34ha) to qualify as the habitat of principal importance - 'Open Mosaic Habitat on Previously Developed Land'. However, it's early successional stages do not currently provide the habitat diversity and heterogeneity to qualify.

4.12 SS3 supports, or has the potential to support, the following protected and/or species of principal importance: breeding and wintering birds; widespread reptiles (slow-worm and common lizard); bats; invertebrates; and seahorses. With exception to seahorses, numbers of these species are unlikely to exceed local value for a number of reasons including; the presence of widespread and/or larger populations present locally, the area of suitable and higher quality habitat in the wider landscape; the limited extent of suitable on-site habitat. If sea horses are confirmed as being present any population is considered to be of at least District value due to their high conservation status.

Western Harbour Arm: Strategic Site 4

4.13 The site is dominated by industrial land-uses and comprises a low diversity of terrestrial habitats which individually are of limited extent, common and widespread within the locality. Overall, these habitats are considered to be of ecological value within the immediate vicinity of the site.

4.14 The mixture of vegetation types at Lennards Wharf are of sufficient size (c.0.58ha) and meet the five criteria for field recognition of this habitat of principal importance - 'Open Mosaic Habitat on Previously Developed Land', as defined by JNCC (2010). It is not, however, an outstanding example of this habitat type and considered to be of local value.

4.15 The southern boundary of the site is both adjacent to and includes part of the River Adur. Intertidal habitats within SS4 include brackish running water, a small area of foreshore (shingle, rocks, artificial substrates), in channel structures (metal sheet piling, timber baulking, jetties/pontoons etc.), mudflats and saltmarsh.

4.16 The narrow band of continuous saltmarsh at Sussex Yacht Club comprises a saltmarsh community that is widespread in the south-east. It is limited in extent (c.0.035ha), relatively species-poor and confined to the concrete block revetment and immediate intertidal mudflat (the latter due to tide/scour). No protected, threatened, nationally rare/scarce, county notable or BAP plant speces were recorded during the survey. Overall it is not considered to be a good example of its type, but nevertheless qualifies as the habitat of principal importance - 'Coastal Saltmarsh'.

4.17 Mudflats within SS4 that are exposed at low tide between Humphrey's Gap and Adur Ferry Bridge cover c.1.3ha. and qualify as the habitat of principal importance - 'Intertidal Mudflat'.

4.18 The western boundary of SS4 is adjacent to Adur Estuary SSSI which, as described above, is of national importance. Both saltmarsh and mudflat at SS4 form part of the wider network of these habitats in Adur Estuary SSSI and are likely to provide a minor supporting role (in particularly mudflats) to the features for which it is designated *viz.* birds. They are therefore considered to be up to District value.

4.19 SS4 supports, or has the potential to support, the following protected and/or species of principal importance: breeding and wintering birds; widespread reptiles (slow-worm and common lizard); bats; invertebrates; and fish including seahorses. With exception to seahorses and invertebrates, numbers of these species are unlikely to exceed local value for a number of reasons including: the presence of widespread and/or larger populations present locally: the area of suitable and higher quality habitat in the wider landscape and the limited extent of suitable on-site habitat. If seahorses are confirmed as being present any population is likely to be of at least District value due to their high conservation status. Due to the range of intertidal habitats present within the River Adur and terrestrial habitats making up Open Moasic Habitat at Lennards Wharf, invertebrate populations may also be up to District value.

GREEN INFRASTRUCTURE ASSESSMENT

4.20 Table 6 below shows the most commonly identified enhancement options across all 15 sites that were assessed as part of this study. These are tree/scrub/hedgerow planting (100%), grassland creation/enhancement (92%) and landscape planting of recognised value to wildlife (58%), with SuDS, green walls and bespoke invertebrate habitat suitable at 50% of sites.

4.21 Grassland is the dominant habitat type across all sites and provides the easiest win in terms of implementation as simple changes to management, such as reducing the number of cuts, would bring GI benefits.

4.22 Whilst Site 11 had only only four options for enhancement identified it has the best example of semi-natural habitats and highest diversity of habitat types of all 15 sites assessed.

4.23 Due to the linear arrangement of these sites (excluding Site 7) they individually provide wildlife corridors (particularly Site 11) and collectively provide a series of 'stepping stones' for wildlife moving east-west across the regeneration area. Connectivity between these areas of greenspace can be improved through private and public realm landscaping to create a green chain extending for over 3.5km between Hove Lagoon and Kingston Beach.

4.24 *Adur District Green Infrastructure Wildlife Corridors Study* (Halcrow, 2010) has already recommended that the A259 be reconfigured to improve the pedestrian and cycle experience and access to the waterfront. This would create a major green corridor running in parallel to the existing National Cycle Route 2 and incorporating the area of coastal grassland [North Canal Bank].

Table 6: Evaluation of Findings of GI Assessment

Enhancement Opportunity	Site 1	Site 2	Site 3	Site 4	Site 5	Site 6	Site 7	Site 8	Site 9	Site 10	Site 11	Site 12	Site 13	Site 14	Site 15	% Sites
Retrofitted green roofs							✓		✓							13
Tree / scrub / hedgerow planting	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓	93
Landscape planting			✓	✓			✓		✓	✓	✓	✓	✓	✓		60
Food production							✓		✓	✓						20
Grassland enhancement / creation	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	93
Sustainable drainage system				✓	✓		✓		✓	✓		✓			✓	47
Green wall		✓	✓	✓			✓		✓			✓				40
Bespoke invertebrate habitat	✓		✓		✓	✓	✓				✓					40
Bird boxes				✓			✓		✓	✓		✓			✓	40
Bat boxes							✓									7
Window boxes / raised planters									✓							7
Other (composting facilities / vegetated shingle creation)							✓							✓		13
Total Number	**3**	**2**	**5**	**6**	**4**	**3**	**11**	**2**	**9**	**6**	**4**	**6**	**3**	**3**	**4**	

5 Conclusions and Recommendations

CONCLUSIONS

5.1 The HRA screening process for the Adur Local Plan and Brighton & Hove City Plan has considered the potential effects on European protected sites. It concluded that there will be no significant impacts on these sites and that an Appropriate Assessment is not required for either of these plans or the Shoreham Harbour regeneration project. In agreement with Natural England, a Habitats Regulations Statement has been produced to summarise this position, which will be published with the proposed submission JAAP.

Shoreham Harbour Regeneration Area

5.2 The regeneration area covers an area of c.302ha and, despite being dominated by buildings and hardstanding, it includes a range of semi-natural habitat types, including four habitats of principal importance i.e. intertidal mudflats, saltmarsh, vegetated shingle and open mosaic habitat on previously developed land. Habitats of highest ecological value are mainly associated with the estuary of the River Adur and coastline on either side of the harbour mouth at Shoreham Beach and Southwick Beach.

5.3 Designated sites present within the regenation area include Adur Estuary SSSI, Shoreham Beach LNR/SNCI and Basin Road South SNCI. Adur Estuary SSSI is adjacent to the western boundary of the regeneration area and specifically SS4. The eastern end of Shoreham Beach SNCI (c. 2.2ha) is within the regeneration area. A large part of the SNCI is also designated as a Local Nature Reserve (LNR) whose boundary is adjacent to the harbour mouth of the regeneration area. Basin Road South SNCI is located at the eastern end of the regeneration area, adjacent to SS1.

5.4 Overall, key features within and immediately adjacent to the regeneration area are considered to be of ecological value at varying levels from local through to national for Adur Estuary SSSI.

Adur Estuary SSSI

5.5 Adur Estuary SSSI is a statutory nature conservation site notified for its estuarine plant communities and intertidal mudflats that support nationally significant populations of wading birds. Large populations of common lizard are also included on the citation. The SSSI receives legal protection under the Wildlife and Countryside Act 1981 as amended by the CROW Act 2000 and NERC Act 2006 and any direct or indirect

impact on this SSSI, or the species for which it is notified, as a result of development should be avoided.

5.6 The entire regeneration area is within the Impact Risk Zone for Adur Estuary SSSI with development proposals to the west of the harbour mouth at SS4 presenting the highest potential risk to the SSSI. Consultation with Natural England is required as part of wider consultation (see *Stakeholder Consultation* below).

5.7 The most likely impact on the SSSI of wider work across the regeneration area is from the proposed flood defence upgrade. The Technical Annexe of *Shoreham Harbour Flood Risk Management Guide SPD* (Shoreham Harbour Regeneration, 2015b) identifies a number of flood defence options for the Western Harbur Arm (SS4) as having the potential to adversely affect the special interest of Adur Estuary SSSI.

5.8 Policy 31 of Proposed Submission Adur Local Plan (2014) states that: '*All development should ensure the protection, conservation, and where possible, enhancement of biodiversity and if significant harm cannot be avoided (by locating on an alternative site with less harmful impacts), adequately mitigated, or compensated for, then planning permission should be refused. Proposed developments which would adversely affect a SSSI (individually or cumulatively) will not normally be permitted. Exceptions will only be made where the benefits of the development on the particular site clearly outweigh both the impacts that it is likely to have on the features of the site that make it of special scientific interest and any broader impacts'.*

5.9 The Technical Annexe states the following:

- Impacts of any flood defence scheme would need to be assessed further during the development of the preferred concept option so as to inform its detailed design and the requirement for appropriate mitigation measures;
- A number of surveys and assessments would be required to gain a more detailed understanding of the environmental baseline and potential issues/risks and that these surveys would need to be agreed in advance through consultation with ADC and relevant statutory bodies; and
- The preferred concept option would require formal screening by ADC to determine the requirement for an Environmental Impact Assessment (EIA).

Shoreham Beach SNCI/LNR and Basin Road South SNCI

5.10 Shoreham Beach SNCI (also designated as an LNR) and Basin Road South SNCI are non-statutory sites designated primarily for their vegetated shingle habitat which support a range of protected, rare and notable plants and animals.

5.11 Whilst the vegetated shingle present within Basin Road South SNCI is not considered to be an outstanding example of its type, and it currently covers only c.40% of the SNCI area it nonetheless represents the largest example of this internationally important habitat type in Brighton and Hove and also has the potential for enhancement.

5.12 Vegetated shingle is habitat of principal importance and BAP habitat for Brighton and Hove and Sussex. Under the National Planning Policy Framework (NPPF) 2012 and the NERC Act 2006 it is of principal importance for biodiversity and of material consideration in the planning process. Additionally, under Policy NC4 of Brighton and Hove Local Plan (2005) and Policy 31 of Proposed Submission Adur Local Plan (2014) any adverse impact, on the nature conservation features of SNCIs is of material consideration in the planning process. It is recommended that, where possible, works that may result in the loss of, or other impacts on, these SNCI habitats are avoided. These habitats should be retained and protected, except where loss is unavoidable after alternative options are sought, and only after an appropriate programme of mitigation, compensation and enhancement has been put in place.

5.13 The potential for creation of coastal vegetated shingle on Southwick and Portslade Beaches is high. This coastal frontage provides good opportunities for any necessary compensation required due to impacts to/loss of coastal vegetated shingle within the regeneration area as well as for enhancements aiming to increase the overall extent of this rare and internationally important habitat.

Aldrington Basin: Strategic Site 1

5.14 There are no statutory or non-stautory designated nature conservation sites within SS1. Basin Road South SNCI is adjacent to the south-west boundary and any impact on this non-statutory designated site is of material consideration in the planning process and should wherever possible be avoided.

5.15 Overall, the habitats present are considered to be of ecological value within the immediate vicinity of the site.

5.16 SS1 supports, or has the potential to support, a range of protected and/or species of principal importance including breeding birds; bats; invertebrates and seahorses. With exception to seahorses, populations of these species are considered to be up to local value. Due to their high conservation status any population of seahorses confirmed as present are considered to be of at least District value.

5.17 Potential effects resulting from development at SS1 include the following:

- Loss or damage to parts of Basin Road South SNCI;
- Pollution of Southwick Canal, connected to Adur Estuary SSSI; and
- Impacts to protected and/or species of principal importance.

5.17 To avoid these potential impacts a number of mitigation measures, including further survey, are recommended (see below).

South Portslade: Strategic Site 2

5.18 There are no statutory or non-stautory designated nature conservation sites within SS2. Overall, the habitats present are considered to be of ecological value within the immediate vicinity of the site.

5.19 SS2 supports, or has the potential to support, a range of protected and/or species of principal importance including breeding birds; badgers; widespread reptiles (slow-worm and common lizard); bats; and invertebrates. Populations of these species are considered to be up to local value.

5.20 Potential effects resulting from development at SS2 are centred on impacts to protected and/or species of principal importance. To avoid these potential impacts a number of mitigation measures, including further survey, are recommended (see below).

Southwick Waterfront: Strategic Site 3

5.21 There are no statutory or non-stautory designated nature conservation sites within SS3. Overall, the habitats present are considered to be of ecological value within the immediate vicinity of the site.

5.22 SS3 supports, or has the potential to support, a range of protected and/or species of principal importance including breeding birds; widespread reptiles (slow-worm and common lizard); bats; invertebrates; and seahorses. With exception to seahorses,

populations of these species are considered to be up to local value. Due to their high conservation status any population of seahorses confirmed as present are considered to be of at least District value.

5.23 Potential effects resulting from development at SS3 include the following:

- Pollution of Southwick Canal, connected to Adur Estuary SSSI; and
- Impacts to protected and/or species of principal importance.

5.24 To avoid these potential impacts a number of mitigation measures, including further survey, are recommended (see below).

Western Harbour Arm: Strategic Site 4

5.25 There are no statutory or non-stautory designated nature conservation sites within SS4, but Adur Estuary SSSI is adjacent to the west boundary. As dicussed above, this is a statutory site notified for its estuarine plant communities and intertidal mudflats and any direct or indirect impact on this SSSI, or the species for which it is notified, as a result of development, should therefore be avoided.

5.26 In regards to terrestrial habitats present at SS4, Open Mosaic Habitat at Lennards Wharf is considered to be of local value, with all remaining habitats being of ecological value within the immediate vicinity of the site.

5.27 Intertidal habitats are the most ecologically important parts of the site and include c.0.035ha of saltmarsh and c.1.3ha of mudflats – both habitats of principal importance, but with the saltmarsh being of limited extent and not considered to be a good example of its type. They both form part of the wider network of saltmarsh and mudflat in the River Adur Estuary and are likely to provide a minor supporting role to some of the features for which the SSSI is notified *viz.* wading birds. These habitats are therefore considered to be up to District value.

5.28 SS4 supports, or has the potential to support, a range of protected and/or species of principal importance including breeding and wintering birds; widespread reptiles (slow-worm and common lizard); bats; invertebrates; and fish including seahorses. With exception to seahorses and invertebrates, populations of these species are considered to be up to local value. Due to their high conservation status any population of seahorses confirmed as present are considered to be of at least District value. Due to the range of intertidal and terrestrial habitats present within on-site areas

of the River Adur and at Lennards Wharf, respectively, invertebrate populations may be up to District value.

5.29 Potential effects resulting from development at SS4 (excluding flood defence works) include the following:

- Loss or damage (through pollution, shading, changes to river hydrology etc.) to parts of Adur Estuary SSSI;
- Loss or damage (through pollution, shading, changes to river hydrology etc.) to undesignated parts of the River Adur;
- Disturbance to wading birds using the River Adur (both within and outside the SSSI) during construction and operational phases;
- Loss of Open Mosaic Habitats; and
- Impacts to protected and/or species of principal importance, including disturbance to the migration of sea trout and European eel.

5.30 To avoid these potential impacts a number of mitigation measures, including further survey are recommended (see below).

RECOMMENDATIONS

Environmental Impact Assessment

5.31 The proximity of the development to Adur Esturay SSSI, in particular SS4, is highly likely to trigger the requirement for an EIA and a screening opinion for individual developments will be required.

5.32 As discussed above, the preferred concept option of the flood defence works will also require formal screening by ADC to determine the requirement for an EIA.

Consultation

5.33 Where individual developments are adjacent to Southwick Canal or The River Adur it may be necesary to consult with Natural England and the Environtment Agency. Confirmation on the need for seahorse surveys should be sought with Natural England (see *Further Survey Work* below).

Green Infrastructure Strategy

5.34 The GI assessment carried out as part of this study has identified the function of 14 greenspaces located along the A259, both as individual wildlife corridors, but also as a series of 'stepping stones' for wildlife. It has also outlined methods to improve the GI

value of each of these sites. Following *Adur District Green Infrastructure Wildlife Corridors Study* (Halcrow, 2010) it is recommended that the A259 be developed as a key GI route across the regeneration area. In consultation with the regeneration partnership it has been agreed that a GI strategy for Shoreham Harbour will be written, incorporating the proposed A259 green corridor.

5.35 There is also an opportunity to connect existing areas of coastal vegetated shingle to create a continuous corridor of this rare and internationally important habitat along Southwick and Portslade Beaches as part of an enhanced green infrastructure network. This can form part of any necessary compensation required due to impacts to/loss of coastal vegetated shingle within the regeneration area as well as for enhancements aiming to increase its overall extent.

Further Survey Work

Overview

5.36 To extend the baseline of ecological data and mitigate against any potential impact on rare, notable and protected species/habitats across the regeneration area and at each strategic site further surveys as summarised in Table 7 are recommended. Further detail on each survey is provided in the proceeding section.

5.37 The surveys recommended below assume the loss or degradation of suitable habitat. There is potential to avoid and/or limit impacts through habitat retention and protection (see below). The final approach to surveys will need to be based on consideration of detailed proposals for development as they come forward though, in all cases, published best practice should be followed with regard to survey methodology.

Table 7: Summary of Recommended Further Surveys

Survey Type	Strategic Sites				Other Survey Areas
	1	2	3	4	
Bats (building inspections)	✓	✓	✓	✓	
Reptile					North Canal Bank
Botanical/Habitat					North Cananl Bank
Breeding Bird					Southwick and Shoreham Beaches, North Canal Bank
Black Redstart	✓				Warehouses and compounds adjacent to Southwick Canal
Badger (Pre-Construction Check)		✓			North Canal Bank
Invertebrate (Aquatic)				✓	

Table 7: Summary of Recommended Further Surveys

Survey Type	Strategic Sites				Other Survey Areas
	1	2	3	4	
Invertebrate (Terrestrial)				✓	High quality Open Mosaic Habitat sites across regeneration area
Seahorse (TBC with Natural England)	✓		✓	✓	Southwick Canal and River Adur

Bats

5.38 If any of the built structures that are present within Shoreham Harbour regeneration area are proposed to be demolished or re-developed in the future, the following recommendations are provided to ensure the works are carried out in compliance with the legislation afforded to bats. The results of building inspections should be used to inform bat emergence and/or re-entry surveys, where required. If any of the structures scheduled for demolition are confirmed to be in use by roosting bats, then a European Protected Species Mitigation (EPSM) Licence detailing an appropriate level of on-site mitigation likely be required, prior to demolition or re-development works commencing.

5.39 Buildings with High Potential – Should be subject to a thorough internal and external building inspection by a licensed bat specialist to help determine presence or likely absence of roosting bats. In accordance with good practice guidelines, further bat surveys proposed would comprise three dusk emergence and/or pre-dawn re-entry surveys (Hundt, 2012). All features identified as having potential to provide access/egress for bats would be observed by suitably experienced surveyors. Surveys to assess the status of a roost must be carried out during the optimum survey season of May to August. Ideally, surveys would be spread across the survey season as far as is practicable, in order to provide robust and representative data on which to base the subsequent assessment and to ensure that recommended mitigation is appropriate and proportionate.

5.40 Buildings with Moderate Potential – Should be subject to a thorough internal and external building inspection by a licensed bat specialist to help determine presence or likely absence of roosting bats. In accordance with good practice guidelines, further bat surveys proposed would comprise two or three dusk emergence and/or pre-dawn re-entry surveys (Hundt, 2012). All features identified as having potential to provide access/egress for bats would be observed by suitably experienced surveyors. Surveys to assess the status of a roost must be carried out during the optimum survey season of May to August. Ideally, surveys would be spread across the survey season as far as is practicable, in order to provide robust and representative data on which to base the

subsequent assessment and to ensure that recommended mitigation is appropriate and proportionate.

5.41 Buildings with Low Potential – Should be subject to a thorough internal and external building inspection by a licensed bat specialist to help determine presence or likely absence of roosting bats. In accordance with good practice guidelines, further bat surveys proposed would comprise one dusk emergence or pre-dawn re-entry surveys (Hundt, 2012). All features identified as having potential to provide access/egress for bats would be observed by suitably experienced surveyors. Surveys to assess the status of a roost must be carried out during the optimum survey season of May to August.

5.42 Buildings with Negligible Potential – No further bat surveys are considered necessary.

5.43 Buildings not assessed - Should be subject to a thorough internal and external building inspection by a licensed bat specialist to determine their potential to support roosting bats and, where possible, their presence or likely absence. Bat activity surveys may or may not be required depending upon the level of potential of the buildings to support roosting bats.

Reptiles Survey

5.44 Reptile habitat at each strategic sites was very limited in extent and quality. Four areas had low potential to support reptiles i.e. grass frontages along A259 (SS1), connected private gardens (SS2), vacant land at Lady Bee Marina (SS3) and Open Mosaic Habitat at Lennards Wharf (SS4). The latter two sites are likely to become more suitable for reptiles as vegetation matures, but currently a reptile survey is not recommended. Depending on the management of these four sites prior to development and the scale of development proposed, it may be necessary to carry out a reptile survey and each site should be re-assessed at least two years prior to development.

5.45 Reptile surveys of two of the six south-facing embankments running parallel with the A259 were carried out in 2009. The results of these surveys are invalid for planning purposes and it is recommended that a re-survey of The North Canal Bank (See Enhancement Site 11 in Appendix 2) is carried out. Methodology should follow current guidelines (Froglife, 1999; English Nature, 2004) and ideally start two years ahead of the proposed works in this part of the regeneration area. Should any other

embankments be impacted by future works reptile surveys in these locations (or parts of them) may also be required.

5.46 Subject to the findings of these surveys and proposed works it may be necessary to carry out further reptile mitigation including translocation. Outline enhancement and receptor site options for the North Canal Bank were presented in the Shoreham Harbour JAAP Area - Summary of Phase 2 Ecological and Green Infrastructure Studies (Halcrow, 2009f). This stated that the ecological value of North Canal Bank should be maintained but, where impacts on reptiles are unavoidable, to translocate reptiles to an appropriate site. A number of potential receptor sites were identified including Lancing Brooks grassland areas/Adur Recreation area and tidal section of the River Adur. Any receptor sites would need to be evaluated in the event that translocation is required with habitat enhancements/surveys carried out where appropriate.

Habitat/Botanical Survey

5.47 The North Canal Bank (Enhancement Site 11) is an important greenspace within the regeneration area, parts of which may be affected by wider development proposals. It is dominated by grassland with some areas containing a diverse range of plant species. It is recommended that a more detailed botanical/habitat survey is carried out to accurately inform long-term scrub and grassland management, with a view of changing the current mowing regime to benefit wildlife.

Breeding Bird Survey

5.48 The *Shoreham Harbour JAAP Area - Summary of Phase 2 Ecological and Green Infrastructure Studies* (Halcrow, 2009f) recommends a breeding bird survey, particularly for Southwick and Shoreham beaches which are known to support small breeding populations of ringed plover, despite high levels of usage for recreational purposes. . It is considered that this survey is only needed where works will potentially impact suitable habitat for ground nesting birds such as ringed plover during their breeding period i.e. March toJuly (inclusive).

5.49 The North Canal Bank should also be surveyed as it provides a large area of relatively undisturbed dense scrub for breeding, which may support declining species such as linnet and starling *Sturnus vulgaris*.

5.50 A survey to determine the species and numbers of breeding birds at The North Canal Bank should be carried out broadly following standard Common Bird Census (CBC)

methodology (Gilbert *et al.*, 1998). This will ensure that any potential future works have minimal impact on less common species and inform mitigation and future management plans for this part of the regeneration area.

Black Redstart Survey

5.51 *The Review of the Birds of Shoreham Harbour* (The Ecology Consultancy, 2009b) recommended that a survey be undertaken to determine the breeding status of black redstart, whose populations at Shoreham Harbour may, in certain years, be of county value. The warehouses and compounds adjacent to Southwick Canal were identified as offering suitable breeding habitat. Survey methodology should follow accepted guidelines (Gilbert *et al.*, 1998) and the results of the survey be used to inform mitigation for the potential loss of both foraging and breeding habitat.

Badger (Pre-Construction Check)

5.52 Suitable sett-building and foraging habitat at each of the strategic sites was limited in extent and quality with only SS2 having potential (low) to support badgers. As a precaution, it is recommended that a pre-construction check of the frontages on Wellington Road (A259) and back gardens of domestic properties be carried out, where development of these areas is proposed. Within the regeneration area, badgers are considered most likely to occur along the North Canal Bank. Where development of the North Canal Bank is to take place, a pre-construction check for evidence of badger should also be carried out.

Aquatic Invertebrate Survey

5.53 A variety of intertidal habitats are present within SS4 including brackish running water, a small area of foreshore (shingle, rocks, artificial substrates), in-channel structures (metal sheet piling, timber baulking, jetties/pontoons etc.), mudflats and saltmarsh. Development proposals for Sussex Yacht Club and flood management options outlined in the *Shoreham Harbour Flood Risk Management Guide SPD* and its *Technical* Annexe (Shoreham Harbour Regeneration, 2015a; 2015b) include incursion into the intertidal zone and the loss of intertidal mudflats and existing river wall. It is recommended that transects are employed to carry out sampling of the intertidal faunal communities, foreshore sediment and mural (river wall) habitats to include surface searches for larger invertebrates, macrophytes and wall plants.

Terrestrial Invertebrate Survey

5.54 Lennards Wharf comprises a moderate diversity of habitat types and structure given its size (0.58ha). It qualifies as Open Mosaic Habitat which typically supports a rich invertebrate assemblage. One of the principal reasons for wasteland's designation as a habitat of principle importance is its importance for invertebrates and therefore a further survey is recommended. Surveys should be carried out between May and June and should aim to provide baseline information to inform the mitigation for any loss of this habitat.

5.55 Three other areas of potential or qualifying Open Mosaic Habitats have been identified across the regeneration area. Where these are to be impacted by development proposals the need for an invertebrate survey should be assessed.

Seahorse Survey

5.56 No seahorses were found during the 2009 survey but the presence of potential seahorse habitat and anecdotal sightings off Shoreham suggested that they are very likely to be found in the regeneration area including Southwick Canal. The level of sampling conducted also suggested that if they do occur they are only likely to be present in low numbers.

5.57 As discussed for aquatic invertebrate surveys above, incursion into the intertidal zone and the loss of intertidal mudflats and existing river wall is an option being appraised. *Shoreham Harbour JAAP Area - Summary of Phase 2 Ecological and Green Infrastructure Studies* (Halcrow, 2009f) concluded that, based on findings of the 2009 marine surveys, that further surveys using divers would not likely yield observations of seahorses due to their likely low density in the area (if present). However, it was qualified that such a survey may be required by Natural England and, on this basis, it is recommended that further consultation is sought. If further surveys are required these should be conducted across Southwick Canal, The Eastern Harbour Arm and The Western Harbour Arm to fully determine the potential impacts of development at SS1, SS2, SS4 and wider flood management work on seahorse species.

MITIGATION

Habitat Retention and Protection

5.58 For reasons explained above there should be a presumption against any impact on Adur Eastuary SSSI, Shoreham Beach LNR/SNCI and Basin Road South SNCI. These sites/habitats should be retained and protected, except where loss is unavoidable

after alternative sites have been sought, and only after an appropriate programme of mitigation, compensation and enhancement has been put in place.

Intertidal Mudflats and Saltmarsh

5.59 A series of options for flood risk management and river wall upgrades along the Western Harbour Arm are outlined in Shoreham Harbour Regeneration (2015a; 2015b). Flood defence works within SS4 have the potential to result in adverse impacts or permanent loss of intertidal habitats. This includes c.0.035ha of saltmarsh and c.1.3ha of mudflats. Adur District Council is also exploring alternative flood defence options that may be set further back from the river. This would minimise any adverse impact or loss of habitat.

5.60 Guiding Principle FRMG5 Intertidal Compensatory Habitat of the *Shoreham Harbour Flood Risk Management Guide SPD* states that *'Any scheme must avoid causing harm to biodiversity in the first instance. If it cannot be avoided then the impacts need to be adequately mitigated, or, as a last resort, compensated for according to the National Planning Policy Framework. Schemes should incorporate measures designed to deliver ecological enhancements. Consultation with the Environment Agency is necessary for proposals which encroach into the river environment. For such schemes, applicants should:*

- *avoid negative ecological impacts*
- *reduce negative impacts that cannot be avoided; and*
- *compensate for any remaining significant negative ecological impacts*

5.61 *Where compensatory intertidal habitat is required, applicants should:*

- *calculate the area of habitat loss through undertaking up-to-date surveys;*
- *compensate for habitat loss on a like for like basis, providing the same area and quality of habitat being lost;*
- *Identify / deliver sites for compensation appropriate to habitats and species they are designed to support.*

5.62 *For further guidance review the Chartered Institute of Ecology and Environmental Management technical guidance. Management agreements should be included as part of the planning application for sites of compensatory habitat to ensure the long term integrity for wildlife benefit'.*

5.63 It is recommended that flood defence options be designed to include full replacement (compensatory) habitat and, where possible, an overall net gain for biodiversity. To achieve this linear intertidal mudflats could be created as an integral part of the upgraded river wall and include micro-habitats such as rock pools and vertical substrates for algal and mollusc growth etc. The upper zone of the river wall could include ledges and/or vertical beaches above the intertidal zone to create other coastal habitats such as flower-rich coastal grassland and vegetated shingle.

Water Courses

5.64 Mitigation for potential impacts to Southwick Canal, the River Adur and associated wetland features should follow the Environment Agency's Pollution Prevention Guidelines (PPGs). PPGs include both general guidance on the prevention of pollution (such as PPG1 and PPG5) as well as specific guidance on subjects such as the storing and handling of materials/products, site drainage and dealing with sewage and trade effluents (Environment Agency, 2007). Details on how wetland features and water courses are to be protected from pollution during development should form part of the wider Construction Environmental Management Plan (CEMP) for each development. Any development proposals should also ensure that river frontages are buffered by planting/SuDS (without increasing shading) to provide adjacent habitat and reduce risk of run-off from hard surfaces.

Migrating Fish

5.65 Common eel and sea trout are known to migrate along the tidal section of the River Adur and any piling as part of flood management works is likely to impede their movement. To mitigate these impacts and the possible deterioration of water quality through the mobilisation of pollutants, it is recommended that piling or any other foundation designs using penetrative methods be avoided, wherever possible. Furthermore, to avoid entrapment of fish and give due consideration to the migration of common eel and sea trout, the following should be employed:

- Non-impact piling methods i.e. push or vibro methods;
- Use of slow start techniques;
- No piling to be carried out at night; and
- If the works are located within the intertidal zone, piling should be undertaken during low tide.

Coastal Vegetated Shingle

5.66 Vegetated shingle will be susceptible to increased recreational pressure leading to e.g. erosion, trampling and nutrient enrichment, direct impacts from access improvements to Basin Road South, including potential boardwalks across the beach, new sustainable transport routes and upgrades to coastal defences.

5.67 It is important to avoid any habitat loss, wherever possible, by reducing the scale of impact through design. This can include, for example, locating beach boardwalks in areas of bare shingle or minimising impact by locating boardwalks in areas of poor quality vegetated shingle and away from any notable, scarce, rare or protected plant species. The protection of vegetated shingle during construction through appropriate exclusion meaures may also be required.

Tool-box talk to Construction Staff

5.68 A Good Practice Guide for Working on Vegetated Shingle Beaches has been developed by The West Sussex Shingle Project (Smith, 2009) for coastal defence engineers and others working on shingle beaches. This document should be made available to construction site staff. In addition a 'tool-box' talk by a suitably experienced ecologist on the nature conservation importance of vegetated shingle and the potential impacts of the proposed works on this habitat and the protected species it supports should be conducted prior to the commencement of works.

Vegetation Clearance and Breeding Birds

5.69 A variety of buildings across all strategic sites provide nesting opportunities for a number of bird species, both internally and externally. The extent of trees, scrub, non-native hedgerow and dense introduced shrubs is generally limited but such habitat, which provides bird nesting opportunities, is present at all strategic sites. Any clearance of buildings and vegetation suitable for breeding birds should be implemented outside the bird nesting season i.e. between September and February (Newton *et al.*, 2011). It is recommended that compensation is provided for any breeding bird habitat lost as an integral part of soft landscaping proposals (see *Landscape Planting* below).

5.70 Any proposals to improve Southwick and Portslade Beaches, in particular consolidated areas of shingle beach that have become vegetated, should also consider the potential presence of ground-nesting birds such as ringed plover. Ringed plover was recorded as nesting at Basin Road South SNCI in 2015 and is a notable species in Brighton and Hove due to the high level of beach use which normally deter

such species. It typically breeds between March and July (inclusive) and works should be timed to avoid this period. Where works cannot be appropriately timed a pre-construction check for ground nesting birds by an experienced ecologist/ornithologist should be carried out.

Invasive Plant Species

5.71 Three invasive plant species included on Schedule 9 of the Wildlife and Countryside Act 1981 (as amended) are present in the eastern half of the regeneration area. These are wall cotoneaster *Cotoneaster horizontalis*, Japanese knotweed *Fallopia japonica* and montbretia *Crocosmia x crocosmiiflora*. Under this Act it is an offence to plant or otherwise cause these species to grow in the wild. Where there is the potential for their spread during development, it is recommended that they be removed and correctly disposed of following best practice guidelines (Defra, 2013).

5.72 Other ornamental species known to be invasive but that are not listed on Schedule 9 were present in the regeneration area such as winter heliotrope *Petasites fragrans*, snow-in-summer *Cerastium tomentosum*, Russian-vine *Fallopia baldschuanica* and Boston-ivy *Parthenocissus tricuspidata*. Whilst it is not an offence to plant or otherwise cause the spread of these plants in the wild it is best practice to mitigate against their potential spread to other areas during construction.

5.73 Guidance on all invasive plant species considered to be a risk during construction should be included in the CEMP, together with detailed methods to prevent their spread and, where necessary, their means of clearance and disposal.

Bats and Lighting

5.74 Research has found that bats can be sensitive to artificial lighting and that excessive lighting can delay bats from emerging, thus shortening the time available for foraging, as well as causing bats to move away from suitable foraging grounds or roost sites, to alternative dark areas (Jones, 2000).

5.75 Currently, large parts of the regeneration area remain dark at night and to minimise indirect impacts from lighting associated with development it may be necessary to have both 'unlit zones' and limit light spillage and glare across other parts of the site. The need or otherwise for lighting controls will be informed by the results of any future surveys. A sensitive lighting scheme can be achieved by following accepted best practice (Institute of Ecology and Environmental Management, 2006: Institute of Lighting Engineers, 2007) and these guidelines:

- All habitats supporting protected species that are sensitive to artificial light such as foraging/commuting bats should remain unlit.
- The level of artificial lighting including flood lighting should be kept to a minimum;
- Where this does not conflict with health and safety and/or security requirements, any identified bat commuting/foraging habitats should be kept dark during peak bat activity periods (0 to 1.5 hours after sunset and 1.5 hours before sunrise;
- Lighting that is required for security or safety reasons should use a lamp of no greater than 2000 lumes (150 Watts) and should comprise sensor activated lamps;
- Low pressure sodium lights are a preferred option to high pressure sodium or mercury lamps;
- Lighting should be directed to where it is needed with minimal light spillage. This can be achieved by limiting the height of the lighting columns and by using as steep a downward angle as possible and/or a shield or hood that directs the light below the horizontal plane; and
- Artificial lighting should not directly illuminate any potential bat roosting features or wildlife corridors of likely value to commuting/foraging bats, such as the harbour/water's edge and grass embankments along the A259. Similarly, any newly planted linear features should not be directly lit.

Tree Protection

5.76 All construction works taking place in the vicinity of retained trees, scrub, introduced shrubs and non-native hedgerows should conform to *British Standard 5837:2012 Trees in Relation to Design, Demolition and Construction* to maintain the integrity of these habitats.

COMPENSATION/ENHANCEMENT

Vegetated Shingle Translocation / Creation

5.77 If impacts to this habitat are unavoidable then translocation will be required. Steps should be taken to translocate all or part of the vegetation to suitable substrate in a nearby receptor site and/or to improve the quality/status of this habitat elsewhere within the regeneration area. The following bullet points provide some options for further consideration once impacts are fully understood:

- Receptor sites should be selected on the basis of a number of factors including; sufficient area as agreed by stakeholders; proximity to translocation site; proximity to existing areas of vegetated shingle for the natural transferral of plant material and presence of a stabilised section of shingle that is weed-free and will

not be disturbed by stochastic events such as storms, erosion through long-shore drift or high recreational pressure (unless it can be appropriately managed);

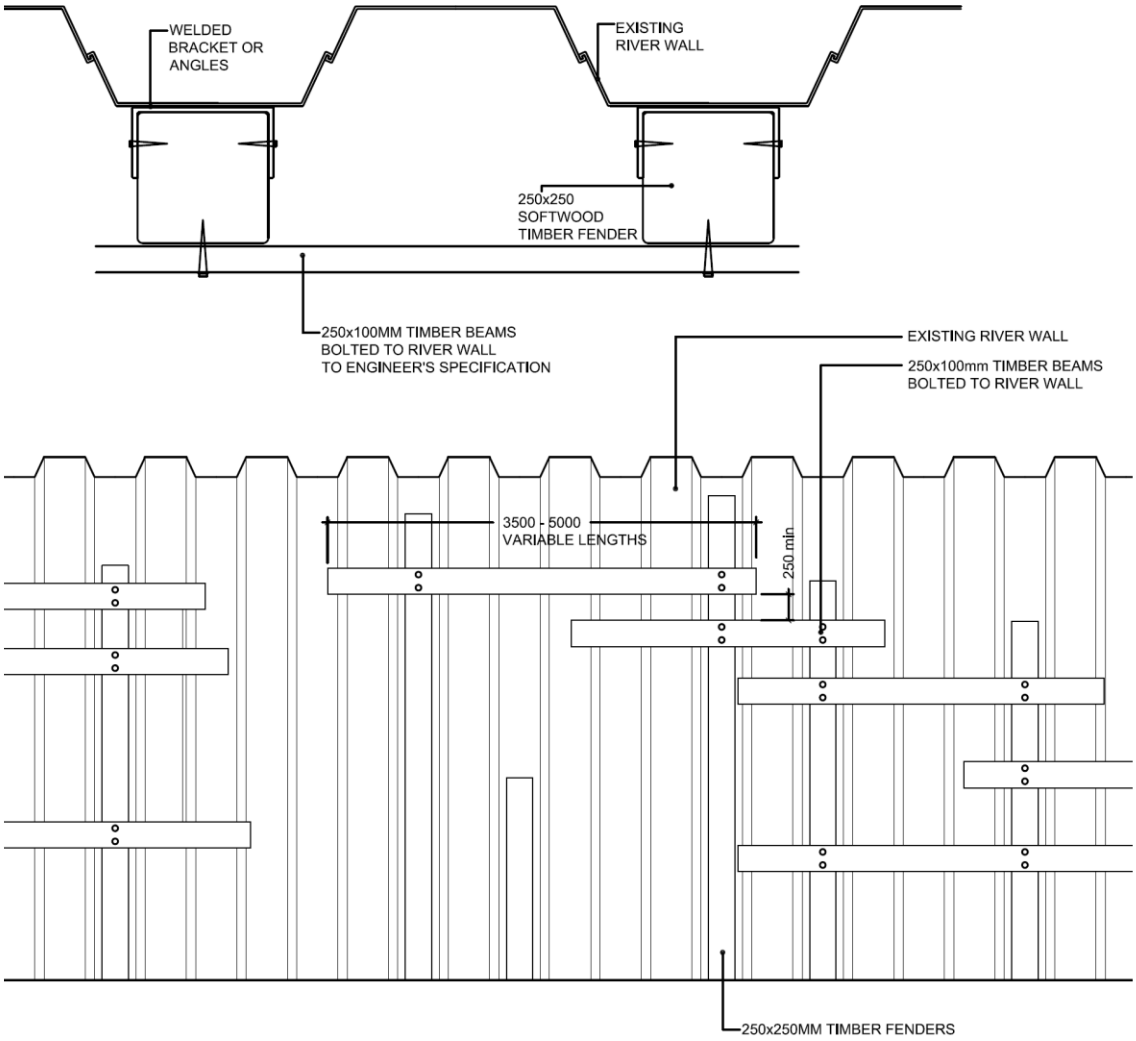
- To translocate targeted plant species from the area to be impacted to other areas of the same habitat nearby. For instance where a particular species or species typical of this habitat is absent;
- The wholesale translocation of this habitat from the area of impact to a commensurate area of suitable substrate nearby, that can be safeguarded from future development/impact;
- To bring into active management other areas of coastal vegetated shingle within the regeneration area that are currently in unfavourable condition;
- In addition to the above; to potentially provide areas of biodiverse green roof and landscape planting that aim to recreate the areas of habitat to be lost (see below).
- A detailed method statement/habitat creation scheme should be drawn up and agreed with ADC, B&HCC and other relevant stakeholders prior to works. Information should be provided on the location and extent of this habitat (via detailed plans), substrate type and depth, plant species, plant material (seed, plug-plant, translocated rosettes of perennials etc.), plant provenance, any programme for translocation and off-site propagation, timing of works, specialist contractors/Clerk of Works, establishment regime, etc.
- A minimum of a two year monitoring programme should be implemented.

River Edge Treatment

5.78 To increase the invertebrate, crustacean and algae biodiversity on river walls within Shoreham Harbour, timber baulking should be attached.This approach is in line with the public realm interpretation for the Harbour Character Area as identified in the Shoreham Harbour Streetscape Guide (BDP, 2012). An outline specification is provided below, with examples of vertical beach creation and renewal of wooden construction creek walls at Deptford Creek in London where a 7m tidal range is present. These are documented in the on-line resource *Estuary Edges: Ecological Design Guidance* (Environment Agency, 2008).

- use of sustainably sourced and untreated hardwood timber;
- fixed to river wall or existing baulking in both horizontal and vertical plane;
- recycling of stock-piled baulking from the locality;
- use of aged/older timber with rough surface to aid attachment; and

- Attachment of a number of taller timbers that extend above the top of the river wall to provide bird perches or platforms for local art installation.



5.79 These timbers would retain moisture when exposed providing a receptive substrate for subsequent colonisation by crustaceans and algae. Baulking also supports an invertebrate assemblage of value to foraging birds, such as black redstarts. Where agreed with the Port Authority, extended upright sections for bird (kingfisher/sand martin *Riparia riparia*/cormorant etc.) perches can be added.

5.80 Where horizontal beams are attached to areas of flat river wall it will be possible to create enclosed planters between horizontal baulking. These should be located at varying heights within the tidal zone to allow sediment to build naturally. The objective should be to allow the planters to be colonised with saltmarsh plants or to be planted where a more instant affect is required. Liaison with the EA and Shoreham Port Authority will be required.

5.81 Where the existing sheet piling river wall is to be replaced, consideration should be given to ecological engineering. Such techniques could include a shelf between the

mean high water neap and spring tides, along the entire length of the Western Harbour Arm so that it is inundated, allowing for the establishment of saltmarsh vegetation or reedbed. The shelf could be back-filled with fine sediments, collected from behind areas of new piling, providing a substrate for the establishment of and a potential source of seed and root/rhizome material. Any planting of reed, sedge, rush or clubrush species etc. should be at a low density with species tolerant of the conditions, allowing natural colonisation to form the main re-vegetation process. The created intertidal substrate would provide habitat for a range of invertebrate species including annelid worms (oligochaetes and polychaete species) that form a food resource for bird and fish species.

5.82 Examples of intertidal planted terraces along the Eastern Wall of Greenwich Peninsula in London are documented in the on-line resource *Estuary Edges: Ecological Design Guidance* (Environment Agency, 2008). These terraces replaced a 1300m length of sheet piling in an area of the Thames with over 7m tidal range.

Timber baulking attached to dock using rubber shoes © Ben Kimpton.

Base of wooden jetty showing epiphytic community within tidal zone © Ben Kimpton.

5.83 Large boulders forming part of the existing artifical rocky foreshore or as part of any new flood defense schemes could be enhanced and as part of an ecological-education project. Cores could be drilled into the stone in-situ to replicate the approach of Bioblocks™ developed by RPC Contracts Ltd and Dr. Firth in collaboration with SEACAMS. The images below and accompanying text (© Louise Firth / Elsevier) are taken from the supplementary online material from a paper published by Coastal Engineering (Firth *et al*. 2014).

Figure S5. The BIOBLOCK at Colwyn Bay, Wales. (a) The unit being lifted into place by a crane; (b) top-down view of unit showing scale and the three faces with multiple habitat types; (c) areas (25 x 25 cm) with pits that are either shallow (2 cm, top) or deep (5 cm, bottom); (d) sidelong view showing longitudinal horizontal crevices.

5.84 Other suitable intertidal projects include the use of 'vertipools' as designed and used in Yarmouth by Eccleston George and Natural Enterprise. These can be attached to existing or proposed vertical flood defence structures.

© Ian Boyd, Arc Consulting

Green Roofs

5.85 Green roofs would compensate for the loss of Open Mosaic Habitats (a habitat of principal importance) and, depending on their extent, could provide an overall net gain for biodiversity. To compensate for the loss of this habitat at ground level it is recommended that it be recreated at roof level by designing biodiverse green roofs. This should include a specification of proven ecological value for foraging birds and invertebrates. Such areas are typified by substrates of varying type and depth, include wood features and open areas of vegetation, are low maintenance and are attractive to people as well as wildlife. They also provide opportunities for natural colonisation by plants and invertebrates. Such roofs are preferable to standard stonecrop *Sedum spp*. roofs as these are usually less species-rich.

5.86 Where required, it is possible to compensate for loss of vegetated shingle habitat through the use of carefully designed green roofs. The type of vegetated shingle should be modelled on that found in more protected beach locations where a consolidated substrate has been allowed to develop. The roofs may also provide areas to translocate plant material to, from scarce/rare species that may be present on-site or across the wider regeneration area.

Issues in Building Design and Construction

5.87 The saturated loading may be higher than typically needed for a biodiverse green roof that uses 100% extensive substrate. A mix of sands and gravels (composition to be agreed) should allow for a load of between 15-20kg per 10mm substrate.

5.88 If ground-nesting birds, such as ringed plover, are to be encouraged to nest/forage then large open areas of shingle roof should be provided, with planting avoided (or at least rationalised) where possible.

5.89 Roofs designed for ringed plover should be in close proximity to water and sited so birds have a view of the surrounding area and potential predators, or so that more open areas suitable for nesting[12] are designed into raised areas of the roof. Areas of

[12] The ringed plover nests on the ground on stones with little or no plant cover.

standing water and vegetation providing cover/foraging on the roof will be required to facilitate reproductive success for ground-nesting birds[13].

Green Roof Substrate

5.90 Substrate type and size should be variable, including shingle, gravel and sand, in addition to proprietary extensive green roof soils. Sand should comprise a minimum of 20% of the surface area. Areas of vegetated and non-vegetated roof should be created.

5.91 Shingle-based roofs should replicate ridges of 100% shingle[14] and 'stable shingle' i.e. older, more consolidated areas at the back of beaches where the voids between larger stones are filled with finer sediments. Such a habitat will be suitable for a wide range of plant species, in turn capable of supporting a range of invertebrates and foraging/nesting birds.

5.92 A limited amount of substrate from Shoreham Beach SNCI or Basin Road South SNCI (as appropriate) could be placed on the roof to provide a seed bank to aid colonisation. This should be collected from the upper horizons of the soil/substrate and avoid areas with weed species.

5.93 Additional features such as logs, boulders and sections of ceramic pipe work should be incorporated into the design. This will provide micro-habitats for invertebrates and cover for nesting birds.

Bird Boxes

5.94 To compensate for the loss of habitats of value to breeding birds it is recommended that artificial bird boxes are included within every phase of each strategic site development. These should include specially designed features within the building structure, for example bird bricks that can be incorporated into walls/facades.

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[13] Ringed plover chicks are precocial i.e. they must find food and water for themselves as soon as they leave the nest. This means they must feed in close proximity to the nest before they learn to fly and can extend their foraging area. Water and vegetation provides a source of invertebrates.

[14] Shingle is sediment with particle sizes in the range of 2-200mm (CIRIA, 2003).

5.95 It is recommended that Schwegler woodcrete boxes should be used as they include a broad range of designs, are long lasting compared to wooden boxes and insulate occupants from extremes of temperature and condensation.

5.96 Any landscape planting should also include the provision of native tree and shrub species of value to foraging and nesting birds (see landscape planting below).

Landscape Planting

5.97 Areas of vegetated shingle habitat should be created within the general landscape of the regeneration area to create net gains beyond the requirement to mitigate/compensate for loss of any vegetated shingle. The method of creation of vegetated shingle habitat by Scottish Power at Shoreham Power Station should be followed by any new developments, in particular the purpose-built shingle banks (formed on a foundation of rubble) which were required under planning conditions (Scottish Power, 2010).

5.98 The use of native and non-native planting in landscape schemes is recommended to both compensate for any loss of habitat and to provide enhancements for wildlife. All non-native planting schemes should comprise a high percentage of species of documented wildlife value[15].

[15] For example as listed on the RHS Gardening with Wildlife in Mind database (http://www.joyofplants.com/wildlife/home.php) or the RHS Perfect for Pollinators Plant and Wildflower lists (https://www.rhs.org.uk/science/conservation-biodiversity/wildlife/encourage-wildlife-to-your-garden/plants-for-pollinators)

The Esplanade in Dover, Kent. Multi award winning scheme 'The Lifting Wave, The Resting Wave, The Lighting Wave' designed by architect - Tonkin Liu. Client – KCC, Sea Change/DCMS/CABE, Dover Harbour Board, Dover District Council. Photograph: Robbie Polley).

Naturalistic planting at the interface between the bare shingle beach and development.

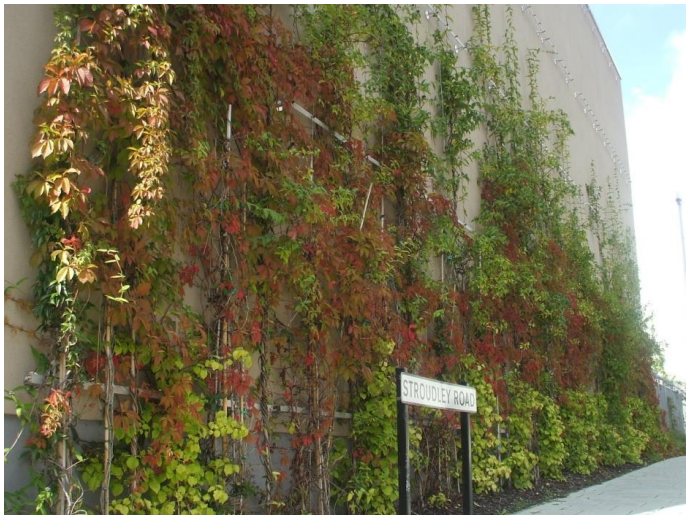
5.99 Liaison between the ecologist/horticulturalist and the landscape architect is encouraged to ensure that external landscape planting maximises its wildlife value and adopts a local habitat approach. This typically includes:

- Improving vegetation structure by combining plants of different physiognomy within the same space, such as bulbs, herbaceous perennials, shrubs, climbers and trees;
- Planting dense groups of shrubs to compensate for the loss of bramble scrub and introduced shrub which provide cover for nesting birds;
- Creating habitats and planting species that provide nectar/pollen supplies for foraging invertebrates;
- Creating foraging habitat for birds by providing berry- and seed-bearing plants;
- Any non-native planting schemes should comprise a high percentage of species of documented wildlife value and should be designed to extend the flowering period providing additional foraging for invertebrates;

- Planting trees that will provide opportunities for nesting birds in the medium-long-term;
- Locating planting to avoid shading of other ecological features such as vegetated shingle;
- The use of invasive species listed on Schedule 9 of the Wildlife and Countryside Act 1981 (as amended) as part of landscape planting, for example Japanese rose *Rosa rugosa* should be avoided;
- Non-Schedule 9 plant species that are potentially invasive or aggressive should also be avoided in areas adjacent to vegetated shingle e.g. red valerian, silver ragwort;
- Double-flowering forms of both native and non-native species, such as 'Flore Pleno', should be avoided.

Green Walls

5.100 There is an opportunity to design in green walls from the outset of any proposed development. It is recommended that these are installed where possible on exterior walls and utilising climbing plants growing on a support structure. The support structure should ideally be placed 50-100mm off the façade.



Climbing green wall with a diversity of native and non-native species. Stroudley Road, Brighton © Ben Kimpton.

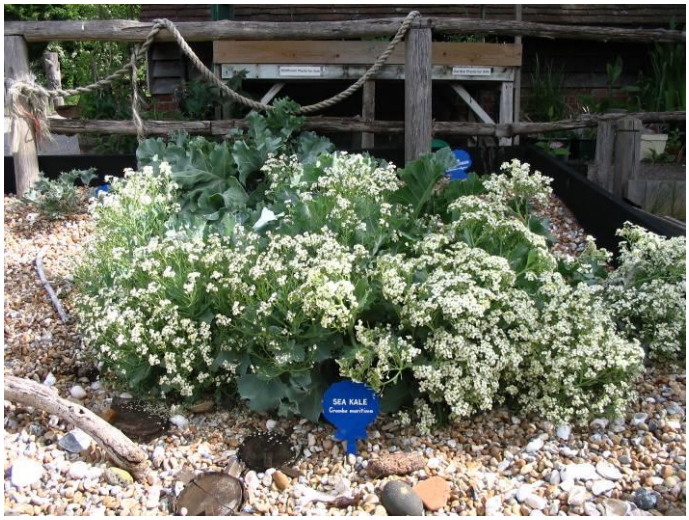
5.101 Plants should comprise native species or non-native species of documented value to wildlife such as berry or nectar-rich plants, including honeysuckle *Lonicera periclymenum*, clematis *Clematis* sp. etc. Such planting will provide nesting opportunities and food resources for birds and invertebrates.

Shingle Planters

5.102 Planters could be utilised as part of the external landscape scheme. They may be of particular use for publically accessible locations where space may be restricted, such as along the waterfront route. Examples of this type of structure/habitat can already be found at Brighton Marina and guidelines on planting have been developed by B&HCC in their *SPD 11: Nature Conservation and Development* (Brighton and Hove City Council, 2010). The following outline specification should be followed:

Planters at Tyland Barn (Kent Wildlife Trust Headquarters) exhibiting shingle habitat in the county © Ben Kimpton.

- The planters should be a minimum of 450mm deep to allow deeper-rooting plants, such as sea kale *Crambe maritima* to establish, and to permit greater water retention.
- No organic matter will be added to the substrate.
- The lower layer i.e. substrate at depth 250mm-450mm should comprise a blend of sand gravel and shingle.



Sea kale growing in c.300-400mm of shingle substrate © Ben Kimpton.

- The upper layer i.e. at depth surface level-250mm should comprise shingle, but with a minimum of 20% of the surface containing sands for the establishment of seed-sown vegetation.
- Stock should comprise a combination of pot-grown (perennial), plug-planted (perennial/annual) and seeded (annual) species;
- Where possible, seeds of local provenance should be collected and raised prior to construction of the planters.
- All other stock should be certified native stock and bought from an approved nursery.

- Pot and plug planting should take place in spring. Seed sowing can take place in spring and/or autumn.
- Long-term irrigation will not be necessary, but to aid establishment watering should take place during planting and in the summer months in the first two years after planting.
- Following B&HCC guidance (2010) appropriate species include:
    - sea kale
    - sea holly *Eryngium maritimum*
    - sea campion *Silene maritima*
    - biting stonecrop *Sedum acre*
    - english stonecrop *Sedum anglicum*
    - viper's bugloss *Echium vulgare*
    - rock samphire *Crithmum maritimum*
    - yellow-horned poppy *Glaucium flavum*

Information Boards

5.103 The use of information boards should be used to describe the character of the beach, its use by foraging and ground-nesting birds, the development of vegetated shingle and its sensitivity to change, and the importance of vegetated shingle habitat at the local, national and international level. The proposed design would be subject to the approval of ADC and B&HCC and should include a shatter and waterproof covering preferably on an oak plinth. Boards could be situated at appropriate locations along the length of the coast from Hove Lagoon to Shoreham Beach.

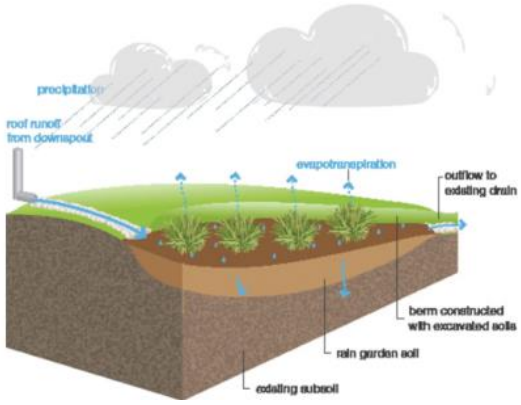
Sustainable Drainage Systems (SuDS)

5.104 A linked system comprising green walls, rain water harvesting, rain gardens, vegetated swales, below ground drainage and porous surfacing utilising materials such as grasscrete[16] should be considered for individual development proposal (see examples below). Such systems can increase biodiversity as well as reduce surface water run-off at the site.

[16] Grasscrete comprises a range of cellular grassed pavement systems made from concrete or plastic and back-filled with recycled materials from the construction process and/or top-soil. The surface can be left to colonise naturally or can be planted with grass and low growing herbs.

5.105 There may also be an opportunity to include small-scale rain gardens as part of landscape planting, including tree pits. Rain gardens should be designed to intercept water running off roofs (via drain pipes) and hard surfaces to reduce both the rate and volume of water discharging into the drainage system. These should be planted with species suitable for rain garden conditions and which provide both amenity and wildlife value.

Rain garden planter providing storm water/SuDS feature and amenity/visual value
(Image: The Green Roof Consultancy).



Cross section of typical domestic rain garden
(Image: Bray *et al.*, 2012).

Rain gardens in Toronto taking surface water from car park and pedestrian areas
(Photos: Dusty Gedge).

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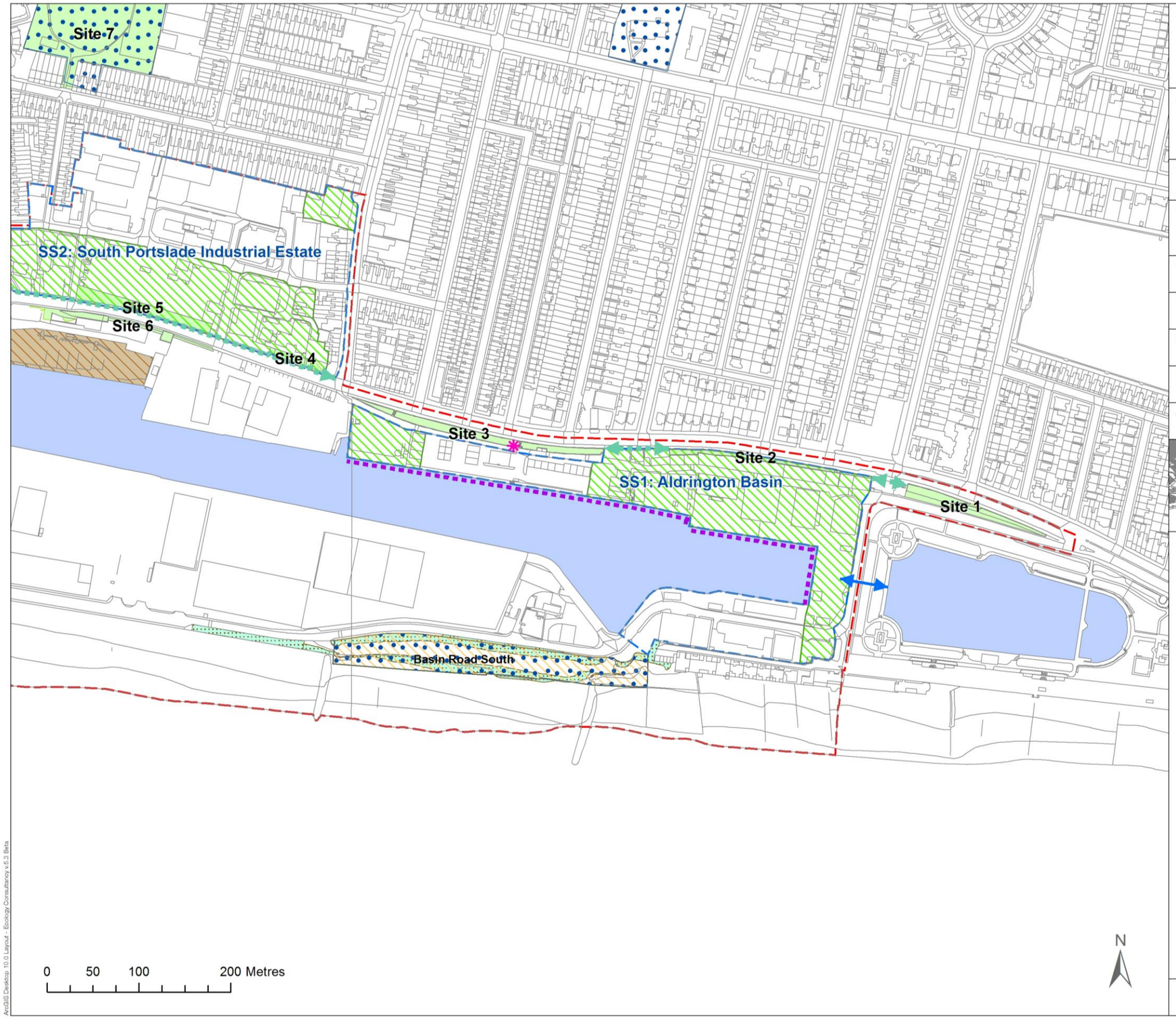
Appendix 1: Ecological Constraints and Opportunities Maps

ECOLOGICAL CONSTRAINTS AND OPPORTUNTIES MAP - ACCOMPANYING NOTES

Site of Special Scientific Interest	Adur Estuary Site of Special Scientific Interest is located adjacent to the regeneration area and specifically the western boundary of SS4. This is a statutory nature conservation site notified for its estuarine plant communities and intertidal mudflats that support nationally significant populations of wading birds. Large populations of common lizard are also included on its citation (see Appendix 6). Any direct or indirect impact on this SSSI, or the species for which it is notified, as a result of development should be avoided. One of the potential impacts to the SSSI is from pollution (see *Watercourse Pollution and Prevention* below).
Local Nature Reserve	Shoreham Beach Local Nature Reserve is adjacent to the west boundary of the regeneration area. It is a statutory designated nature conservation site, but also designated as a SNCI (see below). LNRs are declared for sites holding special wildlife value (in this case vegetated shingle habitat) or geological interest at a local level and are managed for nature conservation whilst providing opportunities for research, education and enjoyment of nature.
Site of Nature Conservation Importance	A small part of Shoreham Beach Site of Nature Conservation Interest is located in the south-west corner of the site at Shoreham Fort. This is a non-statutory site designated for its vegetated shingle habitat. This habitat is particularly vulnerable to recreational pressure including, trampling/erosion etc. This SNCI should be retained and protected, except where loss is unavoidable after alternative development sites have been sought, and only after an appropriate programme of mitigation, compensation and enhancement has been put in place, following Policy 31 of Proposed Submission Adur Local Plan (2014). Basin Road South Site of Nature Conservation Interest is adjcacent to the south-east of the site and SS1. A separate assessment of the SNCI and the potential for vegetated shingle creation on Southwick and Portslade Beach has been carried out by The Ecology Consultancy (2015) and should be read alongside this report. The SNCI is a non-statutory site designated for its vegetated shingle habitat. This habitat is vulnerable to recreational pressure including, trampling/erosion and disturbance to ground nesting birds such as ringed plover. This SNCI should be retained and protected, except where loss is unavoidable, and only after an appropriate programme of mitigation, compensation and enhancement has been put in place, following Policy NC4 of Brighton and Hove Local Plan (2005).
Site 1 Enhancement Site and Number	Opportunities to improve GI assets across the wider regeneration area have been identified (see Appendix 2). The most applicable across all 15 sites assessed include: tree/scrub/hedgerow planting, grassland creation/enhancement and landscape planting of recognised value to wildlife. Only three of these sites are located within strategic sites i.e. strategic site 2, 4 and 5 with Enhancement Site 4 and 5 (in strategic site 2) providing opportunities to improve frontages along Wellington Road (A259). The majority of the 15 sites are publically accessible. Due to their linear arrangement they provide both a wildlife corridor (particularly Site 11) and series of 'stepping stones' for wildlife moving east-west across the regeneration area. Connectivity between these areas of greenspace should be improved as part of general improvements to the public realm (see *A259 Streetscape Planting* below).
Saltmarsh	A habitat of principal importance located in the western end of the regeneration area, predominantly on the southern side of the River Adur. A small area of saltmarsh is also present around the concrete block revetment at Sussex Yacht Club at the western end of SS4 and is likely to provide a minor supporting role to the features for which Adur Estuary SSSI is notified.
Intertidal Mud	A habitat of principal importance located in the western half of the regeneration area on both sides of the River Adur. The area of intertidal mud at the southern end of SS4, extends c.450m from Adur Ferry Bridge to just beyond the Riverside Business Centre and is likely to provide a minor supporting role to the features for which Adur Estuary SSSI is notified.
Open Mosaic Habitat	A habitat of principal importance present or potentially present at four sites across the regeneration area. Only one site at Lennards Wharf is within the strategic sites (SS4). Given the industrial nature of the harbour, particulalrly vacant wharves in SS4, the extent and quality of Open Mosaic Habitat (OMH) is likely to increase during the period of regeneration. OMH typically comprises a variety of habitat types with the potential to support rare plants, invertebrates, birds and reptiles within Shoreham Harbour. Further surveys for these species groups may be required at OMH sites.
Vegetated Shingle	A habitat of principal importance present in several locations in the regeneration area, including; Shoreham Beach SNCI (see above), Basin Road South SNCI, northern end of Kingston Beach and at several scattered locations along Southwick and Portslade Beaches including around Carat's Café. The location and extent of vegetated shingle along Shoreham Beach has not been ground-truthed and is provided by the national dataset for this habitat of principal importance. Development of part of Basin Road South SNCI is proposed by Shoreham Port Aurthority for improved access, which will result in the loss of an area of vegetated shingle. A separate assessment of Basin Road South SNCI and the potential for vegetated shingle creation on Southwick and Portslade Beaches has been carried out by The Ecology Consultancy (2015) and should be read alongside this part of the ECOP. The location and extent of vegetated shingle along the coatal frontage of Southwick and Shoreham Beaches has been provided by this assessment. Wider proposals within the regeneration area include improvements to National Cycle Network (NCN2) and long distance footpath (Monarch's Way) along Basin Road South, better connections to the seafront and interpretation of vegetated shingle habitat. Vegetated shingle is vulnerable to recreational pressure, including erosion, trampling, nutrient enrichment and any proposals to increase access to this habitat (particularly boardwalks) will need to be carefully managed with any potential impacts mitigated.
Invasive Plant Species	Three invasive plant species included on Schedule 9 of the Wildlife and Countryside Act 1981 (as amended) are present in the eastern half of the regeneration area i.e. wall cotoneaster *Cotoneaster horizontalis*, Japanese knotweed *Fallopia japonica* and montbretia *Crocosmia x crocosmiiflora*. Under this Act it is an offence to plant or otherwise cause these species to grow in the wild. Where there is the potential for their spread during development, it is recommended that they be removed and correctly disposed of, following best practice guidelines.

Biodiversity Opportunity Area	Basin Road South SNCI (and Vale Park which is adjacent to the regeneration area and shown on ECOP Map Section A)) form part of the Brighton and Hove Urban Green Network. Opportunities identified for this BOA that are relevant to harbour regeneration include; coastal habitat management, restoration and creation; education and community engagement; urban biodiversity and opportunities associated with development. To the west Shoreham Estuary and Beach BOA connects to the site in two locations. Opportunities identified for this BOA that are relevant to harbour regeneration include; minimising development impacts; invertebrate interest; coastal habitat management, restoration and creation and access improvements.
Watercourse Pollution Prevention and Control	SS1 and 2 are adjacent to Southwick Canal which is connected to the River Adur. SS4 is adjacent to the River Adur and Adur Estuary SSSI. Potential risks to the Southwick Canal, the River Adur and associated wetland features include pollution events. Mitigation should follow the Environment Agency's Pollution Prevention Guidelines (PPGs) which include guidance on the storing and handling of materials/products, site drainage and dealing with sewage and trade effluents. Pollution prevention during development should form part of the wider Construction Environmental Management Plan (CEMP) for strategic site and/or their individual phases of development. Any development proposals should also ensure that river frontages are buffered by planting/SuDS (without increasing shading) to provide adjacent habitat and reduce risk of runoff from hard surfaces.
Connection to Hove Lagoon	Connections between SS1 and Hove Lagoon should be improved. This is best achieved by removing a section of existing non-native hedgerow for a footpath/cyclepath.This should be timed to avoid the breeding bid season as species such as house sparrow are known to nest in this hedgerow.
A259 Streetscape Planting	Enhancing the streetscape along the A259 in the western half of regeneration area provides the opportunity to connect existing green spaces and provide a green chain from Hove Lagoon to Kingston Beach. This would green the main transport route through the regeneration area, and depending on the GI features employed, provide other GI benefits such as buffering of pollution, storm water attenuation, reduction of Urban Heat Island Effect, improvements to visual amenity as well as a green corridor for commuting wildlife. Accepting that there will be limitations due to underground services, access requirements, long-term maintenance etc. the objective should be to use alternating sides of the A259 and a combination of landscape planting such as avenues of street trees, hedgerow/shrub planting, flower-rich grassland and where possible SuDS such as rain gardens, swales and Stockholm tree pits etc.
Potential Green Corridor North of A259	Any long-term mixed-use redevelopment of industrial/warehouse retail sites north of Brighton Road (A259) should its potential to provide an east-west green corridor and buffer to the vegetated railway corridor along tits northern boundary.
North - South Green Corridor	Given that SS4 will be developed in phases, opportunities should be sought to provide green corridors along site boundaries to link the harbour edge (proposed waterfront route) and A259. Where possible these should also connect to any amenity space/pocket parks within SS4. These corridors should include the same landscape planting approaches as described for *A259 Streetscape Planting* above, but may also include green walls. The use of SuDS along these green corridors could provide urban wetlands to replicate the 'Hards' lost during development.
Green Roof and Wall Masterplanning	Given the dense urban nature of development proposals at strategic sites and the importance placed on improving greenspace/frontage along the A259, there is likely to be limited space for greening at ground level. The roof and facades of buildings thereby provide an efficient means to green development and improve the business environment at SS1 and SS2 in accordance with Policy SPAB16 of the JAAP. At SS1 green roofs should be considered for the residential and/or employment led redevelopment particularly any ancillary leisure/retail/visitor attraction providing an entrance to Shoreham Harbour from Wharf Road/Hove Lagoon. At SS2 there are opportunities for green roofs on the employment, mixed-use and residential led redevelopment. Retrofitting green roofs to wharehouse style buildings within the industrial estate is unlikely to be feasible due to low roof loading capacities, but green walls remain an option. Green roofs should be considered for the employment led redevelopment at SS3 and the residential and employment led redevelopment at SS4.
Linear Intertidal Habitat / Vertical Beaches	The redevelopment of SS1, 3 and 4 in conjunction with flood defence upgrades provides a combined opportunity to create new coastal habitats, both as part of compensation for the loss of intertidal habitats in the regeneration area and as general enhancement to create a net-gain in biodiversity. These could also be combined with wider access and landscape improvements such as waterfront viewing areas. Habitats that should be targeted for creation include intertidal mud, intertidal epiphytic communities (seaweed, molluscs etc.), saltmarsh, vegetated shingle, reedbed and flower-rich coastal grassland. The proposed 'Waterfront Route' in SS4 has the greatest potential as continuous habitat/s could be created along its length from Adur Ferry Bridge to Kingston Beach. The 8m setback along the waterfront allows for a variety of structural forms including timber baulking, terracing and vertical beaches which can be designed as an integral part of the sites GI.



The Ecology Consultancy

Job title
Shoreham Harbour Regeneration
ECL Job no. 3333

Client
Adur District Council

Drawing title
ECOLOGICAL CONSTRAINTS AND OPPORTUNITIES MAP

Section:	Scale (at A3)
A	1:4,000

Date of survey: April 2015

Surveyor: Ben Kimpton

Drawn	Checked
RM	BK

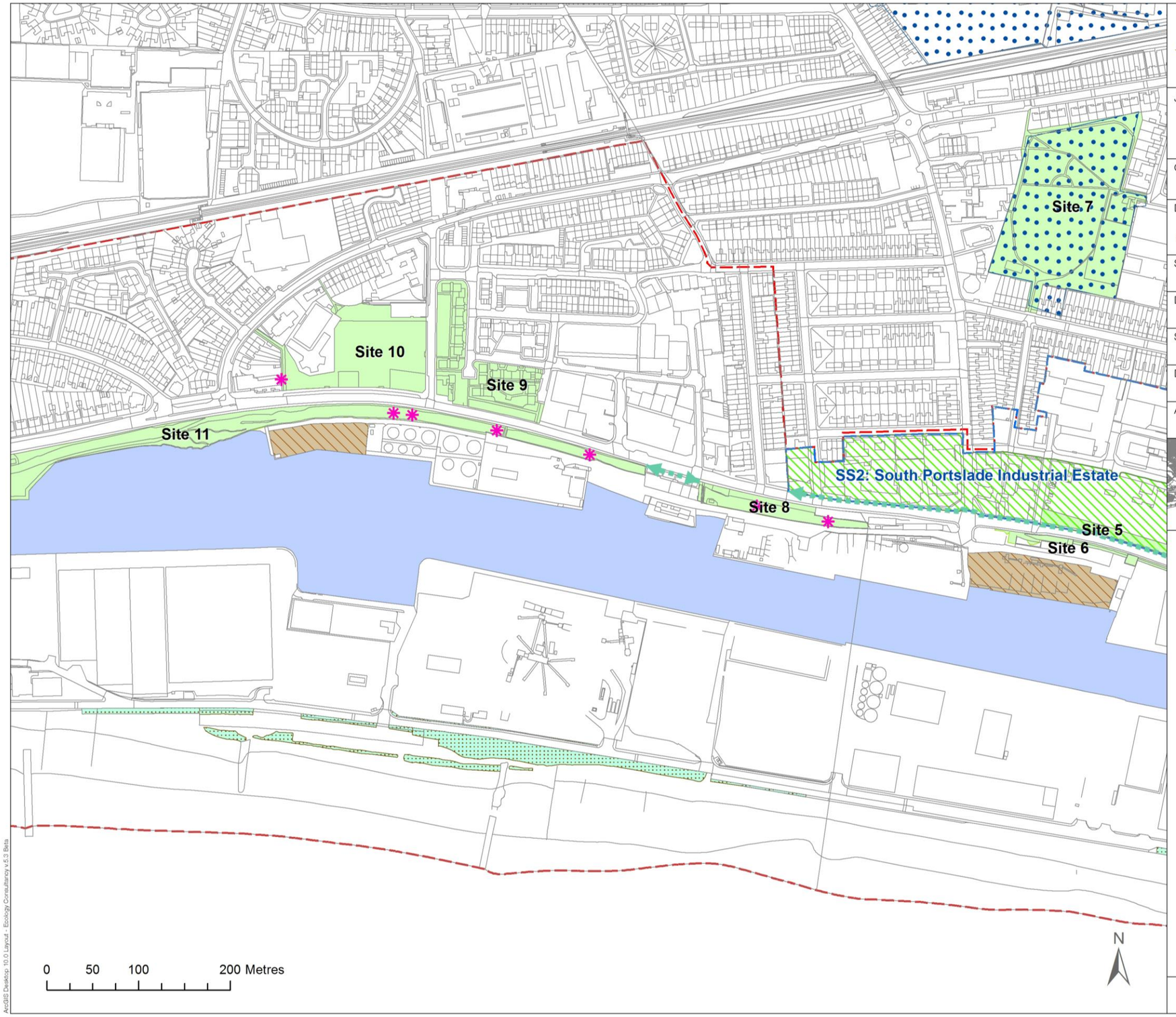
Approved	Date
GC	02/09/2015

KEY

- Shoreham Harbour Regeneration Boundary
- SS1 — Strategic Site Boundary and Number
- Site 1 — Enhancement Site and Number (see Appendix 2 of Ecology Report)
- Site of Special Scientific Interest
- Biodiversity Opportunity Area
- Local Nature Reserve
- Watercourse Pollution Prevention and Control
- Site of Nature Conservation Importance
- Connection to Hove Lagoon
- Saltmarsh
- A259 Streetscape Planting
- Intertidal Mud
- Potential Green Corridor North of A259
- Open Mosaic Habitat
- North - South Green Corridor
- Vegetated Shingle
- Green Roof and Wall Masterplanning
- Invasive Plant Species
- Linear Intertidal Habitat / Vertical Beaches

This plan is provided solely for the purpose of supporting the description of the ecological features of the site as contained in the accompanying report

ArcGIS Desktop 10.0 Layout - Ecology Consultancy v.5.3 Beta



The Ecology Consultancy

Job title
Shoreham Harbour Regeneration
ECL Job no. 3333

Client
Adur District Council

Drawing title
ECOLOGICAL CONSTRAINTS AND OPPORTUNITIES MAP

Section:	Scale (at A3)
B	1:4,000

Date of survey: April 2015

Surveyor: Ben Kimpton

Drawn	Checked
RM	BK

Approved	Date
GC	02/09/2015

KEY

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- SS1 — Strategic Site Boundary and Number
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- Saltmarsh
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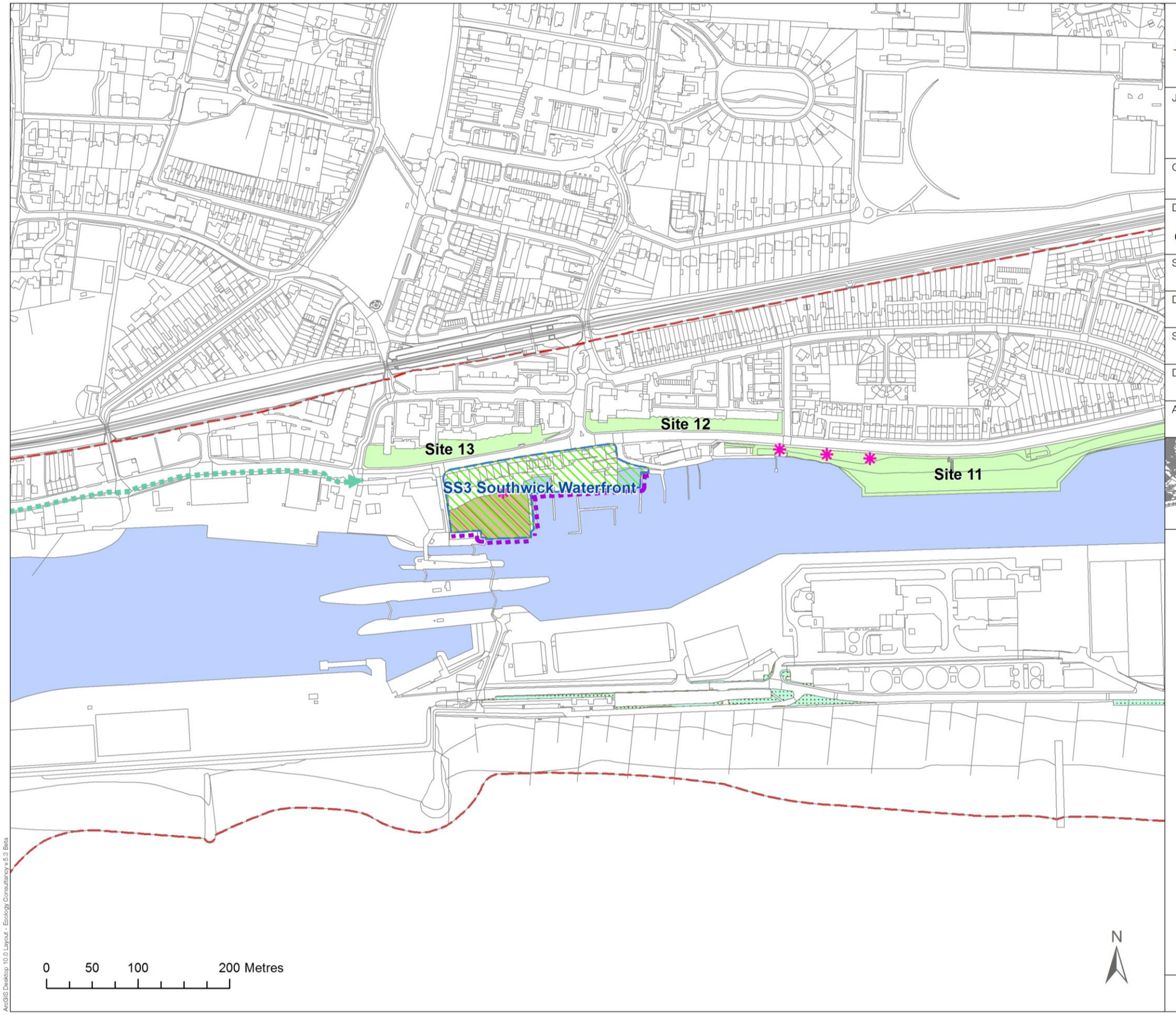

The Ecology Consultancy

Job title
Shoreham Harbour Regeneration
ECL Job no. 3333

Client
Adur District Council

Drawing title
ECOLOGICAL CONSTRAINTS AND OPPORTUNITIES MAP

Section:	Scale (at A3)
C	1:4,000

Date of survey: April 2015

Surveyor: Ben Kimpton

Drawn	Checked
RM	BK

Approved	Date
GC	02/09/2015

KEY

- Shoreham Harbour Regeneration Boundary
- SS1 Strategic Site Boundary and Number
- Site 1 Enhancement Site and Number (see Appendix 2 of Ecology Report)
- Site of Special Scientific Interest
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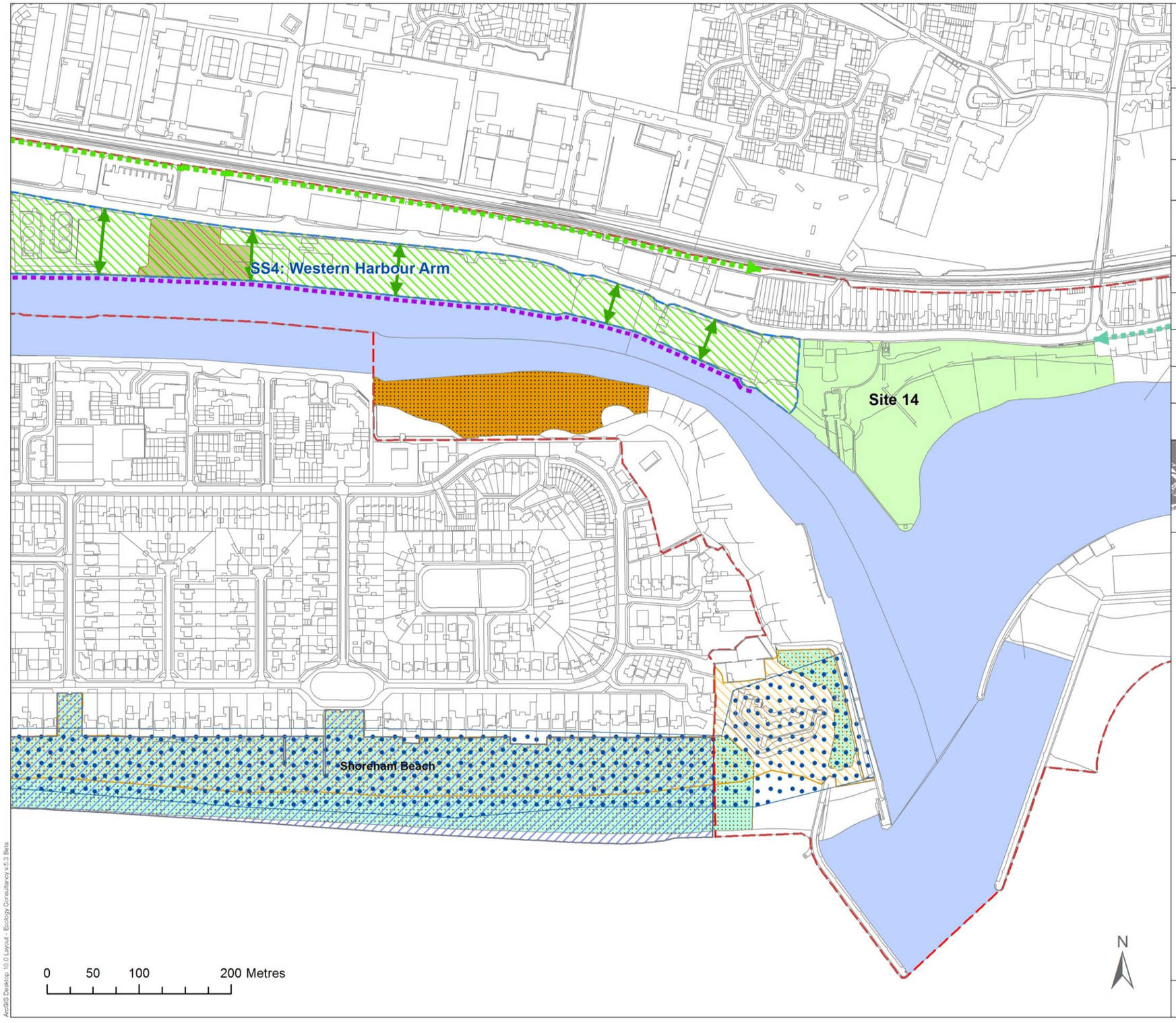
ArcGIS Desktop 10.0 Layout - Ecology Consultancy v 6.3 Beta



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Job title
Shoreham Harbour Regeneration
ECL Job no. 3333

Client
Adur District Council

Drawing title
ECOLOGICAL CONSTRAINTS AND OPPORTUNITIES MAP

Section:	Scale (at A3)
D	1:4,000

Date of survey: April 2015

Surveyor: Ben Kimpton

Drawn	Checked
RM	BK

Approved	Date
GC	02/09/2015

KEY

- Shoreham Harbour Regeneration Boundary
- SS1 — Strategic Site Boundary and Number
- Site 1 — Enhancement Site and Number (see Appendix 2 of Ecology Report)
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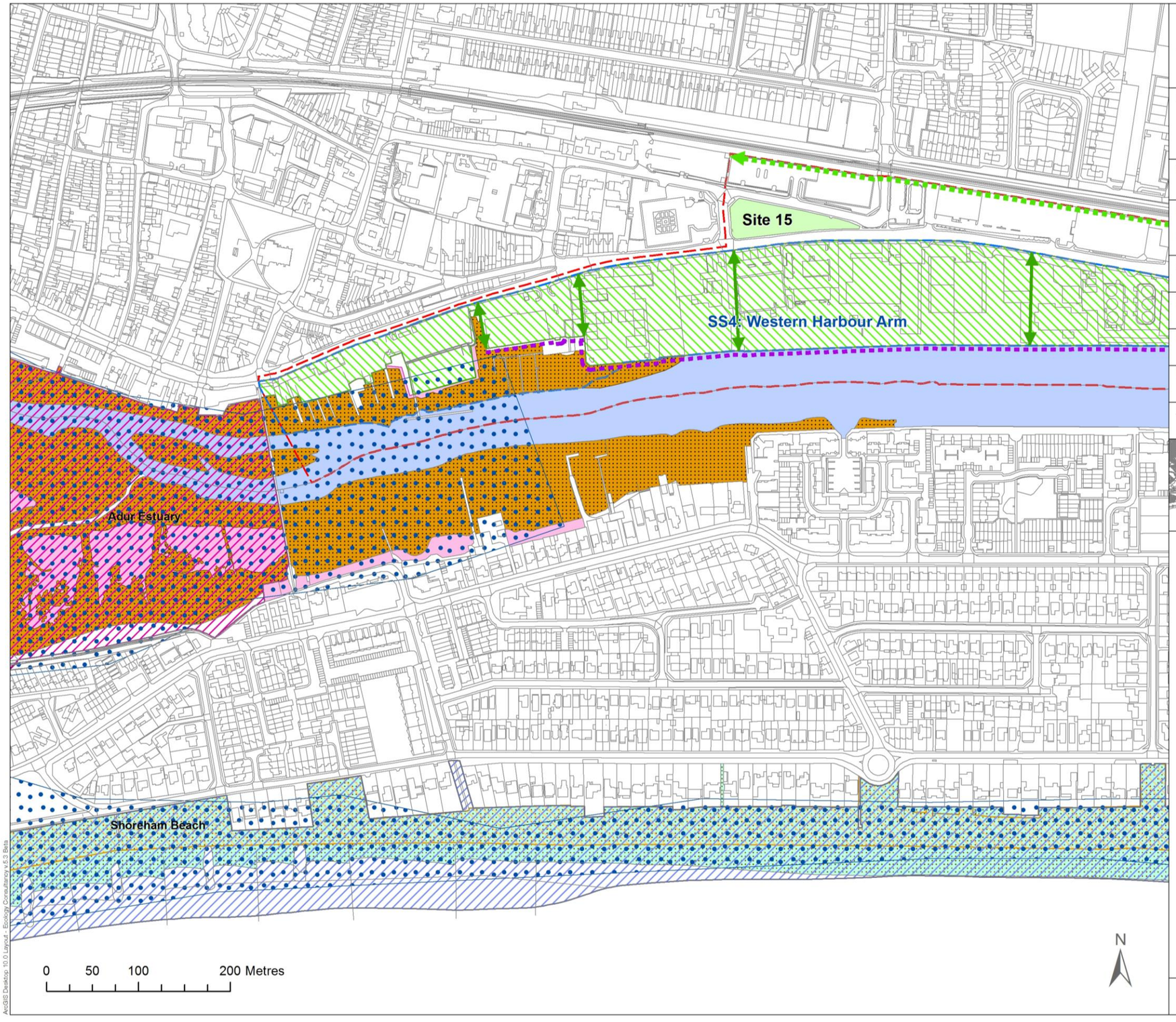
ArcGIS Desktop 10.0 Layout - Ecology Consultancy v.5.3 Beta



The Ecology Consultancy

Job title
Shoreham Harbour Regeneration
ECL Job no. 3333

Client
Adur District Council

Drawing title
ECOLOGICAL CONSTRAINTS AND OPPORTUNITIES MAP

Section:	Scale (at A3)
E	1:4,000

Date of survey: April 2015

Surveyor: Ben Kimpton

Drawn	Checked
RM	BK

Approved	Date
GC	02/09/2015

KEY

- Shoreham Harbour Regeneration Boundary
- Strategic Site Boundary and Number (SS1)
- Enhancement Site and Number (see Appendix 2 of Ecology Report) (Site 1)
- Site of Special Scientific Interest
- Local Nature Reserve
- Site of Nature Conservation Importance
- Saltmarsh
- Intertidal Mud
- Open Mosaic Habitat
- Vegetated Shingle
- Invasive Plant Species
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Appendix 2: Green Infrastructure Site Assessments

Assessment of Green Infrastructure Opportunities at a Site Level

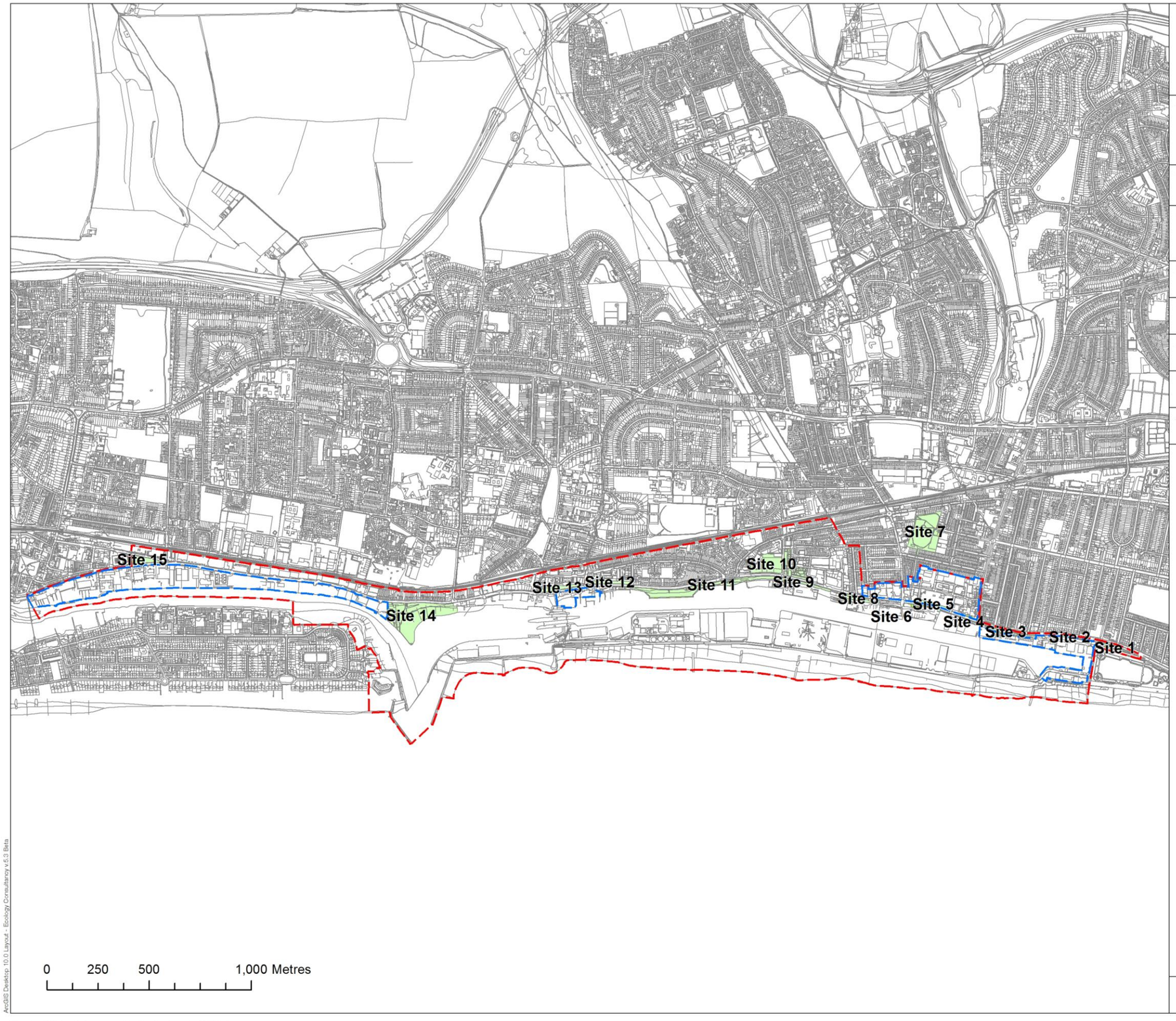
The following Appendix provides an assessment of the potential for Green Infrastructure (GI) opportunities at 15 sites within the Shoreham Harbour Regeneration Area and one site outside of the regeneration area. Only three of these sites fall within the four zones identified for development i.e. strategic sites 1-4 with the intention being to identify ways of improving GI assets across the wider regeneration area over time and connectivity between areas of greenspace.

The 15 sites assessed are shown on the Enhancement Sites Overview Map below and include the following:

Site ID Number	Site Name
1	Wharf Road Embankment
2	Basin Road North Embankment (East) - within strategic site 1
3	Basin Road North Embankment (Central)
4	Frontage To Wellington Road (East) - within strategic site 2
5	Frontage To Wellington Road (West) - within strategic site 2
6	Basin Road North Embankment (West)
7	Vale Park - Outside Regeneration Area
8	Basin Road North Embankment (Cemex)
9	Frontage to Fishersgate Terrace (A259) / West Road
10	Fishersgate Recreation Ground
11	North Canal Bank Below A259
12	Frontage to Rock Close
13	Frontage To Coats Court
14	Kingston Beach
15	The Ham

The findings from the assessment of each site are presented as a summary sheet which includes options for enhancement and management (which where applicable to the site have been struck through). Key options for enhancement and management are also provided as letters (Option A etc.) whose indicative locations are shown on each site's enhancement map.

Note: Recommendations for enhancement and management are outline options only and alternative approaches may be applicable. All habitat creation should follow planning policy relevant to the Shoreham Harbour Regeneration Area as well as best practice guidance on habitat design. Wherever possible species should be native or where non-native species are to be used these should be of recognised wildlife value. All planting schemes should consider the likely coastal conditions.



The Ecology Consultancy

Job title
Shoreham Harbour Regeneration
ECL Job no. 3333

Client
Adur District Council

Drawing title
ENHANCEMENT SITES OVERVIEW MAP

Section:	Scale (at A3)
N/A	1:18,000

Date of survey: April 2015

Surveyor: Ben Kimpton

Drawn	Checked
RM	BK

Approved	Date
GC	09/06/2015

KEY

- Shoreham Harbour Regeneration Boundary
- Strategic Sites Boundary
- Enhancement Sites - see accompanying notes

This plan is provided solely for the purpose of supporting the description of the ecological features of the site as contained in the accompanying report

ArcGIS Desktop 10.0 Layout - Ecology Consultancy v.6.3 Beta

Site Name: **Wharf Road Embankment**		
Site ID Number: **1**	Date: 21.04.15	Size (ha): 0.16
Site Location: Situated between Wharf Road and Kingsway (A259), north of Hove Lagoon in Brighton and Hove. Adjacent to strategic site 1: Aldrington Basin.		
Evidence of Management: ~~Yes~~ / No		
Site Condition: Good / ~~Moderate~~ / Poor		

Access: private / ~~public (free)~~ / ~~defacto (unofficial)~~ / restricted / disabled / none

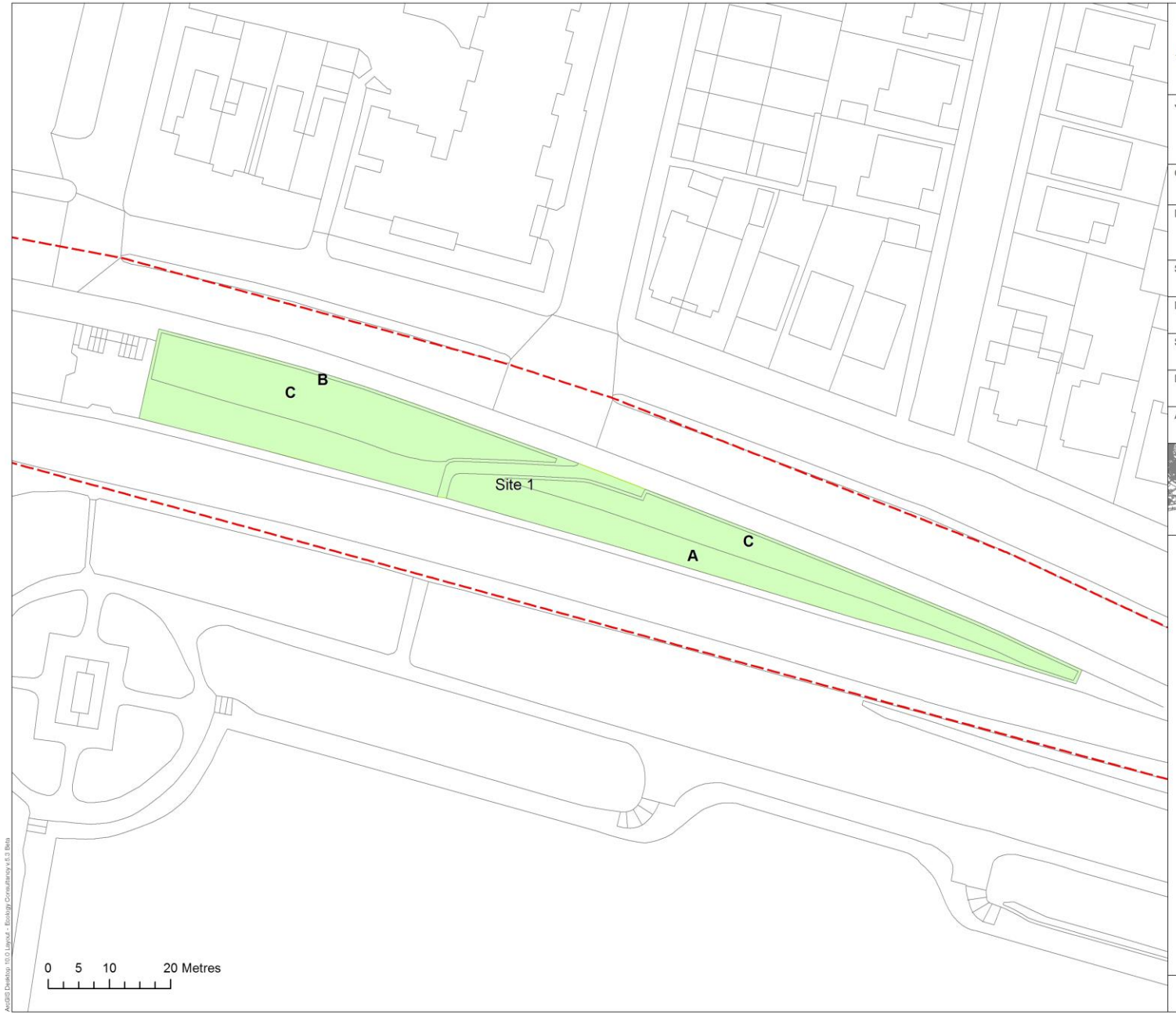
Site Description: South facing bank dominated by species-poor semi-improved grassland (c.95%) with some tall-ruderal plants such as salsify *Tragopogon porrifolius*. The nationally scarce plant - toothed medick *Medicago polymorpha* has been recorded here. Chalk piles had been put along the southern boundary in the eastern half of the site as habitat for butterflies. These will be sown in May 2015, but in the interim have become sparsely vegetated with self-established plants including abundant groundsel *Senecio vulgaris*, frequent rape *Brassica napus* and Virginia stock *Malcomia maritime.* Cornflower *Centaurea cyanus*, sweet Alison *Lobularia maritima*, candytuft *Iberis sp.*, black mustard *Brassica nigra*, scorpion flower *Phacelia tanacetifolia*, borage *Borago officinalis*, oriental rocket *Sisymbrium orientale* and bread wheat *Triticum aestivum* were also present. Site exposed to coastal wind and noise and air pollution from Kingsway and Wharf Road.

Key Opportunities For Enhancement:

Retrofit green roofs – intensive / semi-intensive / extensive	
Woody planting – trees / scrub / ~~hedgerows~~ along top of bank (Option B)	✓
Landscape planting - sustainable/perennial planting / extend seasonal interest / floristic annual display / other	
Food production - fruit trees / edible hedgerow / vegetables	
Grassland – wildflower meadow / daisy lawn / ~~plug-planting~~ / bulb planting / management change / other	✓
SuDS – pond / rain garden / swale / filter-strip / diverted down-pipe planter / underground tank / other	
Green wall – climber / modular	
Bespoke invertebrate habitat – ~~log-piles~~ / ~~bee-hotels~~ / ~~hibernacula~~ ideally positioned close to the butterfly bank	✓
Bird boxes	
Bat boxes	
Window boxes / raised planters	
Other	

Barriers:		Isolated - green island	✓	Size – small etc.	✓	Underground services	✓	Buildings/structures	✓
Access/transport infrastructure		User level – high low	?	Low visibility		Maintenance		Multiple ownership	

Notes: Efforts should be concentrated on creating and maintaining the proposed butterfly bank (Option A) and enhancing the grassland surrounding the bank as supporting foraging habitat. As the bank is dominated by coarse grass species, the plug-planting of taller/bulkier wildflowers is advised (Option C). Suitable species include vetches *Vicia sativa* / *V. cracca*, knapweeds *Centaurea nigra* / *C. scabiosa*, campions *Silene dioica* / *S. latifolia*, agrimony *Agrimonia eupatoria*, wild mignonette *Reseda lutea*, wild parsnip *Pastinaca sativa*, great mullein *Verbascum thapsus* etc. The use of yellow rattle *Rhinanthus minor* (which is parasitic on grasses and reduces their vigour) could also be considered. Grassland would benefit from at least an annual cut (in autumn) with arisings removed to gradually reduce nutrient level to the benefit of wildflower species. The planting of a species-rich native hedgerow along the top of the bank could also be considered providing it can be maintained long-term.



The Ecology Consultancy

Job title
Shoreham Harbour Regeneration
ECL Job no. 3333

Client
Adur District Council

Drawing title
ENHANCEMENT SITES MAP

Section:	Scale (at A3)
Site 1	1:600

Date of survey: April 2015

Surveyor: Ben Kimpton

Drawn	Checked
RM	BK

Approved	Date
GC	01/05/2015

KEY

- Shoreham Harbour Regeneration Boundary
- Strategic Sites Boundary
- A — Enhancement Sites and options - see accompanying notes

N

This plan is provided solely for the purpose of supporting the description of the ecological features of the site as contained in the accompanying report

ArcGIS Desktop 10.0 Layout - Ecology Consultancy v 6.3 Beta

Site Name: **Basin Road North Embankment (East)**		
Site ID Number: **2**	Date: 21.04.15	Size (ha): 0.09
Site Location: between Kingsway (A259) and industrial buildings within strategic site 1: Aldrington Basin in Brighton and Hove. Runs between Blue Lagoon Bar and Pets Corner.		
Evidence of Management: Yes / ~~No~~		
Site Condition: Good / Moderate / ~~Poor~~		

Access: private / public (free) / defacto (unofficial) / ~~restricted~~ / disabled / ~~none~~

Site Description:

Steep south facing bank dominated by species-poor semi-improved grassland (c.95%) and scattered scrub (c.5%). Site quite exposed to coastal wind and noise and air pollution from Kingsway.

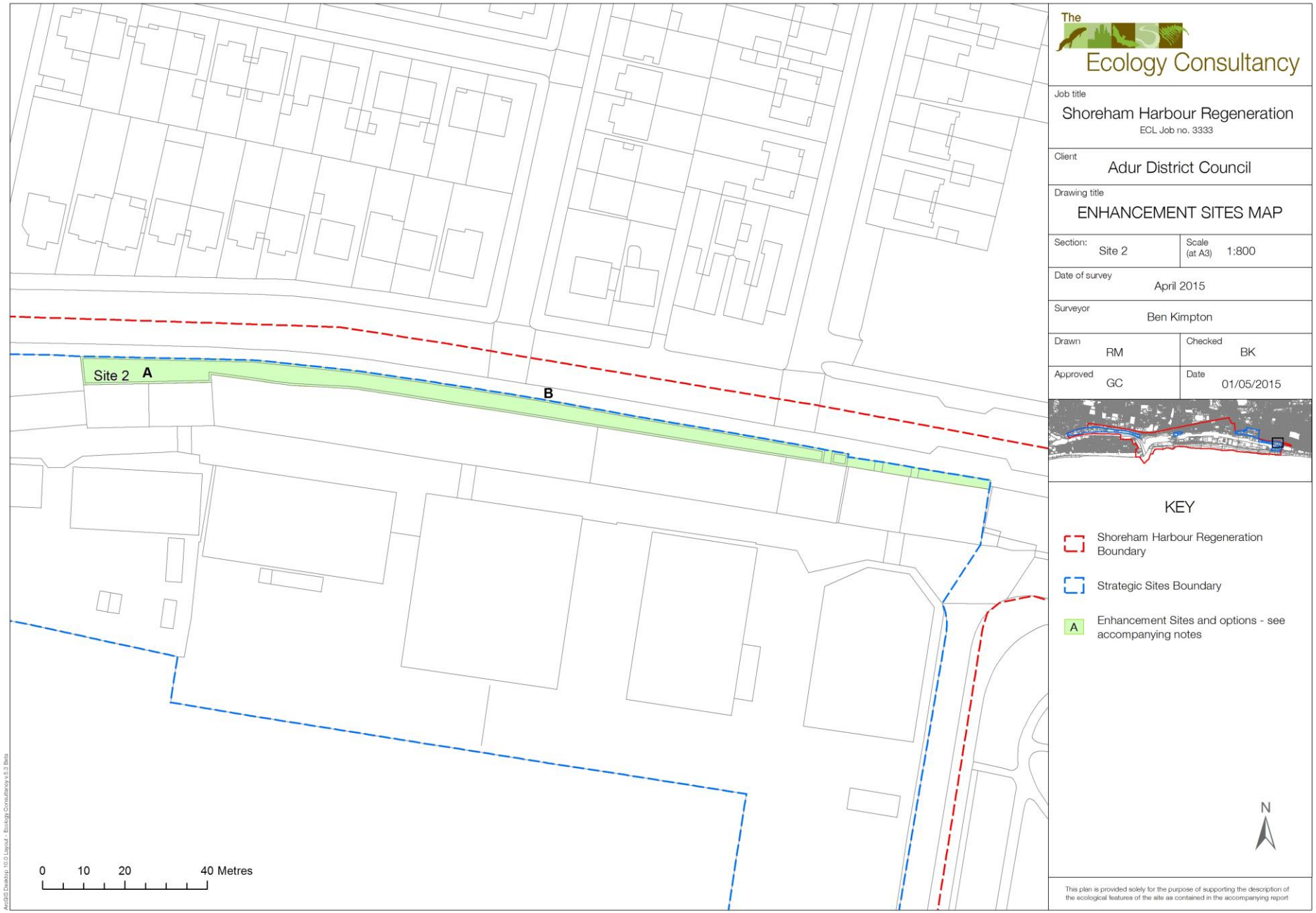
Key Opportunities For Enhancement:

Retrofit green roofs – intensive / semi-intensive / extensive	
Woody planting – trees / ~~scrub pockets~~ / hedgerows – at western end (Option A)	✓
Landscape planting - sustainable/perennial planting / extend seasonal interest / floristic annual display / other	
Food production - fruit trees / edible hedgerow / vegetables	
Grassland – wildflower meadow / daisy lawn / plug-planting / bulb planting / management change / other	
SuDS – pond / rain garden / swale / filter-strip / diverted down-pipe planter / underground tank / other	
Green wall – ~~climber~~ / modular – climbing plants along top of bank (Option B)	✓
Bespoke invertebrate habitat – log-piles / bee-hotels / hibernacula	
Bird boxes	
Bat boxes	
Window boxes / raised planters	
Other	

Barriers:		Isolated - green island	✓	Size – small etc.	✓	Underground services		Buildings/structures	
~~Access~~/transport infrastructure	✓	User level – high ~~low~~	✓	Low visibility	✓	Maintenance	✓	Multiple ownership	

Notes:

Not visible by general public except at top of bank where site borders pavement. Greatest potential therefore is for planting of climbing plants (Option B) along top of bank (which may require an additional support structure to climb on) and/or planting of dense scrub at western end of site (Option A) to benefit nesting birds. High levels of rubbish at bottom of bank should be cleared.


Site 2
A
B
0
10
20
40 Metres
N
The Ecology Consultancy
Job title
Shoreham Harbour Regeneration
ECL Job no. 3333
Client
Adur District Council
Drawing title
ENHANCEMENT SITES MAP
Section: Site 2
Scale (at A3) 1:800
Date of survey
April 2015
Surveyor
Ben Kimpton
Drawn
RM
Checked
BK
Approved
GC
Date
01/05/2015
KEY
Shoreham Harbour Regeneration Boundary
Strategic Sites Boundary
A
Enhancement Sites and options - see accompanying notes
This plan is provided solely for the purpose of supporting the description of the ecological features of the site as contained in the accompanying report
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Site Name: **Basin Road North Embankment (Central)**		
Site ID Number: **3**	Date: 27.04.15	Size (ha): 0.21
Site Location: between Brighton Road (A259) and Basin Road North in Brighton and Hove. Adjacent to strategic site 1: Aldrington Basin.		
Evidence of Management: ~~Yes~~ / No		
Site Condition: Good / ~~Moderate~~ / Poor		

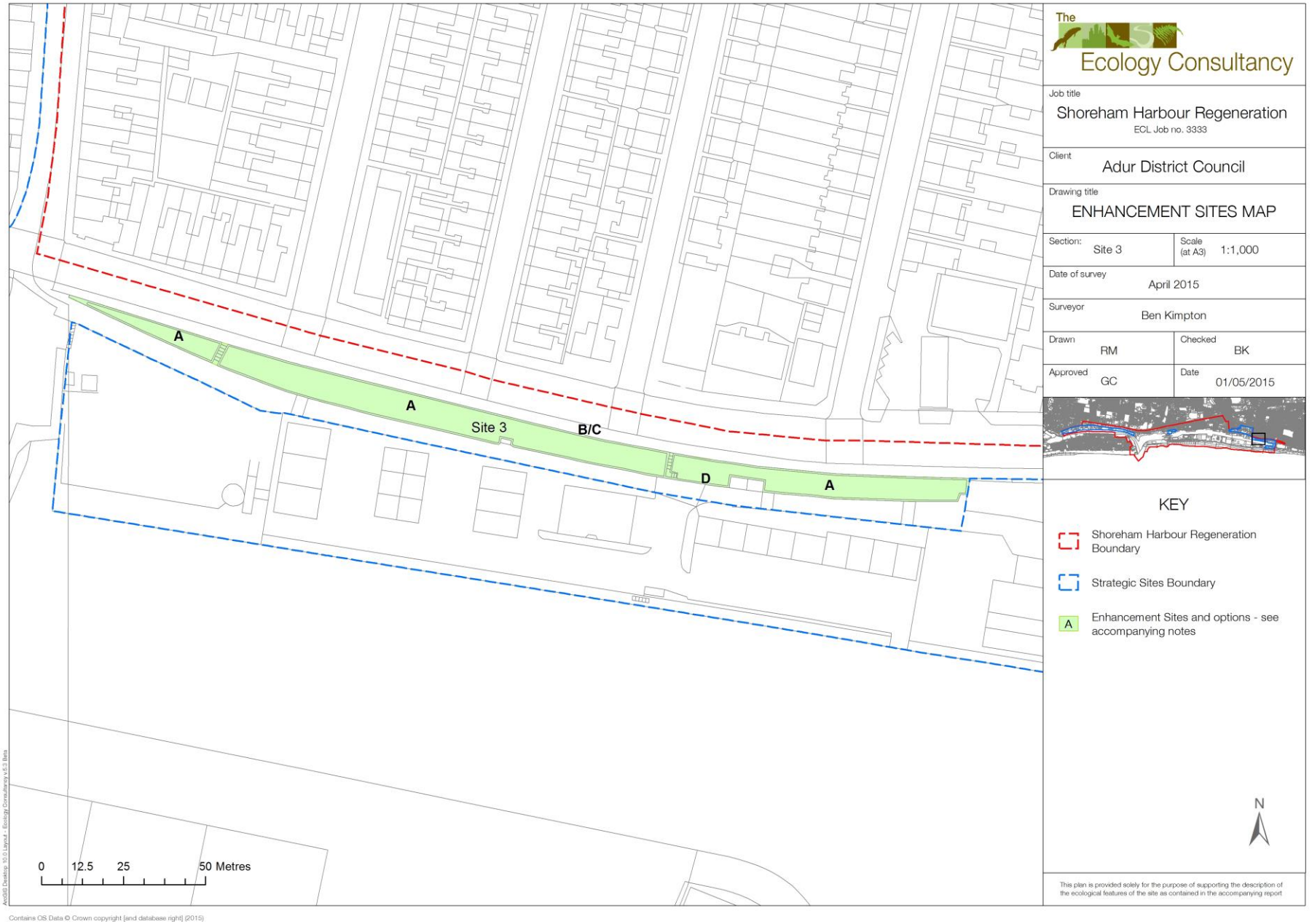
Access: private / public (free) / ~~defacto (unofficial)~~ / ~~restricted~~ / disabled / none

Site Description: Steep south facing bank dominated by species-poor semi-improved grassland (c.90%) and scrub (c.10%). Two sets of publicly accessible stairs are present. Clumps of a number of self-established native and non-native plant species are present including daffodil *Narcissus pseudonarcissus* cv., spring snowflake *Leucojum vernum*, Spanish bluebell *Hyacinthoides hispanica*, snow-in-summer *Cerastium tomentosum* and wall cotoneaster *Cotoneaster horizontalis*. Some tree planting (field maples *Acer campestre* etc.) has taken place on the lower bank at the eastern end. Site exposed to coastal wind and noise and air pollution from Brighton Road and Basin Road North. A reptile survey of this site was carried out in 2009 (Halcrow, 2009d), but no reptile species were recorded.

Key Opportunities For Enhancement:	
Retrofit green roofs – intensive / semi-intensive / extensive	
Woody planting – trees / ~~scrub~~ / ~~hedgerows~~	✓
Landscape planting - ~~sustainable/perennial planting~~ / extend seasonal interest / floristic annual display / other	✓
Food production - fruit trees / edible hedgerow / vegetables	
Grassland – wildflower meadow / daisy lawn / ~~plug-planting~~ / bulb planting / ~~management change~~ / other	✓
SuDS – pond / rain garden / swale / filter-strip / diverted down-pipe planter / underground tank / other	
Green wall – ~~climber~~ / modular	✓
Bespoke invertebrate habitat – ~~log-piles~~ / bee-hotels / ~~hibernacula~~	✓
Bird boxes	
Bat boxes	
Window boxes / raised planters	
Other	

Barriers:		Isolated - green island	✓	Size – small etc.		Underground services		Buildings/structures	✓
Access/transport infrastructure		User level – high low		Low visibility		Maintenance	✓	Multiple ownership	

Notes: Grassland could be enhanced to increase wildflower diversity, primarily by plug-planting of taller/bulkier wildflowers (Option A) and/or the sowing of yellow rattle *Rhinanthus minor*. Suitable species for plug-planting include vetches *Vicia sativa* / *V. cracca*, knapweeds *Centaurea nigra* / *C. scabiosa*, campions *Silene dioica* / *S. latifolia*, agrimony *Agrimonia eupatoria*, wild mignonette *Reseda lutea*, wild parsnip *Pastinaca sativa*, great mullein *Verbascum thapsus* etc. Yellow rattle is parasitic on grasses and would reduce their vigour to the benefit of wildflowers. Grassland would also benefit from at least an annual cut (in autumn) with arisings removed to gradually reduce nutrient level. The planting of a species-rich native hedgerow (Option B) or climbers (Option C) along the top of the bank could also be considered providing it can be maintained long-term. Wall Cotoneaster is an invasive plant species listed under Schedule 9 of the Wildlife and Countryside Act 1981 (as amended) and any future works that could potentially cause its spread should be avoided (Option D) or correctly mitigated for if works are unavoidable.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The Ecology Consultancy
Job title
Shoreham Harbour Regeneration
ECL Job no. 3333
Client
Adur District Council
Drawing title
ENHANCEMENT SITES MAP
Section: Site 3
Scale (at A3) 1:1,000
Date of survey
April 2015
Surveyor
Ben Kimpton
Drawn RM
Checked BK
Approved GC
Date 01/05/2015
KEY
Shoreham Harbour Regeneration Boundary
Strategic Sites Boundary
A
Enhancement Sites and options - see accompanying notes
N
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Site Name: **Frontage To Wellington Road (East)**		
Site ID Number: **4**	Date: 27.04.15	Size (ha): 0.04
Site Location: adjacent to Wellington Road (A259) between Boundary Road and Camden Street in Brighton and Hove. Within strategic site 2: South Portslade.		
Evidence of Management: ~~Yes~~ / No		
Site Condition: Good / ~~Moderate~~ / Poor		

Access: private / public (free) / ~~defacto (unofficial)~~ / restricted / disabled / none

Site Description: Roadside space between pavement and adjacent property (1 Wellington Road) dominated by species-poor semi-improved grassland (c.90%) with mature shrub planting (c.10%). Part of the site is currently used as storage compound for an adjacent development. Small area of planting (raised bed) near to bus shelter is well managed. Site exposed to coastal wind and noise and air pollution from Wellington Road.

Key Opportunities For Enhancement:

Retrofit green roofs – intensive / semi-intensive / extensive	
Woody planting – ~~trees~~ / scrub / ~~hedgerows~~	✓
Landscape planting - ~~sustainable/perennial planting~~ / extend seasonal interest / floristic annual display / other	✓
Food production - fruit trees / edible hedgerow / vegetables	
Grassland – ~~wildflower meadow~~ / daisy lawn / ~~plug-planting~~ / ~~bulb planting~~ / management change / other	✓
SuDS – pond / ~~rain garden~~ / ~~swale~~ / filter-strip / ~~diverted down-pipe~~ planter / underground tank / other	✓
Green wall – ~~climber~~ / modular	✓
Bespoke invertebrate habitat – log-piles / bee-hotels / hibernacula	
~~Bird boxes~~	✓
Bat boxes	
Window boxes / raised planters	
Other	

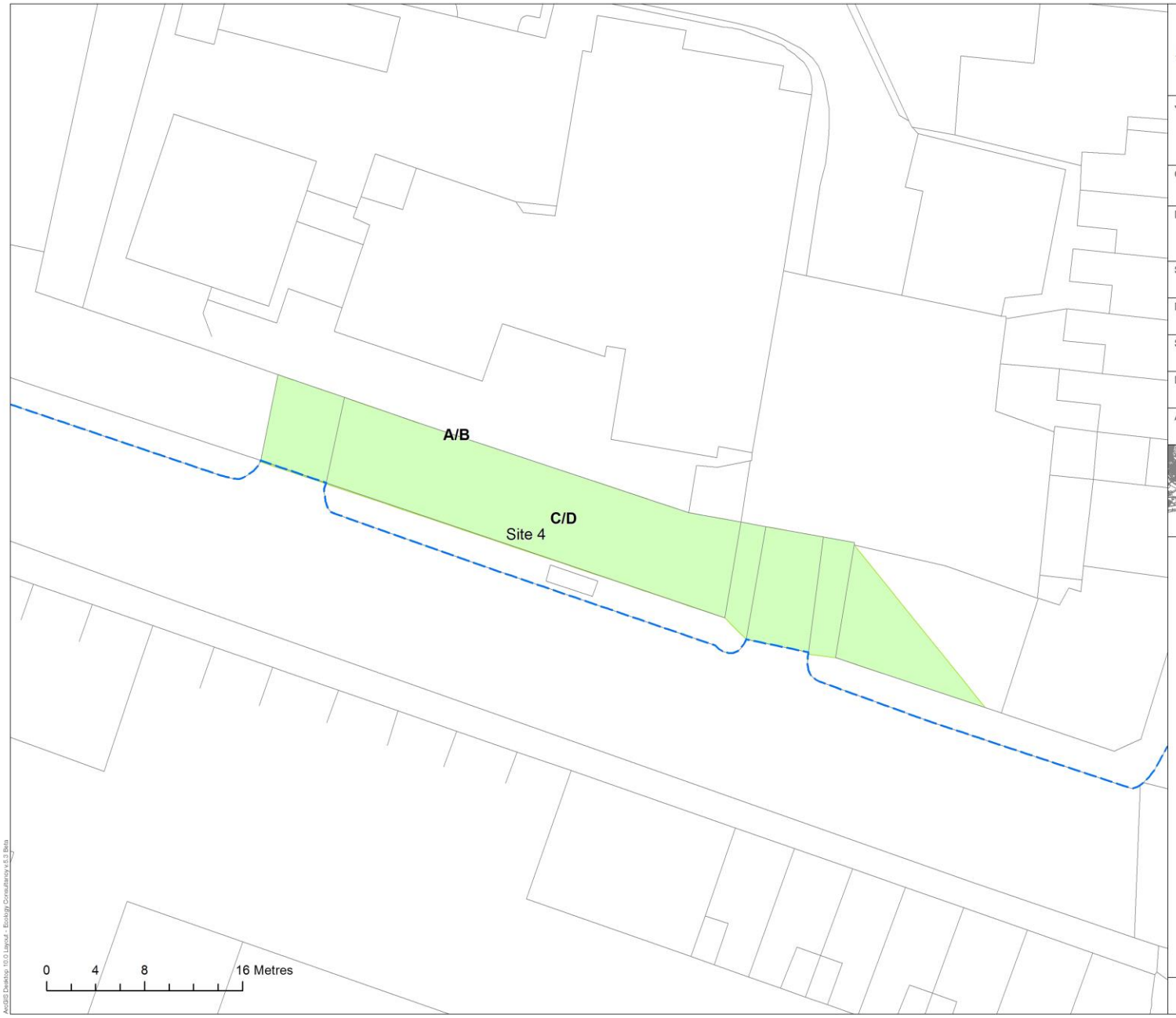
Barriers:		Isolated - green island	✓	Size – small etc.	✓	Underground services	✓	Buildings/structures	
Access/transport infrastructure		User level – high low		Low visibility		Maintenance	✓	Multiple ownership	?

Notes:

Greatest potential exists with enhancing the area of grassland, either through creating a new wildflower meadow or plug-planting wildflowers and bulbs (Option C). If a new wildflower meadow is to be created it would require the cutting and removal of arisings at least twice per annum to maintain a diverse sward long-term. Existing shrub planting (Japanese spindle *Euonymus japonicus*) could be pruned into a dense hedge to further benefit nesting birds that are using it. The western end of the northern boundary (fence) could also be planted with more Japanese spindle to create continuous woody habitat and a screen (Option A) or climbers could be used (Option B).

The site has potential for SuDS as either a rain garden or swale (Option D), but this would require capture of roof rain water from adjacent property. Surface water from the adjacent pavement could also be diverted into the SuDS feature if the camber of the pavement can be changed to angle towards the site, instead of into the road.

The adjacent site to the north (Belgrave Day Centre) is proposed for redevelopment which potentially increases both the variety and extent of enhancement options, particularly if green roofs are to be used. These could intercept rain water at source and feed water into any proposed SuDS scheme as part of a series of treatments.



The Ecology Consultancy

Job title
Shoreham Harbour Regeneration
ECL Job no. 3333

Client
Adur District Council

Drawing title
ENHANCEMENT SITES MAP

Section:	Site 4	Scale (at A3)	1:300
Date of survey	April 2015		
Surveyor	Ben Kimpton		
Drawn	RM	Checked	BK
Approved	GC	Date	01/05/2015

KEY

- Shoreham Harbour Regeneration Boundary
- Strategic Sites Boundary
- A — Enhancement Sites and options - see accompanying notes

N

This plan is provided solely for the purpose of supporting the description of the ecological features of the site as contained in the accompanying report

Site Name: **Frontage To Wellington Road (West)**		
Site ID Number: **5**	Date: 27.04.15	Size (ha): 0.16
Site Location: greenspace fronting Wellington Road (A259) between Camden Street and Middle Street in Brighton and Hove. Within strategic site 2: South Portslade.		
Evidence of Management: ~~Yes~~ / No		
Site Condition: Good / Moderate / ~~Poor~~		

Access: private / public (free) / ~~defacto (unofficial)~~ / restricted / disabled / none

Site Description: Large area of species-poor semi-improved and amenity grassland (c.90%) in front of industrial buildings (Denmay Steel & Hire and Flexer Sacks). Group of scattered trees and scrub at the western end and a small private garden with vegetable patch at eastern end - which is part of Harbour View Public House. An area in front of the derelict Flexer Sacks building is boarded off for reasons of health and safety. Two billboards are also present. Site exposed to coastal wind and noise and air pollution from Wellington Road.

Key Opportunities For Enhancement:	
Retrofit green roofs – intensive / semi-intensive / extensive	
Woody planting – ~~trees~~ / ~~scrub~~ / ~~hedgerows~~	✓
Landscape planting - ~~sustainable/perennial planting~~ / extend seasonal interest / floristic annual display / other	
Food production - fruit trees / edible hedgerow / vegetables	
Grassland – ~~wildflower meadow~~ /~~ daisy lawn~~ /~~ plug planting~~ /~~ bulb planting~~ /~~ management change~~ / other	✓
SuDS – pond / ~~rain garden~~ / ~~swale~~ / filter-strip / ~~diverted down-pipe~~ planter / underground tank / other	✓
Green wall – climber / modular	
Bespoke invertebrate habitat – ~~log-piles~~ / bee-hotels / hibernacula – under/around group of scrub and trees	✓
Bird boxes	
Bat boxes	
Window boxes / raised planters	
Other	

Barriers:		Isolated - green island	✓	Size – small etc.		Underground services	?	Buildings/structures	✓
Access/transport infrastructure		User level – high low		Low visibility		Maintenance	✓	Multiple ownership	

Notes:

Provides a relatively large area of greenspace adjacent to a busy road (A259) that could be easily enhanced for biodiversity, visual amenity and storm water attenuation benefits. An approximate 1m wide section along the entire southern edge of the grassland could be turned into a wildflower meadow/strip (Option A), which would require the cutting and removal of arisings at least twice per annum to maintain the diversity of the sward. The trees/scrub at the western end has value as breeding bird habitat, but it does require management (reduction of bramble, pruning, rubbish removal etc.). There is sufficient space at the western end for the additional planting of native scrub species and/or non-native species of recognised value to wildlife (Option B).

Should the adjacent buildings be redeveloped there is potential to use the site for SuDS including rain gardens and/or swales (Option C) that would receive rainwater captured from adjacent buildings and hard surfacing.

Dumped rubbish at western end should be cleared, along with parked vehicles where possible.

Site Name: **Basin Road North Embankment (West)**		
Site ID Number: **6**	Date: 27.04.15	Size (ha): 0.12
Site Location: south of Wellington Road (A259) between Cemex Brighton Plant and Wharf and Travis Perkins in Brighton and Hove. Adjacent to strategic site 2: South Portslade.		
Evidence of Management: Yes / ~~No~~		
Site Condition: Good / ~~Moderate~~ / Poor		

Access: private / public (free) / defacto (unofficial) / restricted / disabled / ~~none~~

Site Description: South facing bank with series of retaining walls with two vegetated terraces. Dominated by species-poor semi-improved grassland (c.95%) with some self-established scrub (c.5%) including ivy *Hedera helix* and garden privet *Ligustrum ovalifolium*. One area of the upper bank at the western end of the site (behind the bus shelter) was more diverse with common vetch *Vicia sativa* and common knapweed *Centaurea nigra* present. Site quite exposed to coastal wind and noise and air pollution from Wellington Road and Basin Road North.

Key Opportunities For Enhancement:

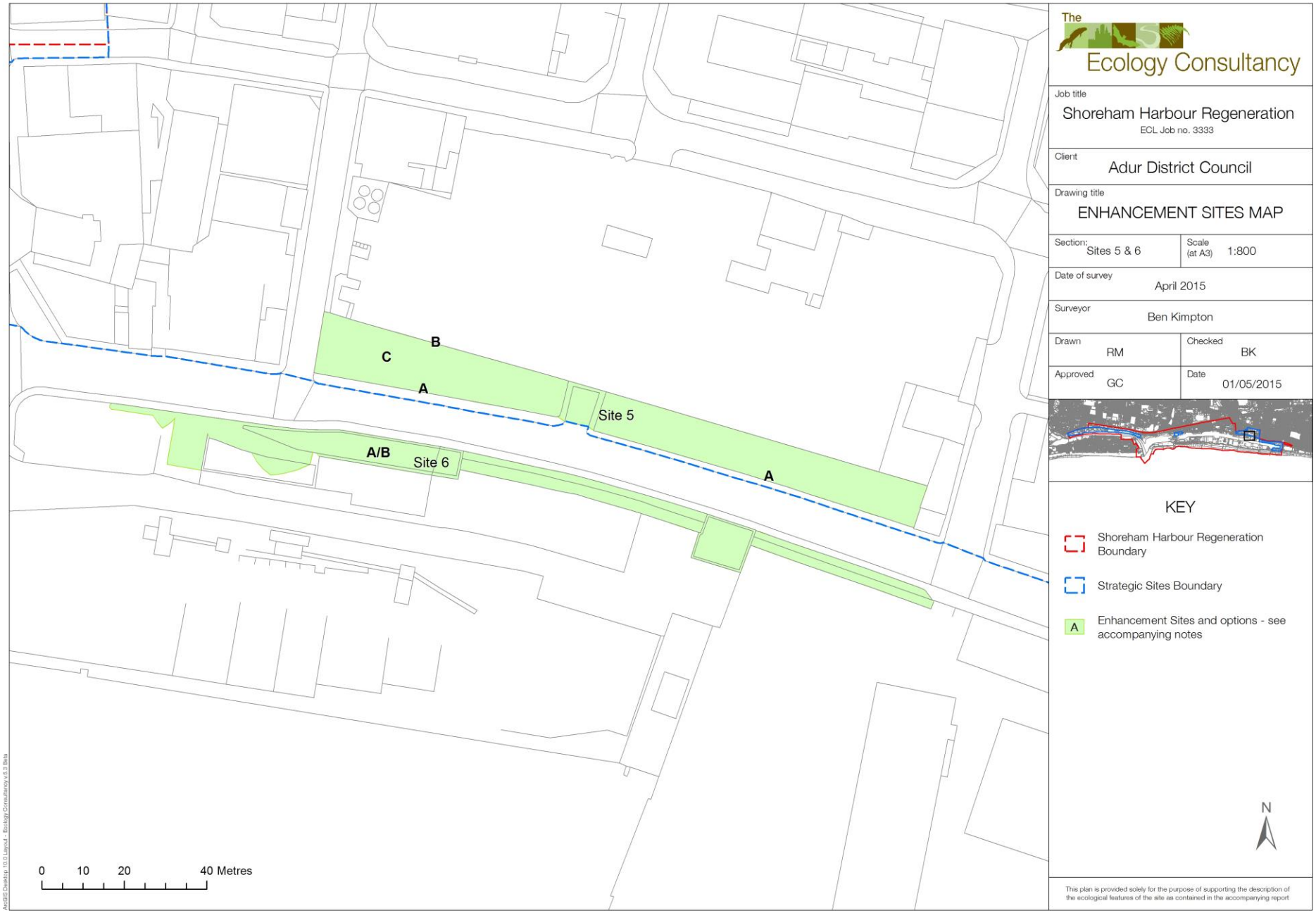
Retrofit green roofs – intensive / semi-intensive / extensive	
Woody planting – trees / ~~scrub~~ / hedgerows (Option B)	✓
Landscape planting – sustainable/perennial planting / extend seasonal interest / floristic annual display / other	
Food production – fruit trees / edible hedgerow / vegetables	
Grassland – wildflower meadow / daisy lawn / ~~plug-planting~~ / ~~bulb planting~~ / ~~management change~~ / other (Option A)	✓
SuDS – pond / rain garden / swale / filter-strip / diverted down-pipe planter / underground tank / other	
Green wall – ~~climber~~ / modular	
Bespoke invertebrate habitat – ~~log-piles~~ / ~~bee-hotels~~ / ~~mixed piles of substrates~~ / hibernacula	✓
~~Bird boxes~~ - would require cover from wind/rain/sun. Back of existing buildings most suitable location.	
Bat boxes	
Window boxes / raised planters	
Other	

Barriers:		Isolated - green island	✓	Size – small etc.	✓	Underground services		Buildings/structures	✓
Access/transport infrastructure		User level – high low		Low visibility	✓	Maintenance		Multiple ownership	

Notes:

Opportunities for enhancement are limited due to size and access. The number of wildflowers could be increased by plug-planting taller/bulkier wildflowers (Option B) such as vetches *Vicia sativa* / *V. cracca*, knapweeds *Centaurea nigra* / *C. scabiosa*, campions *Silene dioica* / *S. latifolia*, agrimony *Agrimonia eupatoria*, wild mignonette *Reseda lutea*, wild parsnip *Pastinaca sativa*, great mullein *Verbascum thapsus* etc. Introducing yellow rattle *Rhinanthus minor* (which is parasitic on grasses and reduces their vigour) should also be considered alongside plug-planting. Additional scrub planting to benefit nesting birds (Option B) would be best at the western end of the site, but should not shade or be allowed to spread into grassland that is more botanically diverse.

The south facing walls and terraces could be good locations for bespoke invertebrate habitat, but exposure to elements is likely to reduce their use. Adding substrate piles (such as sands/gravels/chalk) to the terraces could also be considered providing it does not pose a health and safety risk.


B
C
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Site 5
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Site 6
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40 Metres
The Ecology Consultancy
Job title
Shoreham Harbour Regeneration
ECL Job no. 3333
Client
Adur District Council
Drawing title
ENHANCEMENT SITES MAP
Section: Sites 5 & 6
Scale (at A3) 1:800
Date of survey
April 2015
Surveyor
Ben Kimpton
Drawn
RM
Checked
BK
Approved
GC
Date
01/05/2015
KEY
Shoreham Harbour Regeneration Boundary
Strategic Sites Boundary
A
Enhancement Sites and options - see accompanying notes
N
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Site Name: **Vale Park**		
Site ID Number: **7**	Date: 21.04.15	Size (ha): 2.43
Site Location: located centrally within the block delimited by Vale Road (to the north), Denmark Road/Norway Street (to the east), St. Andrew's Road (to the south) and Church Road (to the west), in south Portslade, Brighton and Hove. Surrounded by a mixture of residential, industrial, public/educational buildings along all boundaries, including Portslade Health Centre (who use the park) and St. Mary's Catholic Primary School. Multiple access points into the park with the main entrance and car parking on the east side via Franklin Road.		
Evidence of Management: ~~Yes~~ / No		
Site Condition: Good / ~~Moderate~~ / Poor		

Access: private / ~~public (free)~~ / defacto (unofficial) / restricted / disabled / none

Site Description: A typical small-medium sized urban park dominated by amenity grassland (c.75%), but with an area of broad-leaved semi-natural woodland (c.15%). Beds planted with horticultural plants, scattered trees/scrub, buildings (including Scout Hut and toilets) and hard-standing make up the remaining 10% of area. A playground is present in the south-east corner of the site.

Key Opportunities For Enhancement:

Retrofit green roofs – intensive / ~~semi-intensive / extensive~~	✓
Woody planting – ~~trees~~ / ~~scrub~~ / ~~hedgerows~~	✓
Landscape planting - ~~sustainable/perennial planting~~ / extend seasonal interest / floristic annual display / other	✓
Food production - ~~fruit trees / edible hedgerow / vegetables~~	✓
Grassland – ~~wildflower meadow / daisy lawn / plug-planting / bulb planting / management change~~ / other	✓
SuDS – ~~pond / rain garden / swale / filter-strip / diverted down-pipe planter / underground tank~~ / other	✓
Green wall – ~~climber~~ / modular	✓
Bespoke invertebrate habitat – ~~log-piles / bee-hotels / hibernacula~~	✓
~~Bird boxes~~	✓
~~Bat boxes~~ - the use of the Park by bats should be determined beforehand	✓
Window boxes / raised planters	
~~Other~~ – composting facilities	✓

Barriers:		Isolated - green island		Size – small etc.		Underground services		Buildings/structures	
Access/transport infrastructure		User level – ~~high~~ low	✓	Low visibility		Maintenance	✓	Multiple ownership	

Notes:

Form part of the Brighton and Hove Urban Green Network Biodiversity Opportunity Area (BOA). Opportunities identified for this BOA that are relevant to the site include; education and community engagement; urban biodiversity and opportunities associated with adjacent development. Potential for a variety of enhancements measures which will benefit a wide range of users and the BOA. The site has been previously identified as a location for SuDS in the following study Portslade Sustainable Drainage Scheme (SuDS) Feasibility Study. In addition to the findings of this report the toilet block is suitable for a retrofitted green roof, rain garden planter (Option A) and the adjacent car park and grass verges suitable for permeable paving, filter strips and rain gardens (Option B). Given the use of the site by the local community which may include the primary school, features such as log piles (Option C) and 'bug mansions/bee hotels' (Option D) would benefit wildlife as well as providing potential educational resources. The metal railings around the playground could be replaced with a native species-rich hedgerow (Option E). The ground flora within the woodland is relatively impoverished and would benefit from the planting of native bulbs and other woodland plants (Option F). Whilst the structure of the woodland's shrub layer is very good, sycamore can become invasive at the expense of native species

and therefore it is recommended that it be removed (Option G). Wildflower meadow/strips could be created on banks at the southern end of the site and along grass verges to the southern entrance route (Option H). Traditional rose beds at the northern end are intensive in terms of management and could either be replaced with a sustainable perennial planting scheme or adapted through under-planting (Option I). The north-east corner of the site lends itself to a more wild area with compost bins to recycle/reuse waste produced during maintenance (Option J).

The Ecology Consultancy

Job title
Shoreham Harbour Regeneration
ECL Job no. 3333

Client
Adur District Council

Drawing title
ENHANCEMENT SITES MAP

Section:	Scale (at A3)
Site 7	1:1,000

Date of survey: April 2015

Surveyor: Ben Kimpton

Drawn	Checked
RM	BK

Approved	Date
GC	01/05/2015

KEY

- Shoreham Harbour Regeneration Boundary
- Strategic Sites Boundary
- A — Enhancement Sites and options - see accompanying notes

This plan is provided solely for the purpose of supporting the description of the ecological features of the site as contained in the accompanying report

Site Name: **Basin Road North Embankment (Cemex)**		
Site ID Number: **8**	Date: 28.04.15	Size (ha): 0.31
Site Location: between Wellington Road (A259) and Basin Road North, opposite Cemex Brighton Plant and Wharf in Brighton and Hove. Adjacent to strategic site 2: South Portslade.		
Evidence of Management: ~~Yes~~ / No		
Site Condition: Good / ~~Moderate~~ / Poor		

Access: private / ~~public (free)~~ / defacto (unofficial) / ~~restricted~~ / disabled / none

Site Description:

Relatively wide, south facing bank comprising a mosaic of tall ruderal vegetation (c.5%), scrub and scattered trees (c.25%) and grassland (c.70%). The majority of the grassland was species-poor semi-improved but c.10% of the site area comprised semi-improved neutral to calcareous grassland with a more diverse assemblage of grasses and wildflowers. The mix of both native and non-native species increases the diversity.

Trees and scrub comprised ash *Fraxinus excelsior*, wild privet *Ligustrum vulgare*, traveller's joy *Clematis vitalba* and bramble *Rubus fruticosus* agg. amongst others. Grassland was dominated by common couch *Elytrigia repens* with lesser amounts of cock's-foot *Dactylis glomerata* and smooth meadow grass *Poa pratensis*. Upright brome *Bromus erectus* and glaucous sedge *Carex flacca* were locally abundant. Common wildflowers included cow parsley *Anthriscus sylvestris*, hogweed *Heracleum sphondylium*, common knapweed *Centaurea nigra*, ribbed melilot *Melilotus officinalis*, ribwort plantain *Plantago lanceolata*, teasel *Dipsacus fullonum*, common vetch *Vicia sativa* and Spanish bluebell *Hyacinthoides hispanica*. Fennel *Foeniculum vulgare*, red valerian *Centranthus ruber*, blue alkanet *Pentaglottis sempervirens* were locally abundant in the strip to the west of the steps.

Site exposed to coastal wind and noise and air pollution from Wellington Road and Basin Road North.

Key Opportunities For Enhancement:

Retrofit green roofs – intensive / semi-intensive / extensive	
Woody planting – trees / ~~scrub~~ / hedgerows	✓
Landscape planting - sustainable/perennial planting / extend seasonal interest / floristic annual display / other	
Food production - fruit trees / edible hedgerow / vegetables	
Grassland – wildflower meadow / daisy lawn / ~~plug-planting~~ / bulb planting / ~~management change~~ / other	✓
SuDS – pond / rain garden / swale / filter-strip / diverted down-pipe planter / underground tank / other	
Green wall – climber / modular	
Bespoke invertebrate habitat – log-piles / bee-hotels / hibernacula	
Bird boxes	
Bat boxes	
Window boxes / raised planters	
Other	

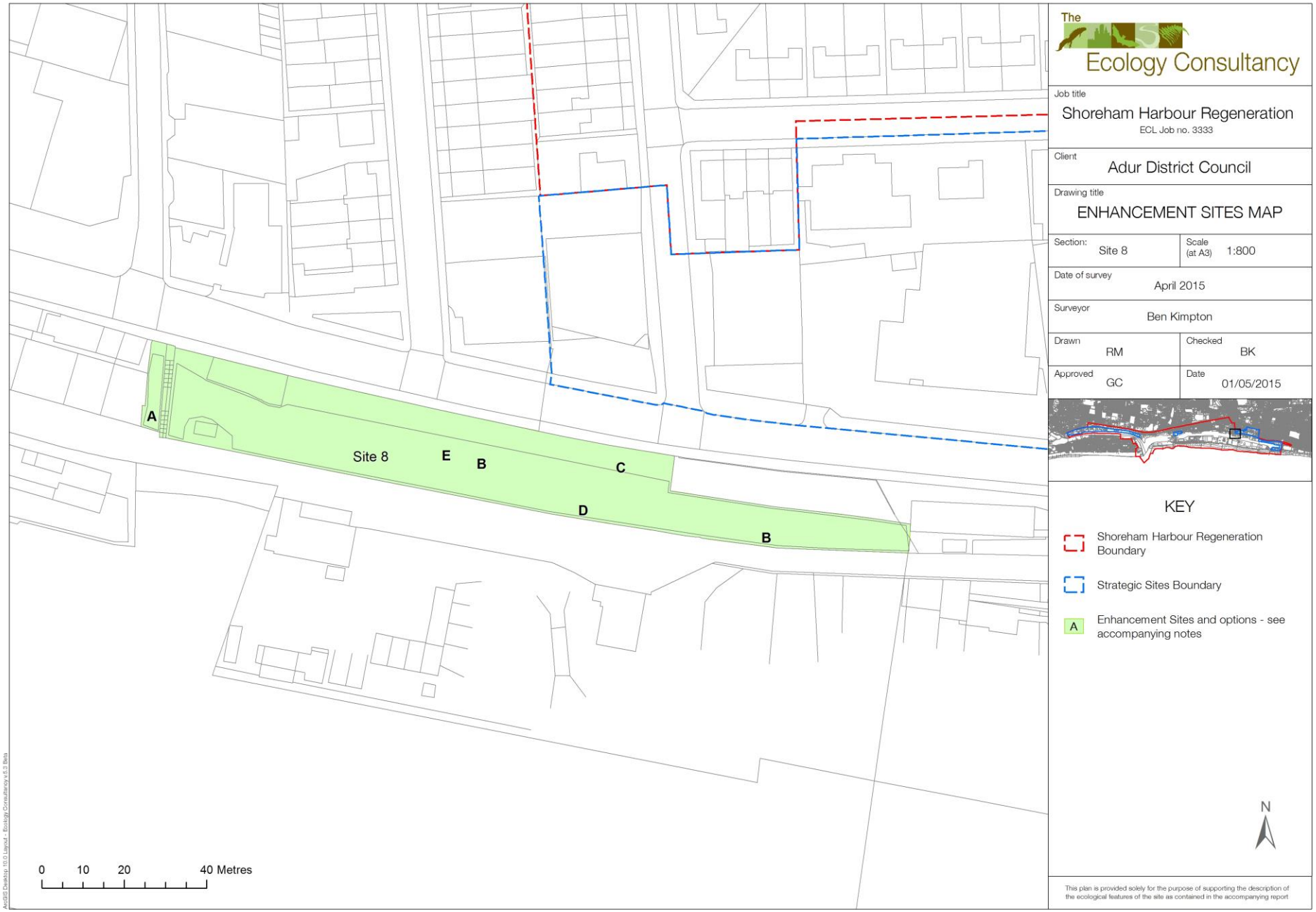
Barriers:		Isolated - green island	✓	Size – small etc.		Underground services		Buildings/structures	✓
Access/transport infrastructure	✓	User level – high ~~low~~		Low visibility		Maintenance	✓	Multiple ownership	

Notes:
Generally the site requires little management, but the monitoring and control of invasive plants needs to be considered (see below). Removal of rubbish would improve the appearance of the site. Trees and scrub add to the botanical diversity of the site and provide habitat for variety of wildlife, but they are likely to spread over time reducing the value of the site, particularly more species rich areas of grassland, and as such removal is recommended (Option D) to maintain trees/scrub at their current extent.

The diversity of species-poor semi-improved grassland could be increased by plug-planting taller/bulkier wildflowers (Option B) such as vetches *Vicia sativa* / *V. cracca*, knapweeds *Centaurea nigra* / *C. scabiosa*, campions *Silene dioica* / *S. latifolia*, agrimony *Agrimonia eupatoria*, wild mignonette *Reseda lutea*, wild parsnip *Pastinaca sativa*, great mullein *Verbascum thapsus* etc. Introducing yellow rattle *Rhinanthus minor* (which is parasitic on grass and reduces its vigour) should also be considered alongside plug-planting.

Montbretia *Crocosmia* x *crocosmiiflora* - an invasive plant species listed under Schedule 9 of the Wildlife and Countryside Act 1981 (as amended) is present in at least two locations. A very large patch of winter heliotrope *Petasites fragrans* was also present which is an aggressive non-native species but not listed on Schedule 9. Any future works that could potentially cause the spread of montbretia (Option B) should be avoided or correctly mitigated for if works are unavoidable. Whilst winter heliotrope is not listed as an invasive plant species under Schedule 9 it should be treated in the same way (Option C).

A potential fox *Vulpes vulpes* den (protected against intentional acts of cruelty under the Wild Mammals (Protection) Act 1996) is present (Option E). To avoid possible contravention, due care and attention should be taken when carrying out works near fox dens. It may be necessary to exclude the fox(s) before works to prevent cruelty of animals that may be present.


A
Site 8
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The Ecology Consultancy
Job title
Shoreham Harbour Regeneration
ECL Job no. 3333
Client
Adur District Council
Drawing title
ENHANCEMENT SITES MAP
Section: Site 8
Scale (at A3) 1:800
Date of survey
April 2015
Surveyor
Ben Kimpton
Drawn
RM
Checked
BK
Approved
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Date
01/05/2015
KEY
Shoreham Harbour Regeneration Boundary
Strategic Sites Boundary
A
Enhancement Sites and options - see accompanying notes
N
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Site Name: **Frontage West Road and Fishersgate Terrace**		
Site ID Number: **9**	Date: 21.04.15	Size (ha): 0.84
Site Location: Southern and eastern frontage to social housing (Old Mill Close and Westlands Court respectively), situated on the corner of West Road and Fishersgate Terrace (A259) in Fishersgate, Adur. Main entrances to buildings are on Chapel Road and Layland Road.		
Evidence of Management: ~~Yes~~ / No		
Site Condition: Good / ~~Moderate~~ / Poor		

Access: private / public (free) / ~~defacto (unofficial)~~ / restricted / disabled / none

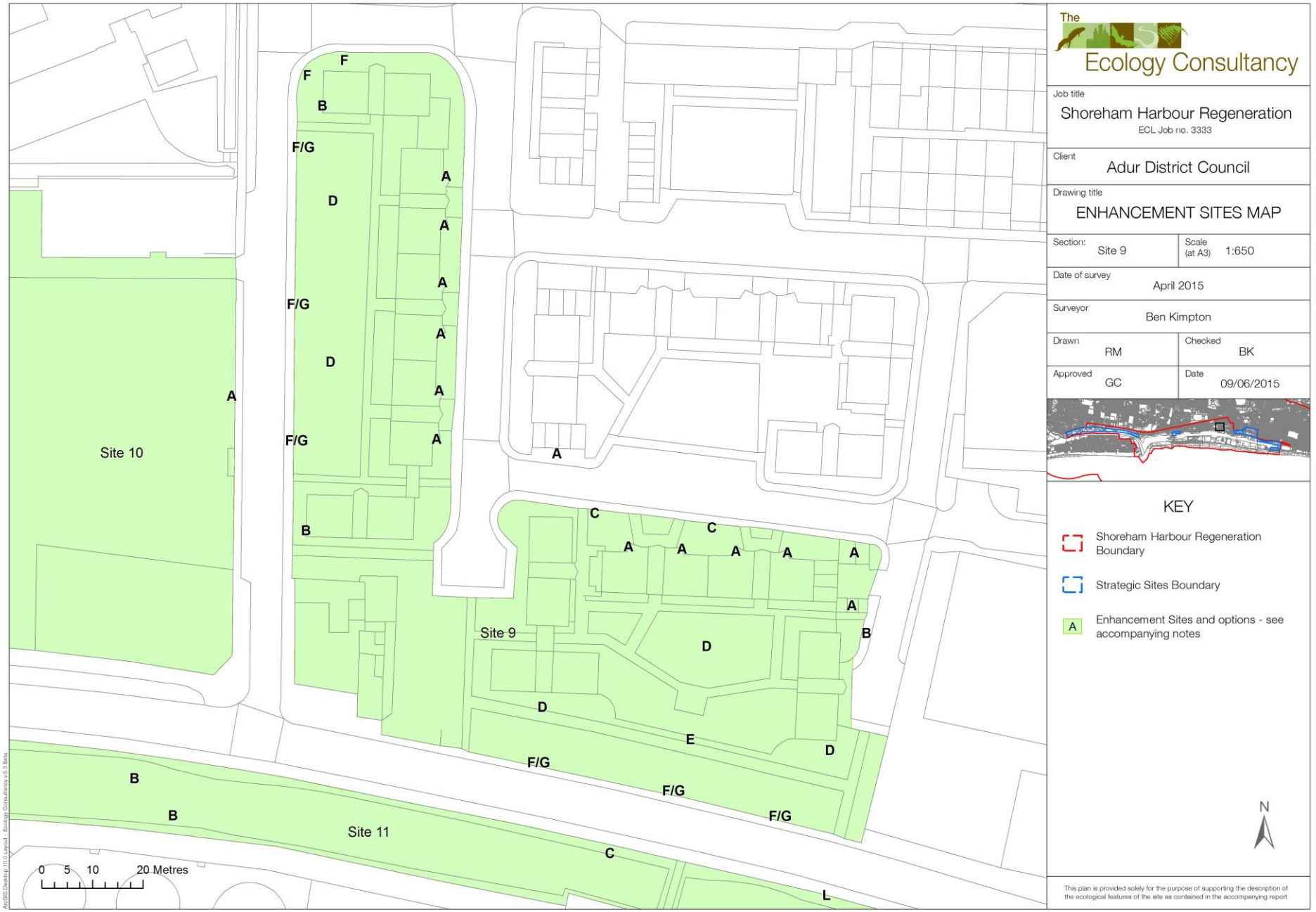
Site Description: Site dominated by large blocks of amenity grassland (95%) including two long strips fronting West Road and Fishersgate Terrace. Scattered trees present around Old Mill Close with shrub and herbaceous planting in narrow beds outside buildings and in raised railway sleeper planters (5%). Forms part of a larger estate which also includes Wyck Court to the north. Site exposed to coastal wind and noise and air pollution from Fishersgate Terrace.

Key Opportunities For Enhancement (frontage only):

Retrofit green roofs – intensive / semi-intensive / ~~extensive~~ (Option A)	✓
Woody planting – ~~trees~~ / ~~scrub~~ wall fronting Fishergate Terrace (Option E) / ~~hedgerows~~ (Option G)	✓
Landscape planting - ~~sustainable/perennial planting~~ / extend seasonal interest / floristic annual display / other	✓
Food production - fruit trees / edible hedgerow / ~~vegetables~~ in existing raised planters (Option C).	✓
Grassland – ~~wildflower meadow~~ / ~~daisy lawn~~ / plug-planting / ~~bulb planting~~ / ~~management change~~ / other	✓
SuDS – pond / ~~rain garden~~ / swale / filter-strip / ~~diverted down-pipe planter~~ / underground tank / other	✓
Green wall – ~~climber~~ / modular (Option B)	✓
Bespoke invertebrate habitat – log-piles / bee-hotels / hibernacula	
~~Bird boxes~~ only if foraging habitat is increased	✓
Bat boxes	
~~Window boxes / raised planters~~	✓
Other	

Barriers:		Isolated - green island		Size – small etc.		Underground services	?	Buildings/structures	
Access/transport infrastructure		User level – high low		Low visibility		Maintenance	✓	Multiple ownership	✓

Notes: The wider estate provides a larger number of enhancement options due to its size and high percentage of greenspace. The main options for enhancing the frontage are based around creating daisy/bulb lawns and/or wildflowers strips (Option F) using areas of amenity grassland along West Road and Fishersgate Terrace. Sustainable landscape planting schemes including climbers on brick walls / fencing (Option B), scrub or species rich native hedgerows (Option E/G) as a buffer to noise and pollution and planting into empty raised planters are other viable options. A number of smaller roofs above bin stores and entrances to stairwells on Chapel Road and Laylands Road could potentially be retrofitted with green roofs, although without additional support the loading may not be high enough to receive anything more than lightweight extensive systems. The garage roofs on George Street may be able to support deeper green roof substrates, but should always be confirmed by a structural engineer. Whilst requiring greater capital investment rain gardens (Option D) have high potential due to the presence of a large number of external rainwater pipes and large areas of adjacent grassland. These could receive run-off from roofs, diverted to a planted depression in the grassland which connects back into the main drainage system.


Site 10
Site 9
Site 11
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0 5 10 20 Metres
The Ecology Consultancy
Job title
Shoreham Harbour Regeneration
ECL Job no. 3333
Client
Adur District Council
Drawing title
ENHANCEMENT SITES MAP
Section: Site 9
Scale (at A3) 1:650
Date of survey
April 2015
Surveyor
Ben Kimpton
Drawn
RM
Checked
BK
Approved
GC
Date
09/06/2015
KEY
Shoreham Harbour Regeneration Boundary
Strategic Sites Boundary
A
Enhancement Sites and options - see accompanying notes
N
This plan is provided solely for the purpose of supporting the description of the ecological features of the site as contained in the accompanying report
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Site Name: **Fishersgate Recreation Ground**		
Site ID Number: **10**	Date: 21.04.15	Size (ha): 1.12
Site Location: adjacent to Fishersgate Terrace (A259) in Adur. Access road to on-site car park is off West Road. Two footpaths link the site to Gardner Road to the north-west. Fishersgate Community Centre is adjacent to the site to the west.		
Evidence of Management: ~~Yes~~ / No		
Site Condition: ~~Good~~ / Moderate / Poor		

Access: private / ~~public (free)~~ / defacto (unofficial) / restricted / disabled / none

Site Description: Recreation ground dominated by c.95% amenity grassland (used mainly as a sports pitch) with scattered trees and c.5% hard-standing. A group of pine trees has recently been planted near to the southern boundary, and a wildflower meadow had been successfully created along half of the southern boundary. A playground was present in the south-east corner of the Park. A Community Park with 'Friends of Fishersgate Rec' (FoFR) actively involved in its regeneration. Site quite exposed to coastal wind and noise and air pollution from Fishersgate Terrace.

Key Opportunities For Enhancement:

Retrofit green roofs – intensive / semi-intensive / extensive	
Woody planting – ~~trees~~ / ~~scrub~~ / ~~hedgerows~~	✓
Landscape planting - ~~sustainable/perennial planting~~ / extend seasonal interest / floristic annual display / other	✓
Food production - ~~fruit trees / edible hedgerow / vegetables~~	✓
Grassland – ~~wildflower meadow / daisy lawn / plug planting / bulb planting / management change~~ / other	✓
SuDS – ~~pond / rain garden / swale / filter strip~~ / diverted down-pipe planter / underground tank / other	✓
Green wall – climber / modular	
Bespoke invertebrate habitat – log-piles / bee-hotels / hibernacula	
~~Bird boxes~~ - in the holm oaks along the west boundary	✓
Bat boxes	
Window boxes / raised planters	
Other	

Barriers:		Isolated - green island	✓	Size – small etc.		Underground services		Buildings/structures	
Access/transport infrastructure		User level – ~~high~~ low	✓	Low visibility		Maintenance	✓	Multiple ownership	

Notes: A small park but with potential for a number of ecological enhancements. The bank along the eastern boundary could receive a strip of wildflowers similar to that along the southern boundary (Option A). Any future works that could potentially cause the spread of montbretia *Crocosmia* x *crocosmiiflora* present under the holm oaks (an invasive plant listed on Schedule 9 of the wildlife and Countryside Act 1981 (as amended)) should be avoided or correctly mitigated for if works are unavoidable (Option B). The bed under the holm oaks could be planted with woodland bulbs tolerant of dry conditions. Bird boxes for common species such as blue tit *Cyanistes caeruleus* could be installed in the holm oaks along the west boundary. The metal railings along the southern and eastern boundary could be replaced with a species rich native hedgerow (Option E) which would provide wildlife habitatand also a more visually pleasing buffer to Fishersgate Terrace (A259). If the hard-standing of the car park is to be re-surfaced there is an opportunity to camber the surface towards a rain garden or filter strip which would link to the existing drain (Option F). The local community is involved in the site and the creation of a pond is therefore viable. It would provide a wetland feature and educational resource, but would require fencing to avoid trampling by dogs and any health and safety concerns etc.

The Ecology Consultancy

Job title
Shoreham Harbour Regeneration
ECL Job no. 3333

Client
Adur District Council

Drawing title
ENHANCEMENT SITES MAP

Section: Site 10	Scale (at A3) 1:700
Date of survey: April 2015	
Surveyor: Ben Kimpton	
Drawn: RM	Checked: BK
Approved: GC	Date: 09/06/2015

KEY

- Shoreham Harbour Regeneration Boundary
- Strategic Sites Boundary
- A — Enhancement Sites and options - see accompanying notes

N

This plan is provided solely for the purpose of supporting the description of the ecological features of the site as contained in the accompanying report

ArcGIS Desktop 10.0 Layout - Ecology Consultancy v5.3 Beta

Site Name: **North Canal Bank Below A259**		
Site ID Number: **11**	Date: 28.04.15	Size (ha): 2.35
Site Location: approximately 1.3km long, south facing bank to the south of Fishersgate Terrace/Albion Street (A259). Basin Road North runs parallel with the lower bank at the eastern end of the site at Nicolson's Wharf, turning into an informal track/path which runs for the remaining length of the site until Lady Bee Marina.		
Evidence of Management: ~~Yes~~ / No		
Site Condition: Good / ~~Moderate~~ / Poor		

Access: private / ~~public (free)~~ / ~~defacto (unofficial)~~ / restricted / disabled / ~~none~~

Site Description:

Site exposed to coastal wind. Largely comprised of a mosaic of grassland, tall-ruderal vegetation and scrub/trees, with smaller amounts of hard-standing, ephemeral/short perennial vegetation, bareground and exposed cliffs, scattered coastal/vegetated shingle plants and non-native hedgerows. Amenity, species-poor semi-improved and semi-improved grassland types are also present. Typical grasses across the site included common couch *Elytrigia repens*, cock's-foot *Dactylis glomerata*, false-oat grass *Arrhenatherum elatius* and local tall fescue *Festuca arundinacea*. The sward was species-rich in localised areas, particularly above North Canal Bank Slip where it is short and dry/parched. At this location wild carrot *Daucus carota*, common vetch *Vicia sativa*, common knapweed *Centaurea nigra*, perforate St. John's-wort *Hypericum perforatum*, red clover *Trifolium pratense*, field wood rush *Luzula campestris*, ribwort plantain *Plantago lanceolata*, common bird's-foot trefoil *Lotus corniculatus*, yarrow *Achillea millefolium,* common cornsalad *Valerianella locusta* and black medick *Medicago lupulina* are present.

The more commonly occurring tall-ruderal vegetation included cow parsley *Anthriscus sylvestris*, teasel *Dipsacus fullonum*, Alexanders *Smyrnium olusatrum*, Spanish bluebell *Hyacinthoides hispanica*, common nettle *Urtica dioica*, cleavers *Galium aparine*, broad-leaved everlasting pea *Lathyrus latifolius*, hedge bindweed *Calystegia sepium*, hoary cress *Lepidium draba*, fennel *Foeniculum vulgare*, bristly ox-tongue *Helminthotheca echioides*, red valerian *Centranthus ruber* and ribbed melilot *Melilotus officinalis*.

Fifteen scrub and woody climbing plants were present, the more common including wild privet *Ligustrum vulgare*, hawthorn *Crataegus monogyna*, blackthorn *Prunus spinosa*, English elm *Ulmus procera*, elder *Sambucus nigra*, traveller's joy *Clematis vitalba*, bramble *Rubus fruticosus*, ivy *Hedera helix* and gorse *Ulex europaeus*.

The water's edge immediately to the east of North Canal Bank Slip comprised an area of foreshore protected by rocks and artificial substrates. A narrow band of grassland had developed on the upper bank with scattered coastal/shingle plants. Species included sea couch *Elytrigia atherica*, sea beet *Beta vulgaris ssp. maritima*, sea radish *Raphinus raphinastrum ssp. maritimus,* sea plantain *Plantago coronopus*, black medick, ribbed melilot, bristly ox-tongue, ribwort plantain, common bird's-foot trefoil, kidney vetch *Anthyllis vulneraria*, common vetch and a few plants of yellow horned poppy *Glaucium flavum* and the nationally scarce grass *Catapodium marinum*.

A reptile survey of this bank was carried out in 2009 (Halcrow, 2009d). Following Froglife (1999) methodology for population assessments, peak counts indicated the presence of an exceptional population of common lizards (greater than 20 individuals) and a good population of slow worms.

The nationally scarce grey bush cricket *Platycleis albopunctata* has been recorded twice (2008 - TQ2475005000 and 2013 - TQ248050) at this site.

Key Opportunities For Enhancement:

Retrofit green roofs – intensive / semi-intensive / extensive	
Woody planting – trees / scrub / ~~hedgerows~~ – along top of bank bordering pavement	✓
Landscape planting - ~~sustainable/perennial planting~~ / extend seasonal interest / floristic annual display / other	✓
Food production - fruit trees / edible hedgerow / vegetables	
Grassland – ~~wildflower meadow / daisy lawn / plug-planting / bulb planting / management change~~ / other	✓

SuDS – pond / rain garden / swale / filter-strip / diverted down-pipe planter / underground tank / other	
Green wall – climber / modular	
Bespoke invertebrate habitat – ~~log-piles~~ / bee-hotels / hibernacula	✓
Bird boxes	
Bat boxes	
Window boxes / raised planters	
Other	

Barriers:		Isolated - green island		Size – small etc.		Underground services		Buildings/structures	
Access/transport infrastructure		User level – high ~~low~~		Low visibility		Maintenance	✓	Multiple ownership	

Notes:

The second largest of the 15 enhancement sites included in this audit, with the best example of semi-natural habitats and highest diversity of habitat types. It is recommended that a detailed botanical/habitat survey is carried out to accurately inform enhancement and long-term management.

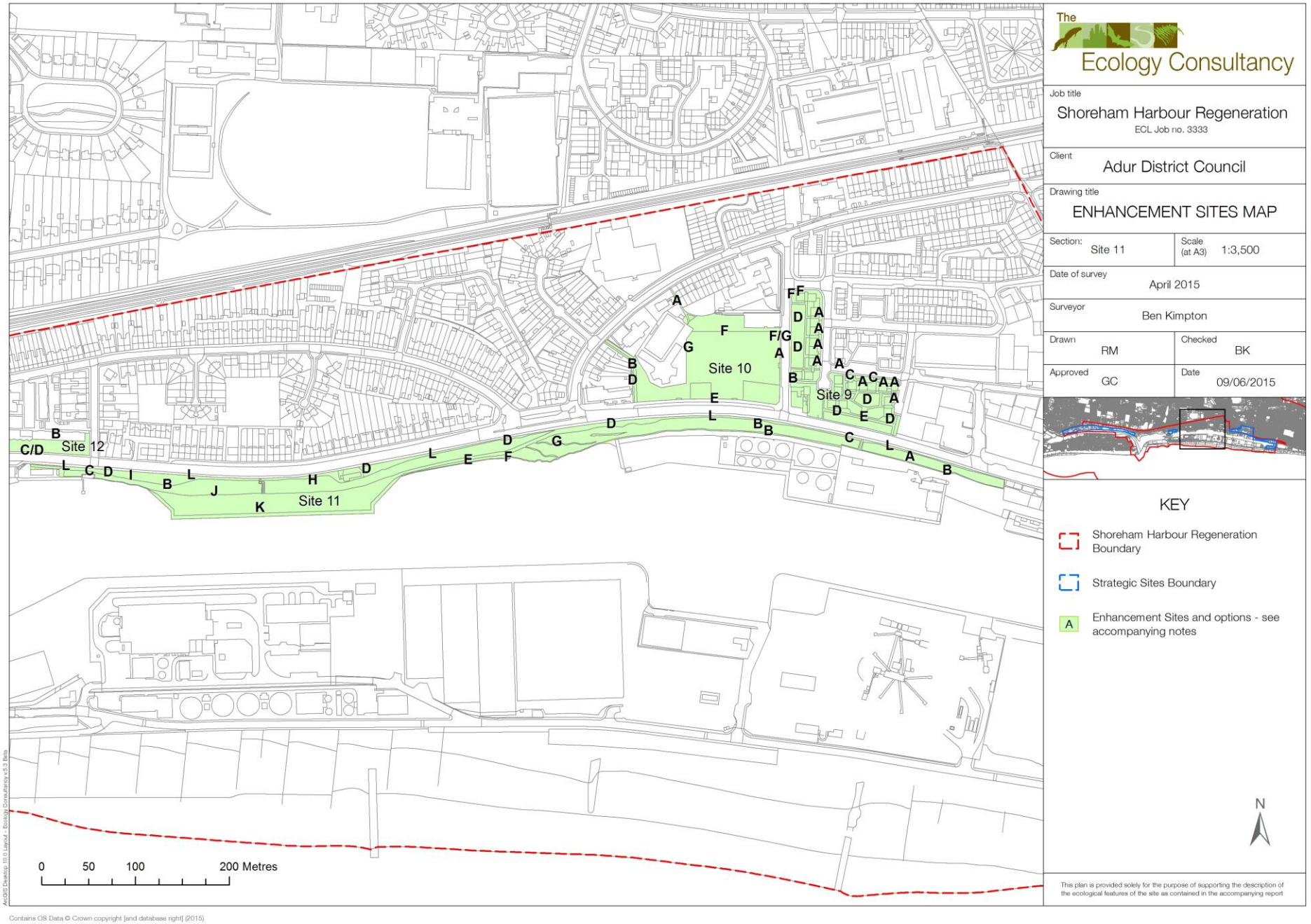
The main value of the site is the intimate mix of scrub, grassland and tall-ruderal present and patches of coastal/vegetated shingle plants. Dense scrub provides high quality nesting habitat for breeding birds. The site is likely to be part of the historic river edge/coastline as it appears to be largely comprised of soft cliffs. A review of historic maps would be a valuable exercise to determine the nature and age of the bank. The bank provides an important green infrastructure role as a linear wildlife corridor in a densely developed part of Shoreham/Adur. Proposals to improve sustainable transport links (cycle and pedestrian path) will increase the value of the site as a recreational space, but should be balanced with its ecological value.

The English elm scrub is of local interest, of potential value to a number of specialist invertebrates such as white letter hairstreak *Satyrium w-album* and should be retained (Option A). Across the site the objective should be to retain scrub habitat at its current extent and avoid its spread into more species rich areas of grassland through hand clearance. One such area is the dry banks above the North Canal Bank Slip (Option H). Log piles could also be added under trees/scrub using material from any arboricultural works (Option G).

Parts of the top of the bank are flat, accessible and managed by mowing. Following the findings of a more detailed botanical/habitat, cutting of the top bank should be timed to avoid the main flowering period of more species-rich swards. Areas of amenity/species-poor semi-improved grassland could be enhanced by plug-planting taller/bulkier wildflowers (Option D) such as vetches *Vicia sativa* / *V. cracca*, knapweeds *Centaurea nigra* / *C. scabiosa*, campions *Silene dioica* / *S. latifolia*, agrimony *Agrimonia eupatoria*, wild mignonette *Reseda lutea*, wild parsnip *Pastinaca sativa*, great mullein *Verbascum thapsus* etc. Introducing yellow rattle *Rhinanthus minor* (which is parasitic on grasses and reduces their vigour) should also be considered alongside plug-planting (Option K).

The foreshore to the east of North Canal Bank Slip has a narrow band of grassland with scattered coastal/shingle plants. Any works to this part of the site should seek to create new areas for the establishment/colonisation of coastal habitats (Option E) and some of the rare plants present such as sea fern grass (Option F).

Japanese knotweed *Fallopia japonica* (B), montbretia *Crocosmia x crocomiiflora* (Option C) and wall Cotoneaster *Cotoneaster horizontalis* (Option I) are all present on-site and are invasive plant species listed under Schedule 9 of the Wildlife and Countryside Act 1981 (as amended). Any future works that could potentially cause their spread should be avoided or correctly mitigated for if works are unavoidable.


Site 12
Site 11
Site 10
Site 9
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The Ecology Consultancy
Job title
Shoreham Harbour Regeneration
ECL Job no. 3333
Client
Adur District Council
Drawing title
ENHANCEMENT SITES MAP
Section: Site 11
Scale (at A3) 1:3,500
Date of survey
April 2015
Surveyor
Ben Kimpton
Drawn RM
Checked BK
Approved GC
Date 09/06/2015
KEY
Shoreham Harbour Regeneration Boundary
Strategic Sites Boundary
A Enhancement Sites and options - see accompanying notes
N
This plan is provided solely for the purpose of supporting the description of the ecological features of the site as contained in the accompanying report
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Site Name: **Frontage To Rock Close**		
Site ID Number: **12**	Date: 28.04.15	Size (ha): 0.30
Site Location: Southern frontage to social housing (Rock Close, Channel View and Albion House), adjacent to Albion Street (A259), running between Station Road and Grange Road in Southwick, Adur. Adjacent to strategic site 3: Southwick Waterfront and Lady Bee Marina.		
Evidence of Management: ~~Yes~~ / No		
Site Condition: ~~Good~~ / Moderate / Poor		

Access: private / public (free) / ~~defacto (unofficial)~~ / restricted / disabled / none

Site Description: Long linear strip of amenity grassland (c.99%) with small area of shrub and herbaceous planting in narrow bed outside Albion House. Forms part of a larger estate situated between Albion Street (A259), Station Road, Butts Road and Grange Road. Site exposed to coastal wind and noise and air pollution from Albion Road.

Key Opportunities For Enhancement (frontage only):

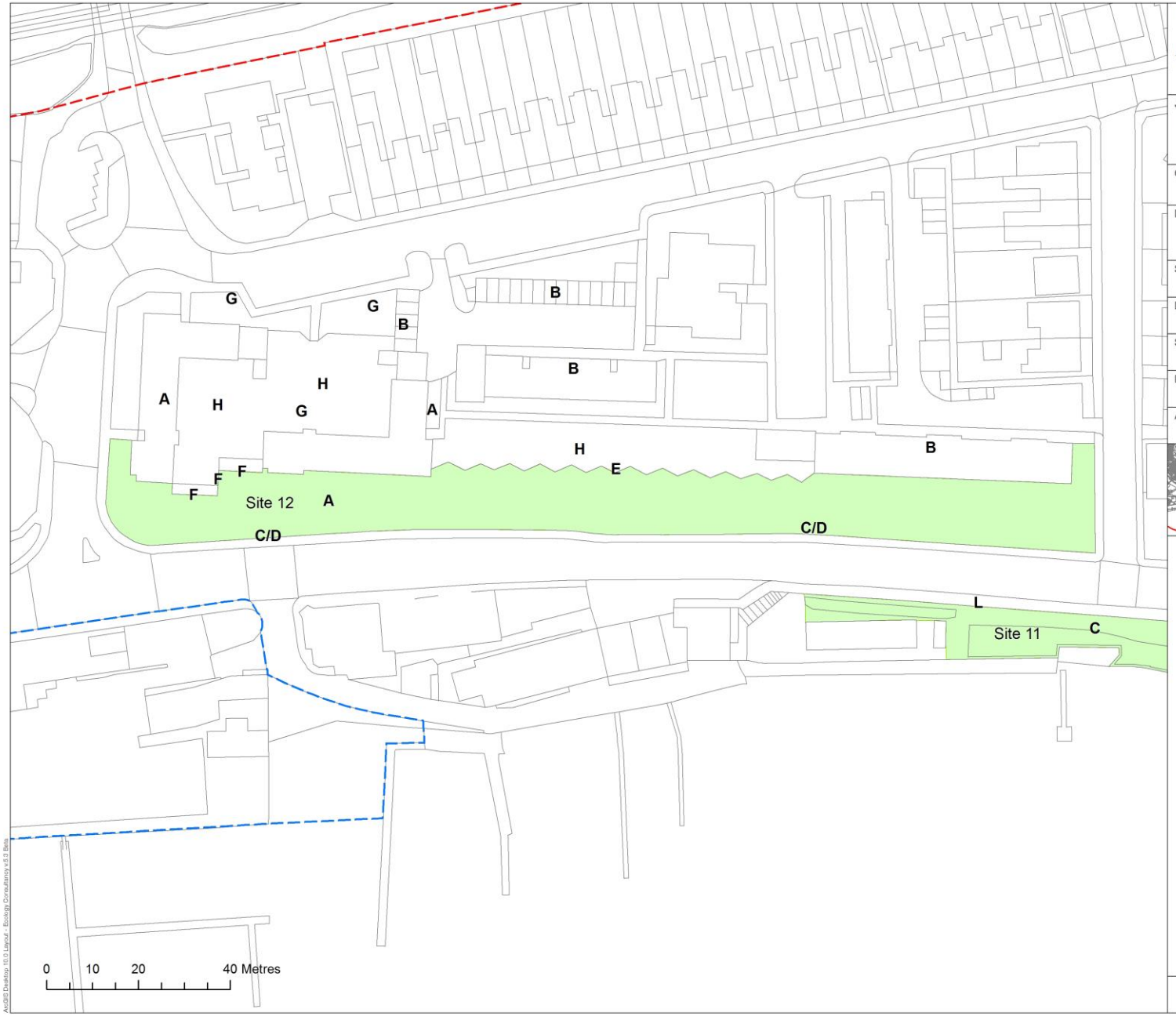
Retrofit green roofs – intensive / semi-intensive / extensive	
Woody planting – ~~trees~~ / ~~scrub~~ wall opp. Channel View (Option E) / ~~hedgerows~~ Albion Street (Option C)	✓
Landscape planting - ~~sustainable/perennial planting~~ / extend seasonal interest / floristic annual display / other	✓
Food production - fruit trees / edible hedgerow / vegetables	
Grassland – ~~wildflower meadow~~ / ~~daisy lawn~~ / plug-planting / ~~bulb planting~~ / ~~management change~~ / other	✓
SuDS – pond / ~~rain garden~~ / ~~swale~~ / ~~filter-strip~~ / ~~diverted down-pipe planter~~ / underground tank / other	✓
Green wall – ~~climber~~ / modular (Option F)	✓
Bespoke invertebrate habitat – log-piles / bee-hotels / hibernacula	
~~Bird boxes~~ only if foraging habitat is increased	✓
Bat boxes	
Window boxes / raised planters	
Other	

Barriers:		Isolated - green island		Size – small etc.		Underground services	?	Buildings/structures	
Access/transport infrastructure		User level – high low		Low visibility		Maintenance	✓	Multiple ownership	✓

Notes:

The main options for enhancing the frontage are based around creating daisy lawns and wildflowers strips (Option D) along Albion Street, sustainable landscape planting schemes including climbers on brick walls (Option F) and species rich native hedgerow (Option C) along Albion Street (A259) to provide wildlife habitat but also as a buffer to noise and pollution. Whilst requiring greater capital investment a rain garden (Options A) also has great potential due to the presence of external downpipes. These could receive run-off from roofs, diverted to a planted depression in the grassland which connects back into the main drainage system. If the pavement on Albion Street was also to be resurfaced at any stage the camber should be adjusted to flow onto the frontage.

The wider estate provides a larger number of enhancement options due to its size and high percentage of greenspace. This includes the retrofitting or green roofs to existing flat roofs including garages (Option B). This is best timed with the replacement of roof material/waterproofing, but is subject to the correct loading capacity being available. The creation of other rain gardens utilising water diverted from down-pipes (Option A). Bird boxes in semi-mature trees (Option G). The creation of other wildflower grassland strips or meadows and the provision of space for food growing (Option E).



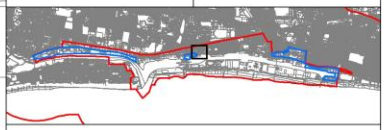
The Ecology Consultancy

Job title
Shoreham Harbour Regeneration
ECL Job no. 3333

Client
Adur District Council

Drawing title
ENHANCEMENT SITES MAP

Section: Site 12	Scale (at A3) 1:800
Date of survey: April 2015	
Surveyor: Ben Kimpton	
Drawn: RM	Checked: BK
Approved: GC	Date: 09/06/2015



KEY

- Shoreham Harbour Regeneration Boundary
- Strategic Sites Boundary
- A — Enhancement Sites and options - see accompanying notes

N

This plan is provided solely for the purpose of supporting the description of the ecological features of the site as contained in the accompanying report

ArcGIS Desktop 10.0 Layout - Ecology Consultancy v.5.1 Beta

Site Name: **Frontage To Coats Court**		
Site ID Number: **13**	Date: 21.04.15	Size (ha): 0.36
Site Location: Southern frontage to Coats Court social housing estate, adjacent to Albion Street (A259), situated between Station Road and Colebrook Road in Southwick, Adur. Adjacent to strategic site 3: Southwick Waterfront.		
Evidence of Management: ~~Yes~~ / No		
Site Condition: ~~Good~~ / Moderate / Poor		

Access: private / public (free) / ~~defacto (unofficial)~~ / restricted / disabled / none

Site Description:

Grass frontage dominated by amenity grassland (99%) with small area of planted shrubbery at western end and one lime tree at eastern end. Grass regularly mown short. Owned by Adur District Council. Forms part of a larger estate situated within the block between Albion Street (A259), Station Road, Butts Road and Grange Road. Site exposed to coastal wind and noise and air pollution from Albion Road.

Key Opportunities For Enhancement (frontage only):

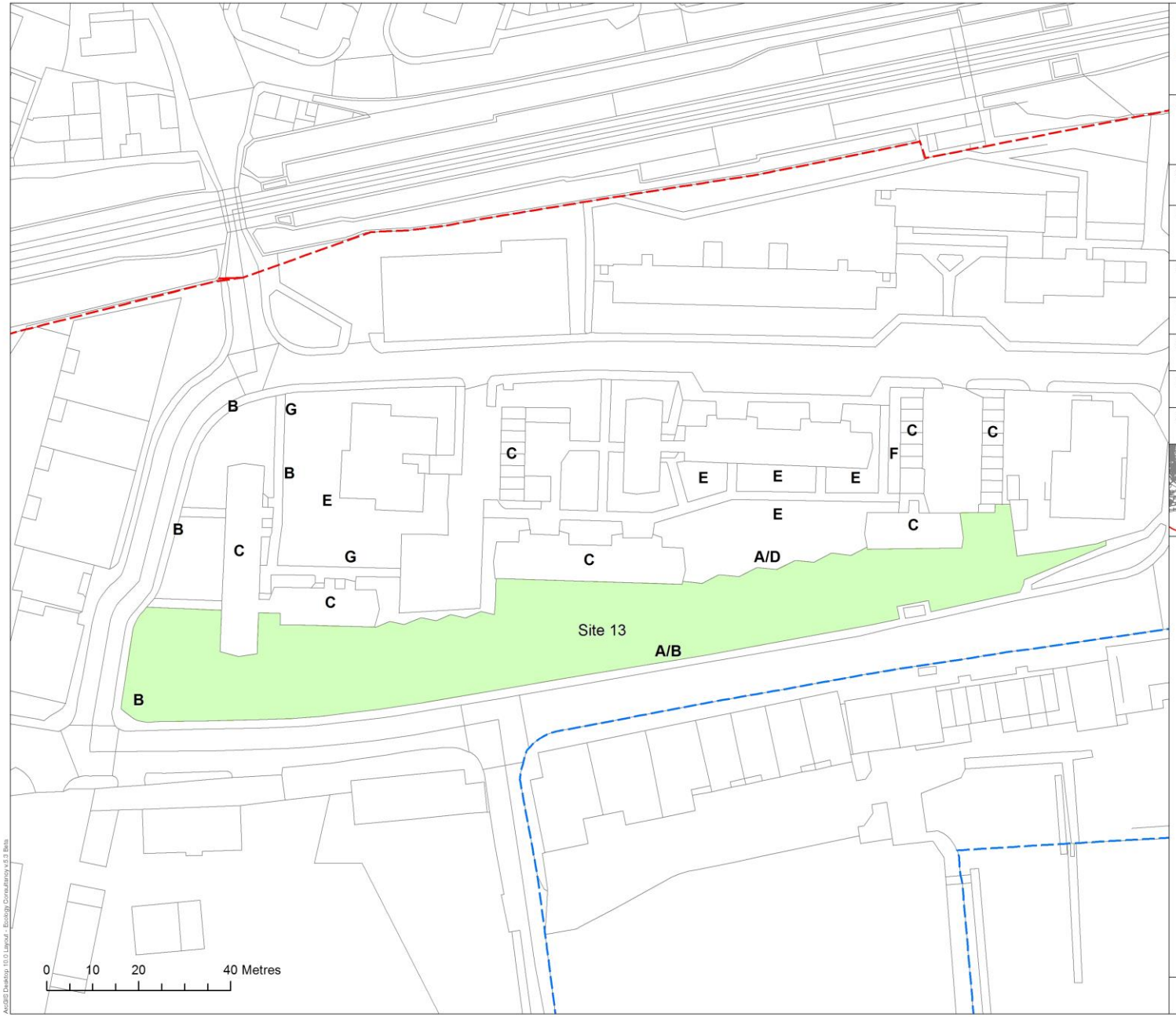
Retrofit green roofs – intensive / semi-intensive / extensive	
Woody planting – ~~trees~~ / ~~scrub~~ / ~~hedgerows~~ along Albion Street (Option A)	✓
Landscape planting - ~~sustainable/perennial planting~~ / extend seasonal interest / floristic annual display / other	✓
Food production - fruit trees / edible hedgerow / vegetables	
Grassland – ~~wildflower meadow~~ / ~~daisy lawn~~ / plug-planting / ~~bulb planting~~ / ~~management change~~ / other	✓
SuDS – pond / rain garden / swale / filter-strip / diverted down-pipe planter / underground tank / other	
Green wall – climber / modular	
Bespoke invertebrate habitat – log-piles / bee-hotels / hibernacula	
Bird boxes	
Bat boxes	
Window boxes / raised planters	
Other	

Barriers:		Isolated - green island		Size – small etc.		Underground services	?	Buildings/structures	
Access/transport infrastructure		User level – high low		Low visibility		Maintenance	✓	Multiple ownership	✓

Notes:

The main options for enhancing the frontage are based around grassland, sustainable landscape planting schemes and native hedgerows. A rain garden is a future option but only if Coats Court is to be redeveloped or if the pavement along Albion Street is to be resurfaced so that the camber moves surface water onto the frontage.

The wider estate provides a large number of enhancement options due to its size and high percentage of greenspace. This includes the creation of new species rich native hedgerow along boundaries (Option A) to provide wildlife habitat but also as a buffer to noise and pollution from Albion Street (A259). Creation of wildflower grassland strips or meadows (Option B). The retrofitting or green roofs to existing flat roofs including garages (Option C). This is best timed with the replacement of roof material/waterproofing, but is subject to the correct loading capacity being available. Tree planting which could be combined with Option A. Provision of space for food growing (Option E). Climbers on walls (Option F). Bird boxes in semi-mature trees (Option G).



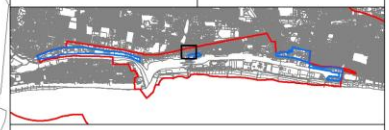
The Ecology Consultancy

Job title
Shoreham Harbour Regeneration
ECL Job no. 3333

Client
Adur District Council

Drawing title
ENHANCEMENT SITES MAP

Section: Site 13	Scale (at A3) 1:800
Date of survey: April 2015	
Surveyor: Ben Kimpton	
Drawn: RM	Checked: BK
Approved: GC	Date: 09/06/2015



KEY

- Shoreham Harbour Regeneration Boundary
- Strategic Sites Boundary
- A — Enhancement Sites and options - see accompanying notes

N

This plan is provided solely for the purpose of supporting the description of the ecological features of the site as contained in the accompanying report

ArcGIS Desktop 10.0 Layout - Ecology Consultancy v5.3 Beta

Site Name: **Kingston Beach**		
Site ID Number: **14**	Date: 19.08.15	Size (ha): 3.45
Site Location: Beach, Rowing Club and Lifeboat Station at Harbour Mouth adjacent to Brighton Road (A259). Northgate Vehicle Hire present at western end with Sussex Marine Watersports at eastern end of site. Adjacent to strategic site 4: Western Harbour Mouth.		
Evidence of Management: ~~Yes~~ / No		
Site Condition: Good / ~~Moderate~~ / Poor		

Access: ~~private~~ / ~~public (free)~~ / defacto (unofficial) / restricted / disabled / none (Shoreham Rowing Club private)

Site Description:
Kingston Beach has status as a Village Green and includes Shoreham RNLI Lifeboat Station and Shoreham Rowing Club which are both present at the western end of the site. The site also includes a lighthouse, public benches, car parking and storage areas associated with the Lifeboat Station and Rowing Club. Vehicle access is off Brighton Road with two sets of steps from Brighton Road provided for pedestrians.

The site is exposed to coastal wind and along its northern edge, noise and air pollution from Brighton Road. It largely comprises intertidal habitats included unvegetated shingle (c.40%), intetidal mud/sands/small cobbles (c.28%) and artificial rocky foreshore with large concrete boulders (c.7%). Other habitats include buidlings/hard-standing/gravel/bareground (c.14%), coastal grassland (c.5%), vegetated shingle (5%), amenity grassland (c.1%) and scrub/planted shrubbery (<1%).

Unvegetated shingle stretches east to west forming a series of shingle ridges from the top of the site (A259) down to the foreshore. The upper section of shingle is consolidated (and supported by a long, parallel wooden groyne) and comprises coastal grassland and vegetated shingle habitats (see below). A series of wooden groynes, slipways and and jetties run perpendicular across the shingle. The foreshore comprises mud/sands and small cobbles exposed at low tide with an area of artificial rocky foreshore at the western end which extends into the mouth of the harbour. Large concrete blocks and boulders protect the southern tip of the site and along with an outfall pipe and wooden jetty create rock pools and provide substrates for a range of crustaceans and algae. Mussel beds, periwinkles and shore crabs are present, along with fish species associated with rocky, shallow seas and pools such as gobbies *Gobius* spp., corkwing wrasse *Symphodus melops*, bullhead *Taurulus bubalis* and blenny *Lipophrys pholis* (see http://www.glaucus.org.uk/Lowtide.htm).

The narrow strip of coastal grassland along the northern boundary of the site was dominated by sea couch, with frequent hawkweed oxtongue *Picris hieracioides*, common mallow *Malva sylvestris* and field bindweed *Convolvulus arvensis* and locally frequent fennel *Foeniculum vulgare*, prickly lettuce *Lactuca serriola* and ragwort *Senecio jacobaea*.

Dry coastal grassland and disturbed ground around the clocktower and rowing club included abundant buck's-horn plantain *Plantago coronopus*, frequent ribwort plantain *Plantago lanceolata*, perennial ryegrass *Lolium perenne* and *knotgrass Polygonum aviculare* and locally frequent rough clover *Trifolium scabrum*, biting stonecrop *Sedum acre* and black medick.

Vegetated shingle at the back of the beach comprised frequent spear-leaved orache *Atriplex prostrata* and occasional sea beet, curled dock *Rumex crispus* and sea kale Crambe maritime.

Two nationally scarce plants have been recorded at Kingston Beach i.e. golden samphire Inula crithmoides (2006 - TQ2341904881 and toothed medick *Medicago polymorpha* (2003 - TQ23500494). The latter was recorded during this assessment, but it is considered that the former was lost during the building of the new Lifeboat Station in 2010.

Key Opportunities For Enhancement:

Retrofit green roofs – intensive / semi-intensive / ~~extensive~~ (Rowing Club)

Woody planting – trees / scrub / hedgerows

Landscape planting - ~~sustainable/perennial planting / extend seasonal interest~~ (Rowing Club)	✓
Food production - fruit trees / edible hedgerow / vegetables	
Grassland – wildflower meadow / daisy lawn / plug-planting / bulb planting / management change / ~~other~~	✓
SuDS – pond / rain garden / swale / filter-strip / diverted down-pipe planter / underground tank / other	
Green wall – climber / modular	
Bespoke invertebrate habitat – log-piles / bee-hotels / hibernacula	
Bird boxes	
Bat boxes	
Window boxes / raised planters	
Other – ~~vegetated shingle habitat creation~~	✓

Barriers:		Isolated - green island		Size – small etc.		Underground services		Buildings/structures	✓
Access/transport infrastructure		User level – ~~high~~ low	✓	Low visibility		Maintenance		Multiple ownership	

Notes:

The rocky foreshore is used by the local community for rock pooling. Large boulders forming part of the artifical rocky foreshore could be enhanced and as part of an ecological-education project (Option A). Cores could be drilled into the stone in-situ to replicate the approach of Bioblocks™ developed by RPC Contracts Ltd and Dr Firth in collaboration with SEACAMS. Other suitable intertidal projects include the use of 'vertipools' as designed and used in Yarmouth by Eccleston George and Natural Enterprise. For further detail on intertidal enhacenments see Section 5: Enhancements.

The upper section of the beach is partly consolidated and protected by the wooden groyne running parallel with the shoreline (see photograph). With upgrading to the groyne and back-filling of shingle the impact of stochastic events such as storm surges on the back section of the beach would be reduced. Vegetated shingle is likely to develop further providing the impact from recreational pressure (trampling of plants, nutrient enrichment etc.) is managed. The inclusion of sand on the most consolidated sections of the beach would increase the opportunity of plant colonisation futher. Options for boardwalks thorugh the vegetated shingle to improve and manage public access should be considered. The use of interpretation boards will assist in reducing impacts by educating site users on the impotance of vegetated shingle habitats (Option B). The area of shingle adjacent to the Lifeboat Station has potential to be colonised by vegetated shingle over time and could be used as a site for vegetetd shingle creation. Access would need to be managed in this area to minimise recreational pressure (Option D).

Grassland around the clocktower should continue to be cut short (with arising removed) to maintain the open habitat required by the nationally scarce plant toothed medick, that is foud in this location (Option C). Small pockets of scrub are developing at the back of the beach including sycamore and elder. These should be removed (Option E).

The retrofitting of a green roof to the Rowing Club should be considered (Option F). This is best timed with the replacement of roof material/waterproofing, but is subject to the correct loading capacity being available. Where this enhancement is viable the use of native coastal plants should be prioritised including the collection and sowing of toothed medick onto appropriate substrates at roof level.

A short section of mud/coastal bank (c.300mm high) is present the base of the coastal grassland strip (Option G). It provides a small area of dry vertical habitat suitable for burrowing hymenoptera (bees etc.) and should be retained. Implementation of Options B and E are likely to assist in this.

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Job title
Shoreham Harbour Regeneration
ECL Job no. 3333

Client
Adur District Council

Drawing title
ENHANCEMENT SITES MAP

Section:	Scale (at A3)
Site 14	1:1,250

Date of survey: April 2015

Surveyor: Ben Kimpton

Drawn	Checked
RM	BK

Approved	Date
GC	09/06/2015

KEY

- Shoreham Harbour Regeneration Boundary
- Strategic Sites Boundary
- A — Enhancement Sites and options - see accompanying notes

N

This plan is provided solely for the purpose of supporting the description of the ecological features of the site as contained in the accompanying report

ArcGIS Desktop 10.0 Layout - Ecology Consultancy v5.3 Beta

Site Name: **The Ham**

Site ID Number: **15** | Date: 21.04.15 | Size (ha): 0.35

Site Location:

Triangle shaped parcel of land surrounded by Brighton Road (A259) to the south and Eastern Avenue to the north and west. In Shoreham, Adur. Adjacent to strategic site 4: Western Harbour Arm.

Evidence of Management: ~~Yes~~ / No

Site Condition: ~~Good~~ / Moderate / Poor

Access: private / ~~public (free)~~ / defacto (unofficial) / restricted / disabled / none

Site Description:

Public open space used primarily as a skate park which is located in the western half of the site. Surrounded by roads with high traffic (noise/air pollution) levels surrounded by Dominated by amenity grassland (c.80%). Six scattered trees present along boundaries including four semi-mature (one ash *Fraxinus excelsior* and three sycamore *Acer pseudoplatanus).* Established garden privet hedge *Ligustrum ovalifolium* along boundaries in eastern half of site, but in four short and one long section. Area of grassland at eastern end with ox-slip *Primula veris* and thyme-leaved speedwell *Veronica serphyllifolia*. Site quite exposed to coastal wind and noise and air pollution from Brighton Road.

Key Opportunities For Enhancement:

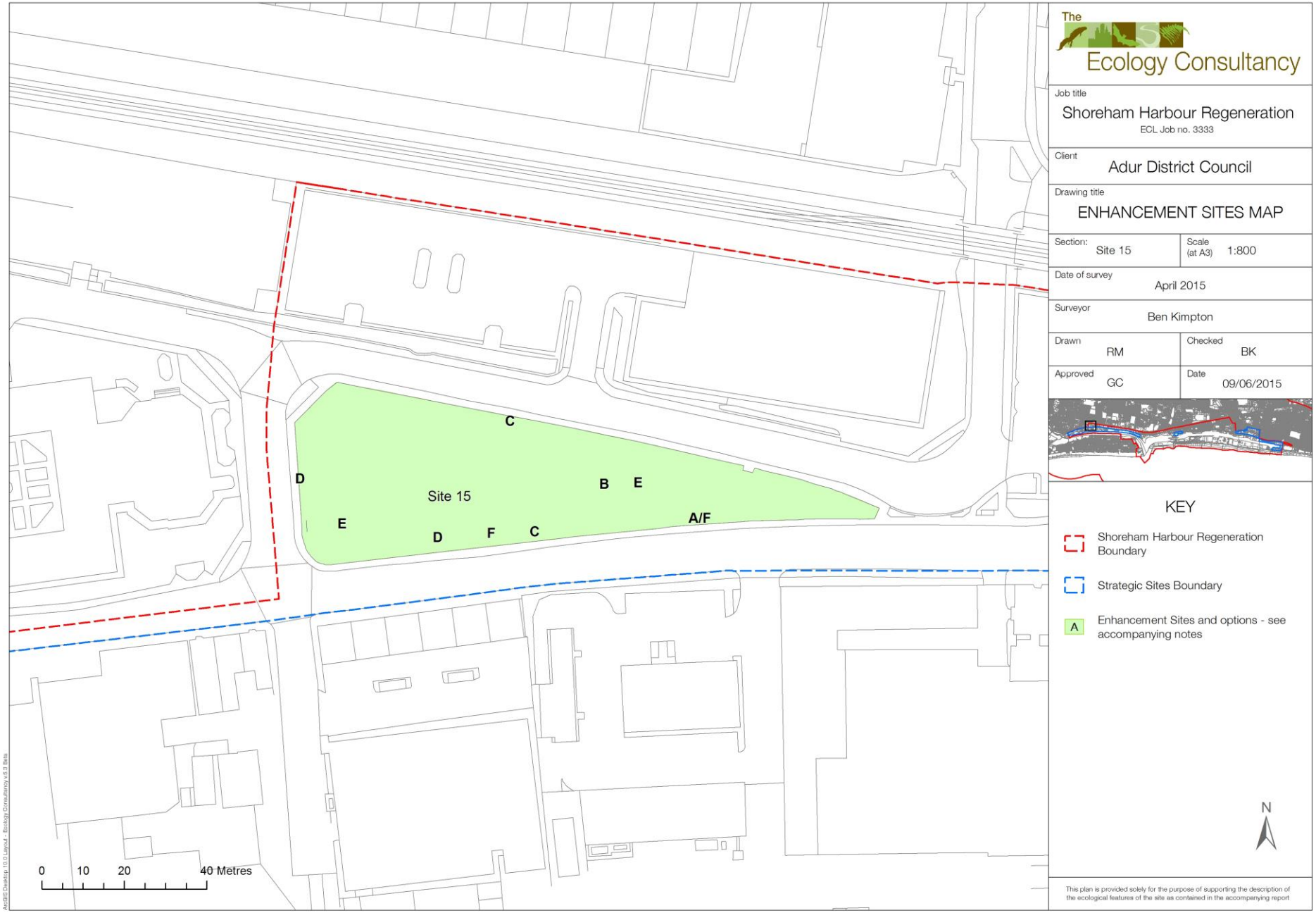
Retrofit green roofs – intensive / semi-intensive / extensive	
Woody planting – ~~trees~~ / scrub / ~~hedgerows~~ – gap up privet hedge or create new native hedge (Option F)	✓
Landscape planting - sustainable/perennial planting / extend seasonal interest / floristic annual display / other	
Food production - ~~fruit trees~~ / edible hedgerow / vegetables (Option E)	
Grassland – ~~wildflower meadow~~ / ~~daisy lawn~~ / ~~plug-planting~~ / ~~bulb planting~~ / ~~management change~~ / other	✓
SuDS – pond / rain garden / ~~swale~~ / filter-strip / diverted down-pipe planter / underground tank / other	✓
Green wall – climber / modular	
Bespoke invertebrate habitat – log-piles / bee-hotels / hibernacula	
~~Bird boxes~~ in semi-mature trees (Option C)	✓
Bat boxes	
Window boxes / raised planters	
Other	

Barriers:		Isolated - green island	✓	Size – small etc.		Underground services		Buildings/structures	
Access/transport infrastructure		User level – ~~high~~ low		Low visibility		Maintenance	✓	Multiple ownership	

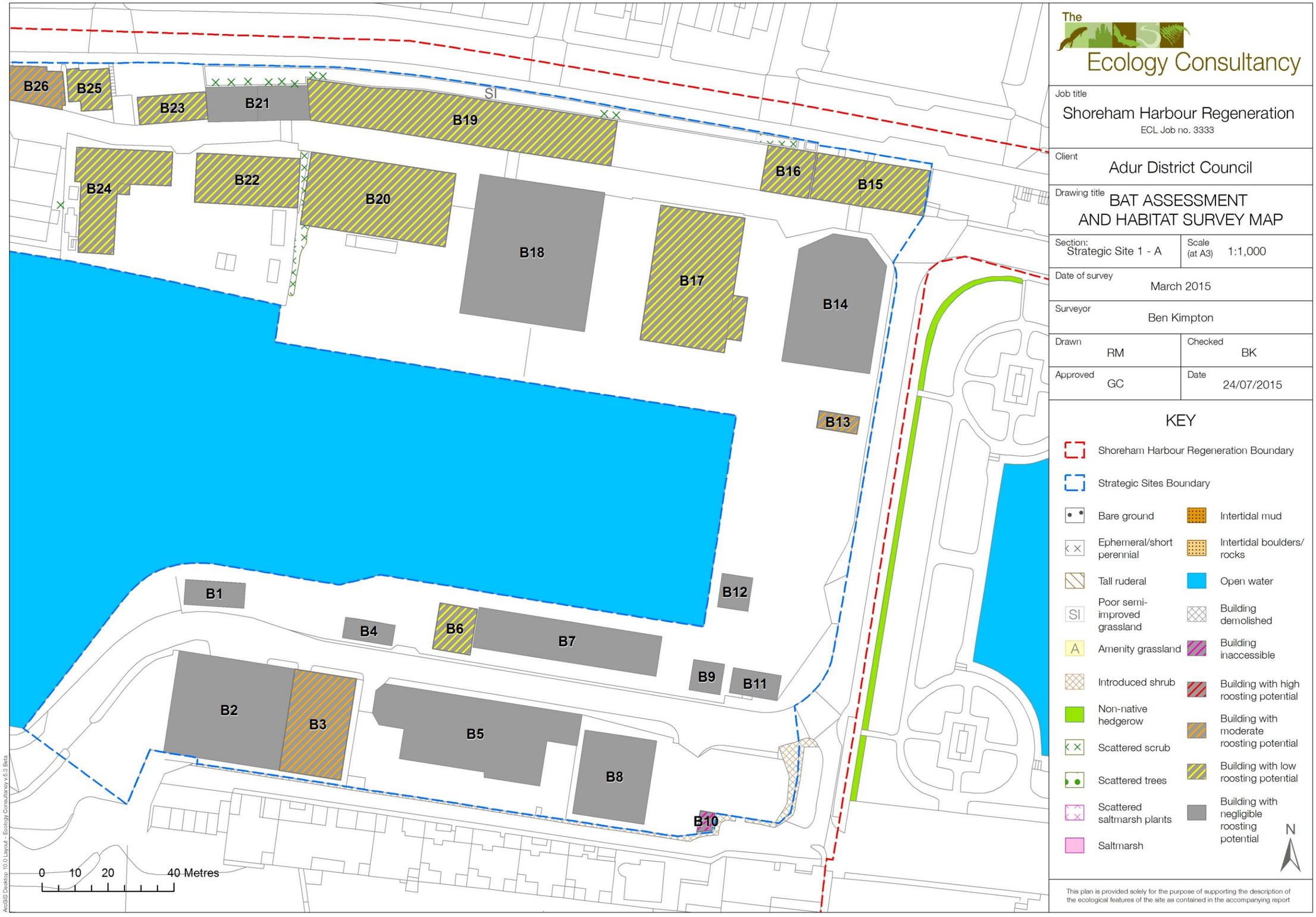
Notes:

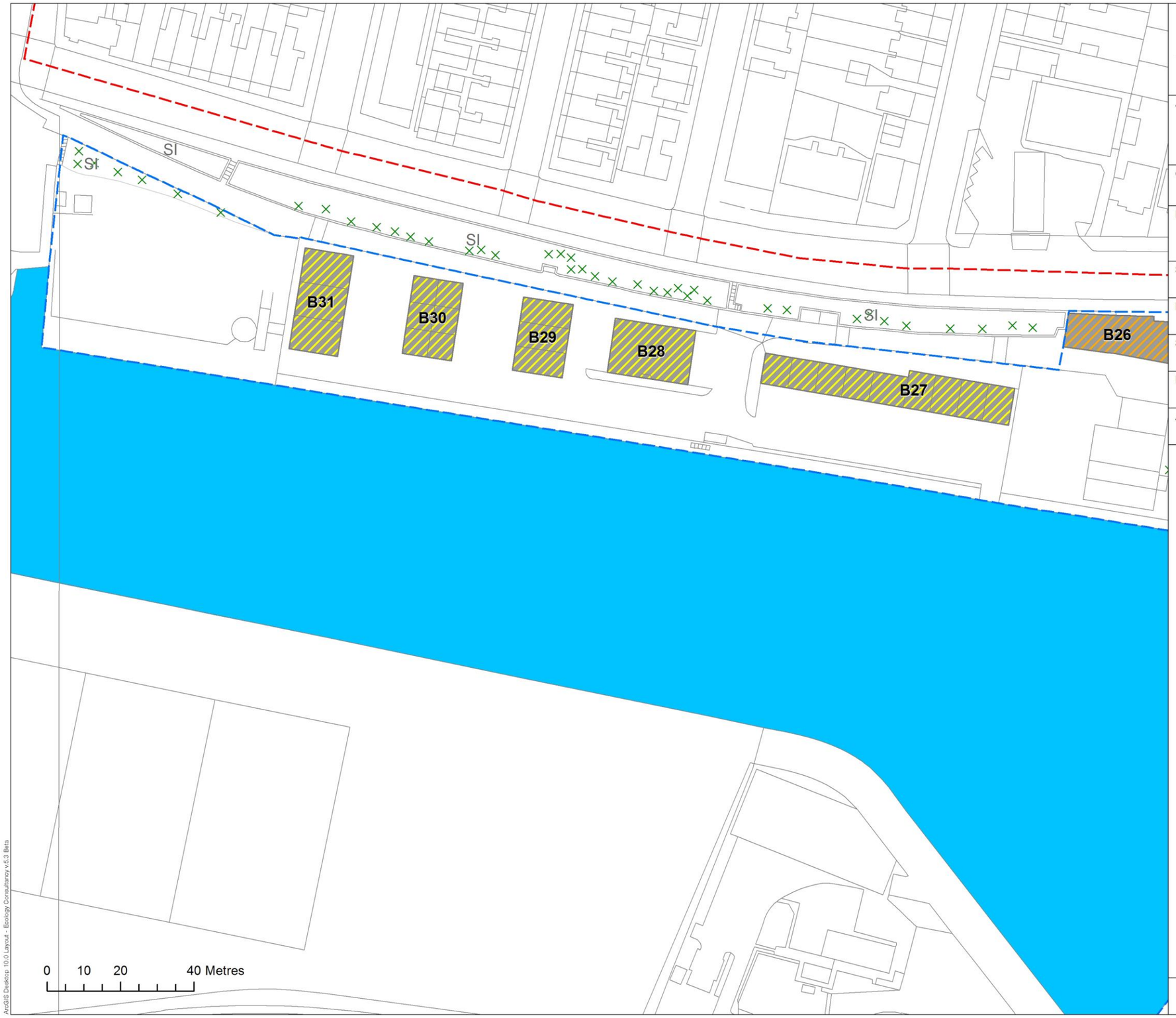
Main enhancement options include changes to grassland management to create daisy lawns (Option B) and/or creation of wildflower areas (Option D). This could include strips of wildflower adjacent to public footpaths and along south and west boundary and on raised banks around skate bowl. Note: the eastern half of the site had not been cut at the time of survey and a colourful daisy lawn with abundant daisy and dandelion was present. The creation of a new species rich native hedgerow along the south boundary should also be considered (Option F) both for providing wildlife value but also as a buffer to noise and pollution from Brighton Road (A259).

The open nature of the site means it provides visual amenity value to premises to the south and offices to the west.


The Ecology Consultancy
Job title
Shoreham Harbour Regeneration
ECL Job no. 3333
Client
Adur District Council
Drawing title
ENHANCEMENT SITES MAP
Section: Site 15
Scale (at A3) 1:800
Date of survey
April 2015
Surveyor
Ben Kimpton
Drawn RM
Checked BK
Approved GC
Date 09/06/2015
KEY
Shoreham Harbour Regeneration Boundary
Strategic Sites Boundary
A
Enhancement Sites and options - see accompanying notes
N
This plan is provided solely for the purpose of supporting the description of the ecological features of the site as contained in the accompanying report
Site 15
C
D
B
E
E
D
F
C
A/F
0
10
20
40 Metres
ArcGIS Desktop 10.0 Layout - Ecology Consultancy v.8.3 Beta
Contains OS Data © Crown copyright [and database right] (2015)

Appendix 3: Bat Assessment and Habitat Survey Maps





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Job title
Shoreham Harbour Regeneration
ECL Job no. 3333

Client
Adur District Council

Drawing title
BAT ASSESSMENT AND HABITAT SURVEY MAP

Section: Strategic Site 1 - B

Scale (at A3) 1:1,000

Date of survey
March 2015

Surveyor
Ben Kimpton

Drawn	Checked
RM	BK

Approved	Date
GC	24/07/2015

KEY

- Shoreham Harbour Regeneration Boundary
- Strategic Sites Boundary
- Bare ground
- Ephemeral/short perennial
- Tall ruderal
- Poor semi-improved grassland (SI)
- Amenity grassland (A)
- Introduced shrub
- Non-native hedgerow
- Scattered scrub
- Scattered trees
- Scattered saltmarsh plants
- Saltmarsh
- Intertidal mud
- Intertidal boulders/ rocks
- Open water
- Building demolished
- Building inaccessible
- Building with high roosting potential
- Building with moderate roosting potential
- Building with low roosting potential
- Building with negligible roosting potential

N

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Job title
Shoreham Harbour Regeneration
ECL Job no. 3333

Client
Adur District Council

Drawing title
BAT ASSESSMENT AND HABITAT SURVEY MAP

Section:	Scale (at A3)
Strategic Site 2 - A	1:1,000

Date of survey
March 2015

Surveyor
Ben Kimpton

Drawn	Checked
RM	BK

Approved	Date
GC	24/07/2015

KEY

- Shoreham Harbour Regeneration Boundary
- Strategic Sites Boundary
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ECL Job no. 3333

Client
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Drawing title
BAT ASSESSMENT AND HABITAT SURVEY MAP

Section:	Scale (at A3)
Strategic Site 2 - B	1:1,000

Date of survey: March 2015

Surveyor: Ben Kimpton

Drawn	Checked
RM	BK

Approved	Date
GC	24/07/2015

KEY

- Shoreham Harbour Regeneration Boundary
- Strategic Sites Boundary
- Bare ground
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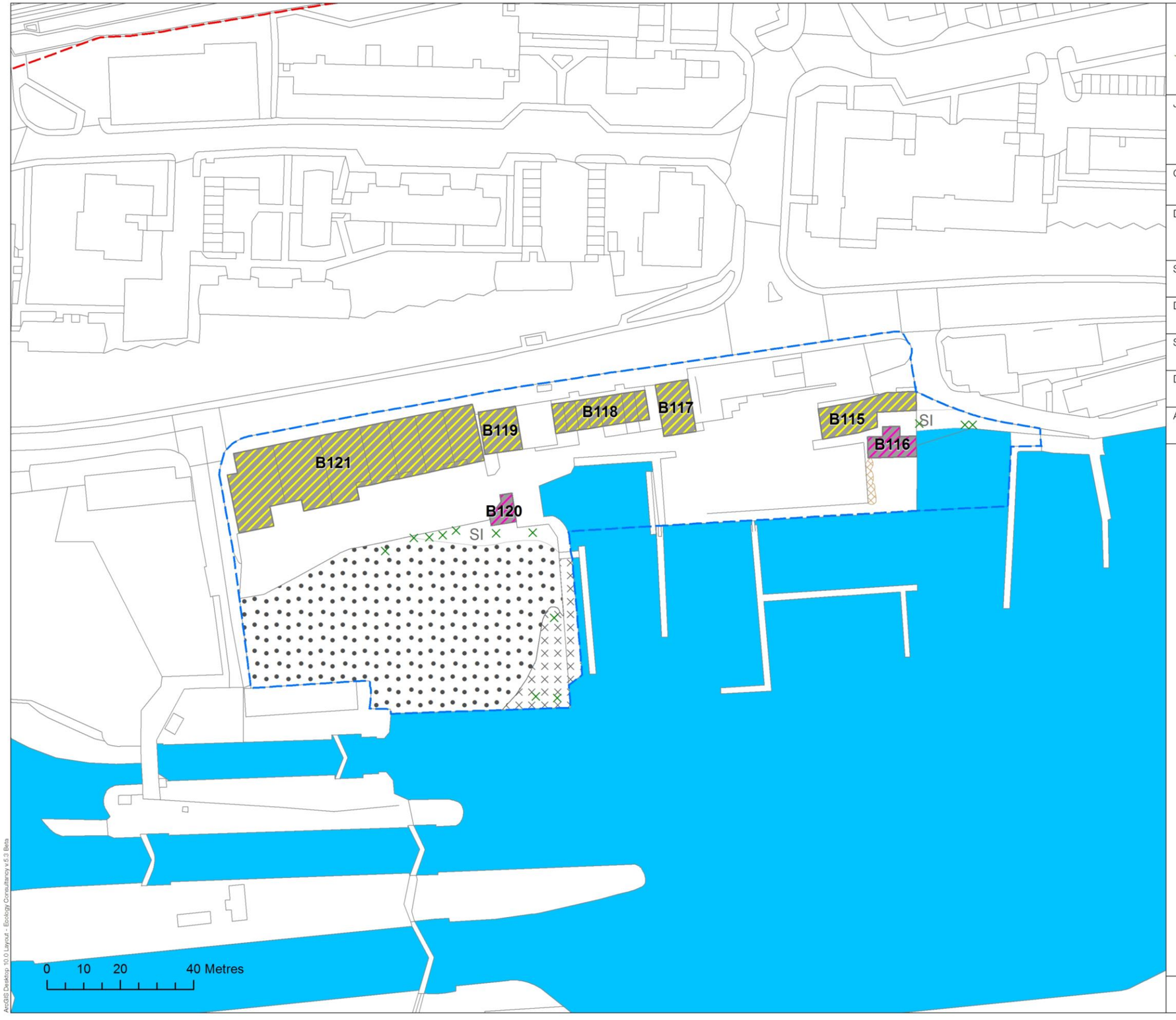

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Job title
Shoreham Harbour Regeneration
ECL Job no. 3333

Client
Adur District Council

Drawing title
BAT ASSESSMENT AND HABITAT SURVEY MAP

Section:	Scale (at A3)
Strategic Site 3	1:1,000

Date of survey: March 2015

Surveyor: Ben Kimpton

Drawn	Checked
RM	BK

Approved	Date
GC	24/07/2015

KEY

- Shoreham Harbour Regeneration Boundary
- Strategic Sites Boundary
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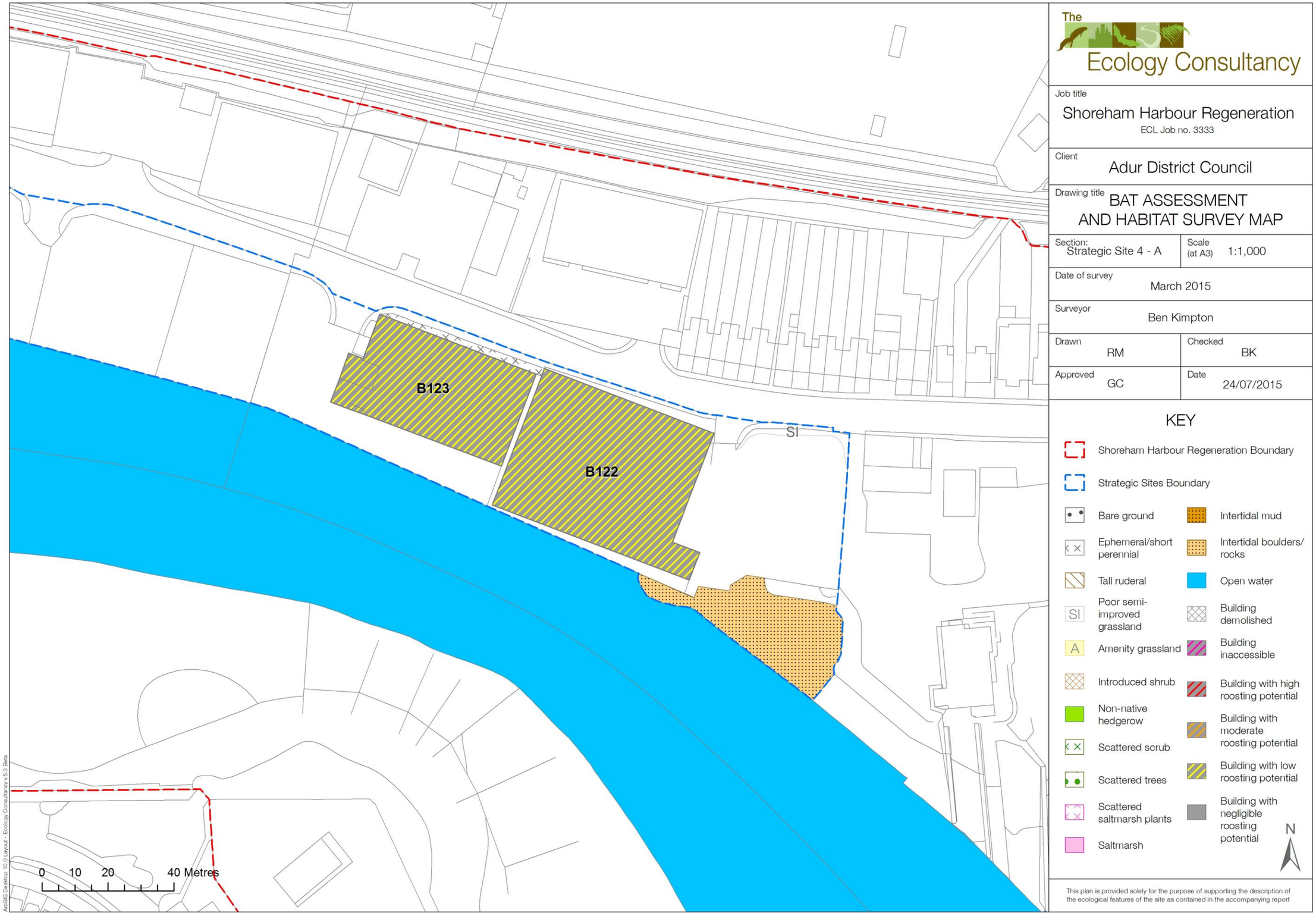

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Job title
Shoreham Harbour Regeneration
ECL Job no. 3333

Client
Adur District Council

Drawing title
BAT ASSESSMENT AND HABITAT SURVEY MAP

Section:	Scale (at A3)
Strategic Site 4 - A	1:1,000

Date of survey: March 2015

Surveyor: Ben Kimpton

Drawn	Checked
RM	BK

Approved	Date
GC	24/07/2015

KEY

- Shoreham Harbour Regeneration Boundary
- Strategic Sites Boundary
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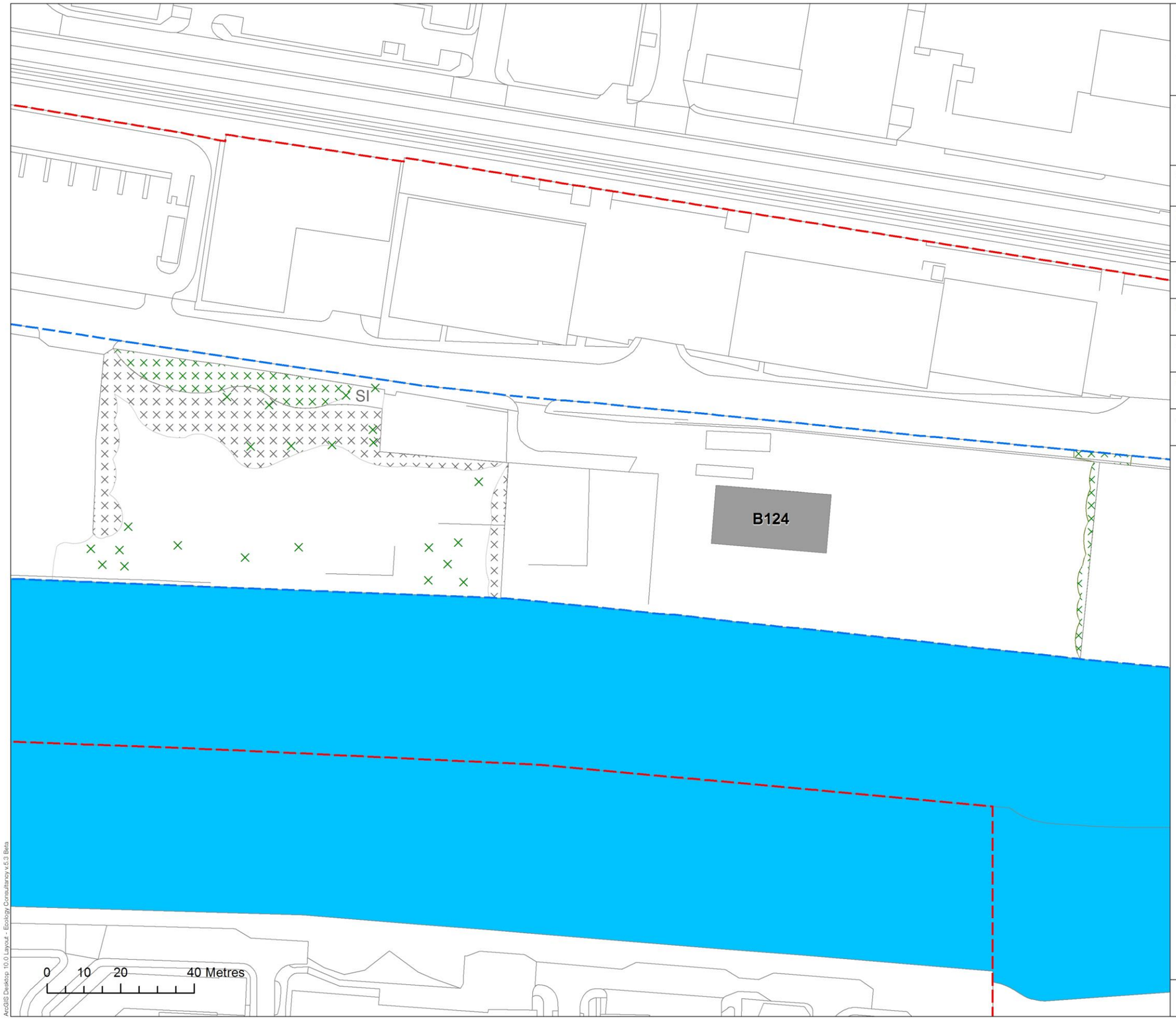

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Job title
Shoreham Harbour Regeneration
ECL Job no. 3333

Client
Adur District Council

Drawing title
BAT ASSESSMENT AND HABITAT SURVEY MAP

Section:	Scale (at A3)
Strategic Site 4 - B	1:1,000

Date of survey: March 2015

Surveyor: Ben Kimpton

Drawn	Checked
RM	BK

Approved	Date
GC	24/07/2015

KEY

- Shoreham Harbour Regeneration Boundary
- Strategic Sites Boundary
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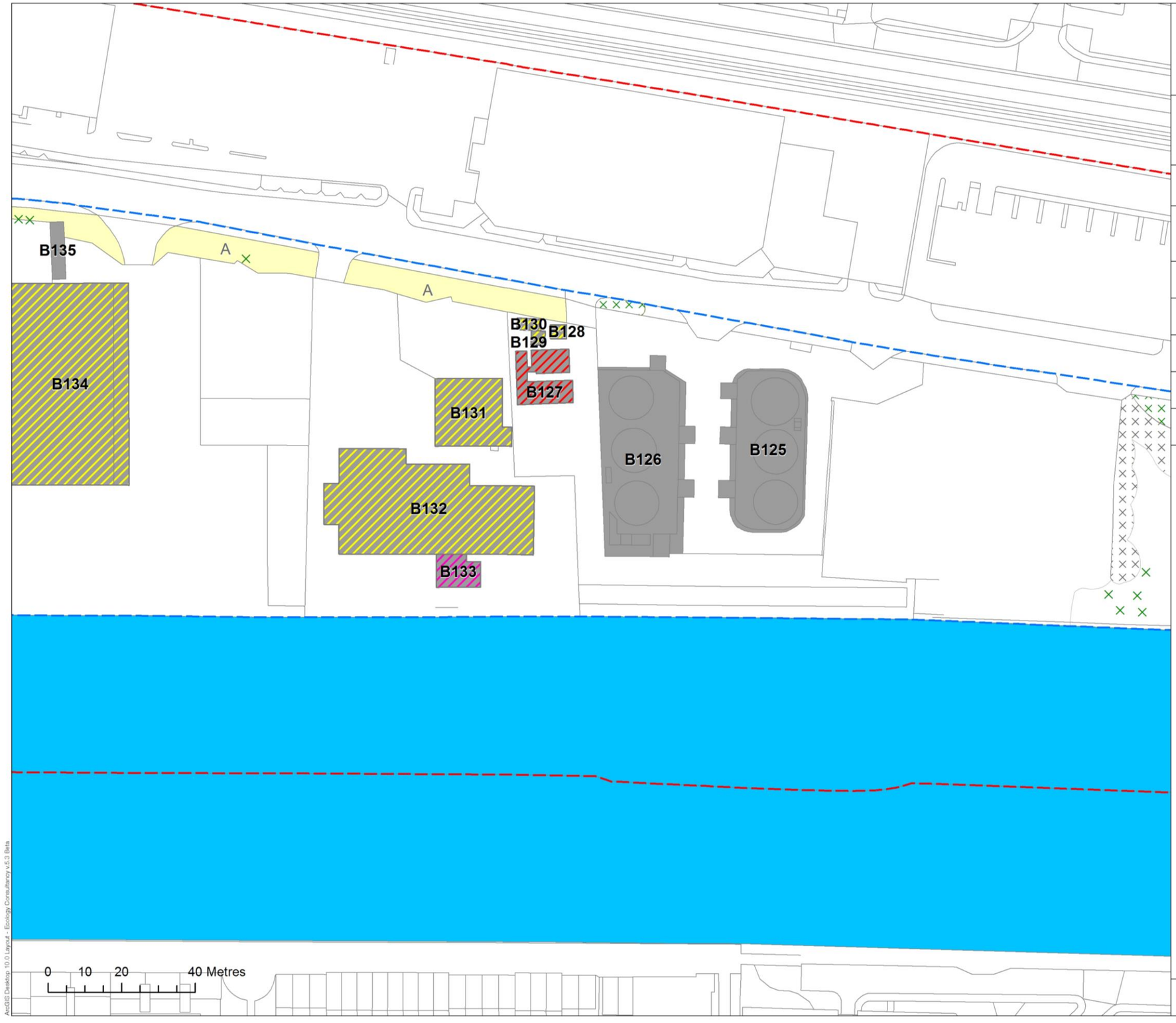
ArcGIS Desktop 10.0 Layout - Ecology Consultancy v.5.3 Beta



The Ecology Consultancy

Job title
Shoreham Harbour Regeneration
ECL Job no. 3333

Client
Adur District Council

Drawing title
BAT ASSESSMENT AND HABITAT SURVEY MAP

Section:	Scale (at A3)
Strategic Site 4 - C	1:1,000

Date of survey: March 2015

Surveyor: Ben Kimpton

Drawn	Checked
RM	BK

Approved	Date
GC	24/07/2015

KEY

- Shoreham Harbour Regeneration Boundary
- Strategic Sites Boundary
- Bare ground
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- Tall ruderal
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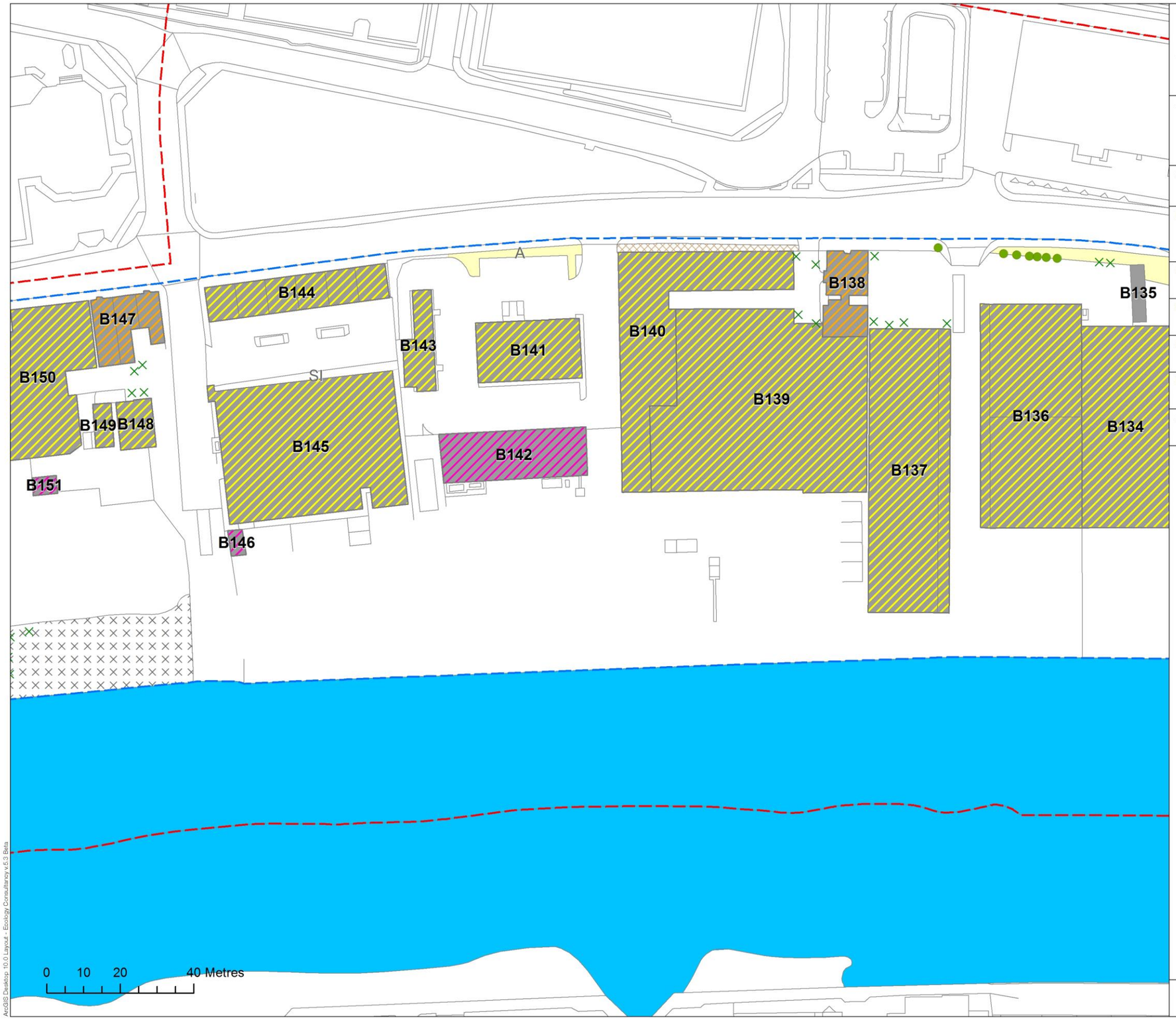

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Job title
Shoreham Harbour Regeneration
ECL Job no. 3333

Client
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Drawing title
BAT ASSESSMENT AND HABITAT SURVEY MAP

Section:	Scale (at A3)
Strategic Site 4 - D	1:1,000

Date of survey: March 2015

Surveyor: Ben Kimpton

Drawn	Checked
RM	BK

Approved	Date
GC	24/07/2015

KEY

- Shoreham Harbour Regeneration Boundary
- Strategic Sites Boundary
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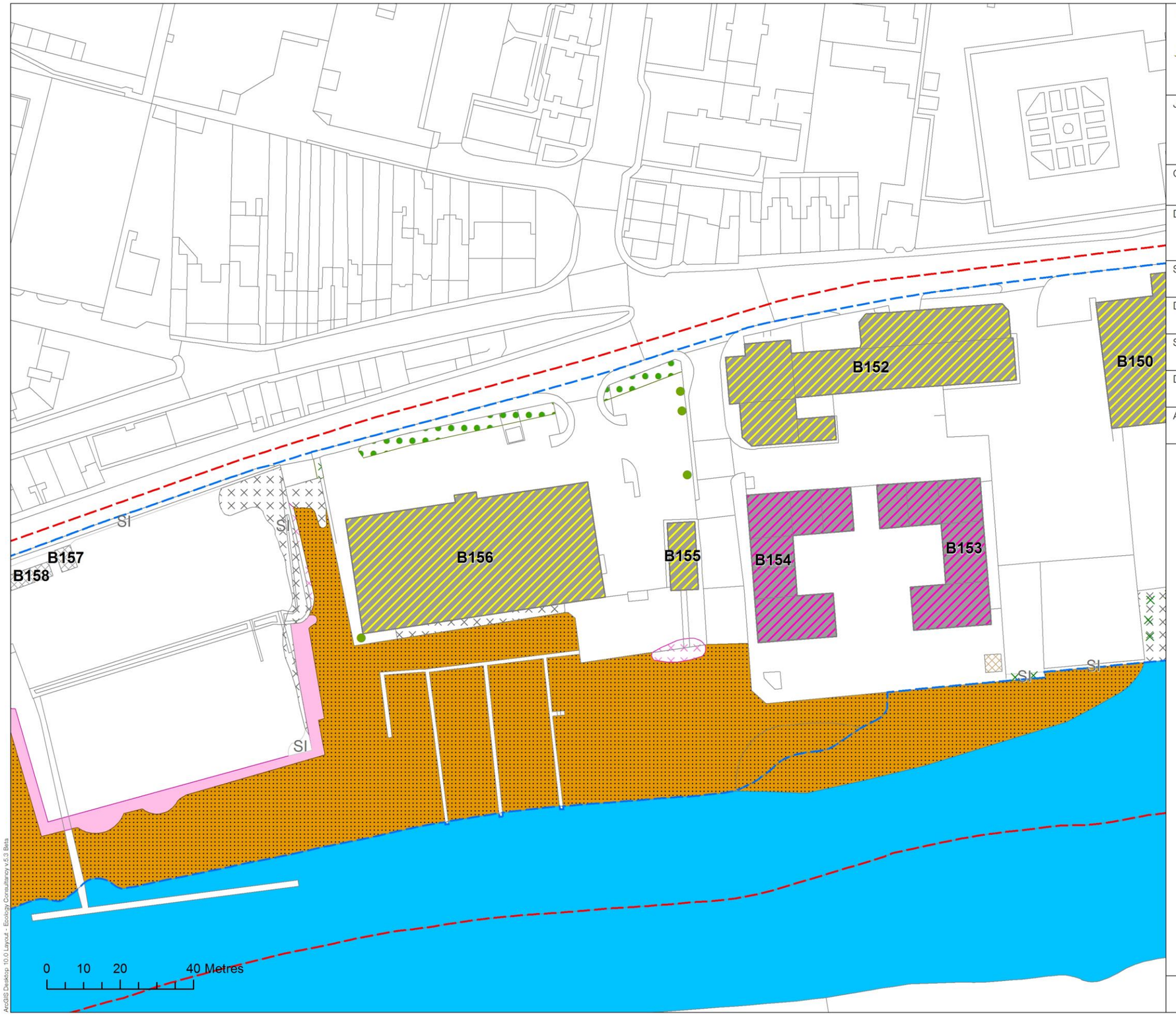

The Ecology Consultancy

Job title
Shoreham Harbour Regeneration
ECL Job no. 3333

Client
Adur District Council

Drawing title
BAT ASSESSMENT AND HABITAT SURVEY MAP

Section:	Scale (at A3)
Strategic Site 4 - E	1:1,000

Date of survey: March 2015

Surveyor: Ben Kimpton

Drawn	Checked
RM	BK

Approved	Date
GC	24/07/2015

KEY

- Shoreham Harbour Regeneration Boundary
- Strategic Sites Boundary
- Bare ground
- Ephemeral/short perennial
- Tall ruderal
- SI Poor semi-improved grassland
- A Amenity grassland
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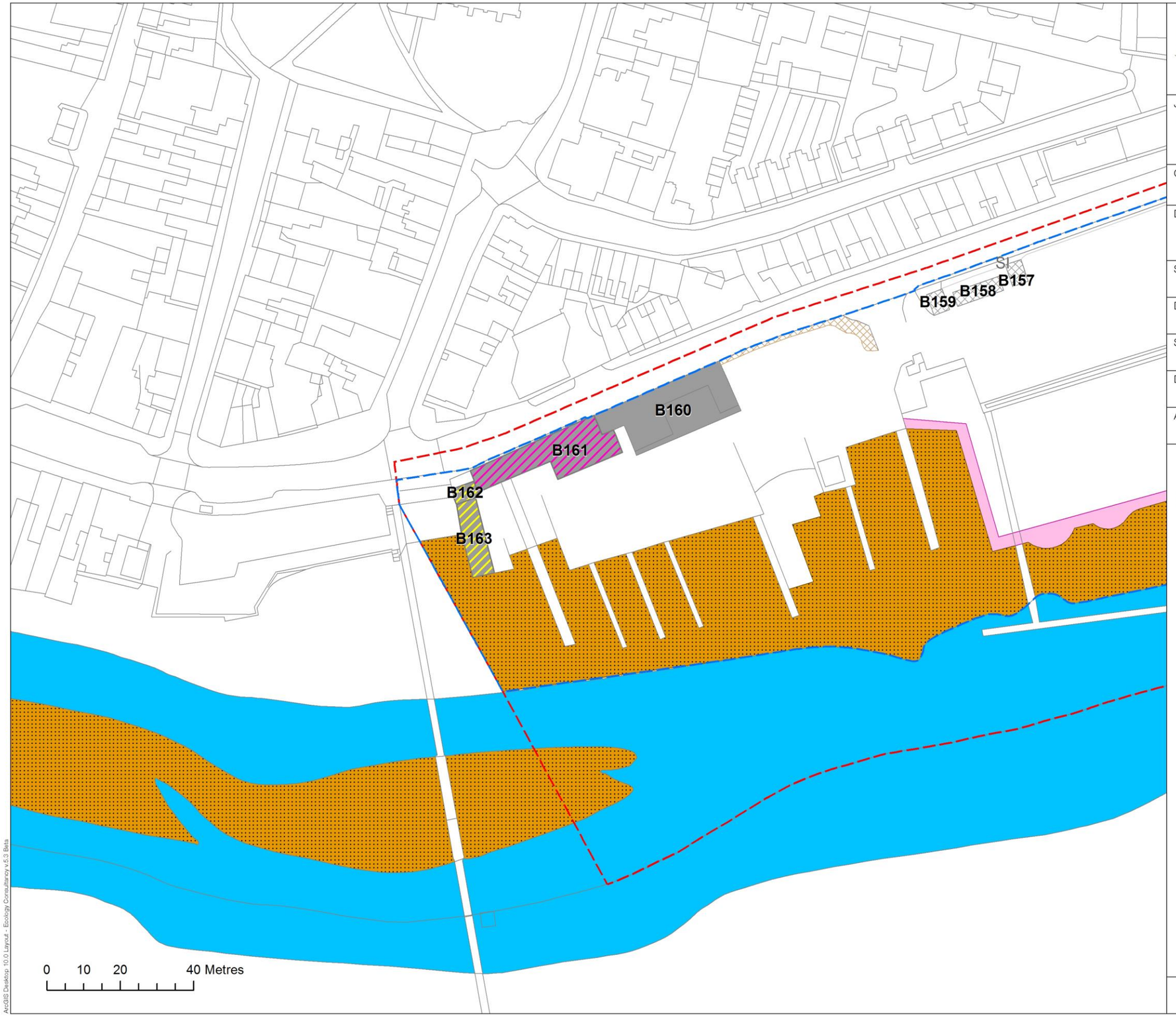

The Ecology Consultancy

Job title
Shoreham Harbour Regeneration
ECL Job no. 3333

Client
Adur District Council

Drawing title
BAT ASSESSMENT AND HABITAT SURVEY MAP

Section:	Scale (at A3)
Strategic Site 4 - F	1:1,000

Date of survey: March 2015

Surveyor: Ben Kimpton

Drawn	Checked
RM	BK

Approved	Date
GC	24/07/2015

KEY

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N

This plan is provided solely for the purpose of supporting the description of the ecological features of the site as contained in the accompanying report

Appendix 4: Bat Assessment Table

Building Reference Number	Building Description	Features for Bats	Potential
Shoreham Port: Aldrington Basin, Portslade (Map 1)			
1	Pre-fabricated metal warehouse, pitched corrugated metal roof with numerous gaps.	No obvious features.	Negligible
2	Quayside House: Modern pre-fabricated warehouse. Flat metal roof.	No obvious features.	Negligible
3	Quayside offices: Two storey, red brick, 1960s office block, flat roof. Pre-fabricated fascia panels on the north and southern elevations. Gaps between the timber window casement frames and under the asbestos soffit box north and southern elevations.	Numerous gaps in the pre-fabricated panels. Gaps under the asbestos soffits box.	Moderate
4	Pre-fabricated metal warehouse, pitched corrugated metal roof with numerous gaps.	No obvious features.	Negligible
5	Virgin Media warehouse, smooth concrete flat corrugated asbestos roof. UPVC windows. Metal cladding present on the north facing elevation of the structure.	No obvious features.	Negligible
6	Pre-fabricated metal warehouse, pitched corrugated metal roof with numerous gaps.	Narrow gap between the metal cladding.	Low
7	Pre-fabricated metal warehouse, pitched corrugated metal roof with numerous gaps.	No obvious features.	Negligible
8	Brighton Carriers: Modern two storey brick structure with vertical metal cladding, corrugated metal roof.	No obvious features.	Negligible
9	Pre-fabricated electrical substation.	No obvious features.	Negligible
10	No visual access gained to enable an assessment.	Not known.	Not known
11	2 storey 1970s brick structure under construction at the time of the survey.	Due to the removal of roof.	Negligible
	Pitched tiled roof completed removed exposing upper storey.	If pitched tiled roof present.	Moderate
12	Fish metal warehouse, pre-fabricated structure with pitched roof.	No obvious features.	Negligible
13	2 storey timber 1970s structure, flat timber roof.	Numerous gaps between the timbers.	Moderate
14	Beechwood Timber: Pre-fabricated corrugated metal warehouse. Pitched metal roof.	None.	Negligible
15	Britannia House, two storey red brick 1970s former office block. Flat concrete roof. Multiple broken windows.	Gaps in between timber/pre-fabricated panels.	Low
16	2 storey brick structure rendered with smooth concrete.	Gaps under timber fascias.	Low
17	Beachwood Timber: Pre-fabricated corrugated metal warehouse, with vertical timber weatherboard. Pitched corrugated asbestos roof with skylights.	Gaps between timber weatherboard.	Low
18	Pre-fabricated corrugated metal warehouse. Pitched metal roof. Asbestos guttering present on east elevation.	None.	Negligible
19	Magnet Depot, brick single storey, flat corrugated asbestos roof. Metal shutter door.	Gaps under corrugated asbestos roof and around timber doorframe.	Low
20	Pre-fabricated corrugated metal warehouse. Pitched metal roof. Timber plank present upon the rear elevation of the structure and gaps behind a metal down pipe.	Gaps under the timber plank on the rear elevation.	Low
21	Adams cash and carry, single storey, pre-fabricated metal warehouse.	None.	Negligible
22	Two storey concrete block warehouse, with a smooth painted render finish. Timber weatherboard present upon the east elevation. Pitched asbestos roof with numerous gaps.	Gaps under corrugated asbestos roof and timber weatherboard.	Low
23	Pets Corner, two storey 1960s brick structure with flat concrete roof. Car repair workshops located upon the lower rear storey with metal roller shutter doors.	Gaps under the timber soffits.	Low
24	Three storey 1960s office block, constructed of brick and rendered with pebbledash. Flat concrete roof. Asbestos facia panels present upon the rear elevation.	Gaps between the asbestos facia panels.	Low
25	Three storey 1970s brick structure, timber weatherboard present on the rear elevation.	Gaps under timber weatherboard and around the timber window casements.	Low
26	Surf Shop: Brick two storeys, timber weatherboard present upon the rear elevation of the buildings. Pitched tiled roofs and likely to support internal roof voids.	Gaps under timber weatherboard and internal roof void potentially present.	Moderate

Building Reference Number	Building Description	Features for Bats	Potential
The Canal East Arm: Map 2			
27	1970s red brick single storey warehouse. Flat metal roof.	Narrow gap between the roof overlap and the top of the brickwork.	Low
28	Hove Enterprise Centre: Two storey modern office block constructed of brick and supports a pitched metal pre-fabricated roof.	Gaps present under the timber soffits and fascias.	Low
29	Modern single storey brick structure with pitched pre-fabricated roof.	Narrow gap present between the joins on the pre-fabricated roof at the gable apex east elevation.	Low
30	Modern single storey brick structure with pitched pre-fabricated roof.	Narrow gap present between the joins on the pre-fabricated roof at the gable apex east elevation.	Low
31	Modern single storey brick structure with pitched pre-fabricated roof.	Narrow gap present between the joins on the pre-fabricated roof at the gable apex east elevation.	Low

Building Reference Number	Building Description	Features for Bats	Potential
Portslade Industrial Estate: Map 3			
32	Commercial premises located on the corner of Wellington Road and Station Road, two storey Victorian (former public house), pitched tiled roof with internal roof void. Building constructed of brick with a smooth render finish. Located on a busy road with no connectivity to natural features.	Potential gaps under roof tiles.	Moderate
33	Single storey Victorian outbuilding. Constructed of brick with a smooth render finish. Pitched tiled roof. Located on a busy road with no connectivity to natural features.	Potential gaps under the roof tiles.	Low
34	Two storey Victorian commercial property. Pitched tiled roof with internal roof void. Constructed of brick and finished with smooth render. Located on a busy road with no connectivity to natural features.	Potential gaps under the roof tiles.	Low
35	Two storey Victorian commercial property. Pitched tiled roof with internal roof void. Constructed of brick and finished with smooth render. Located on a busy road with no connectivity to natural features.	Potential gaps under the roof tiles.	Low
36	Two storey Victorian commercial property. Pitched tiled roof with internal roof void. Constructed of brick and finished with smooth render. Located on a busy road with no connectivity to natural features.	Potential gaps under the roof tiles.	Low
37	Two storey Victorian commercial property. Pitched tiled roof with internal roof void. Constructed of brick and finished with smooth render. Located on a busy road with no connectivity to natural features. Located on a busy road with no connectivity to natural features.	Potential gaps under the roof tiles.	Low
38 -39	Blue Anchor public house. Two storey Victorian brick property the upper storey finished with smooth render. Pitched tiled roof with internal roof void. Hanging tiles present on two western facing gable ends adjacent to Station Road. Located on a busy road with no connectivity to natural features.	Potential gaps under the roof tiles.	Low
40	Fast Food Café. Two storey Victorian structure. Pitched tiled roof and internal roof void. Located on a busy road with no connectivity to natural features.	Potential gaps under the roof tiles.	Low
41	Two storey Victorian residential dwelling. Constructed of brick with a smooth render finish. Pitched tiled roof. Located on a busy road with no connectivity to natural features.	Potential gaps under the roof tiles.	Low
42	Two storey Victorian residential dwelling. Constructed of brick with a pebbledash render finish. Pitched tiled roof. Located on a busy road with no connectivity to natural features.	Potential gaps under the roof tiles.	Low
43	Two storey Victorian residential dwelling. Constructed of brick with a pebbledash render finish. Pitched tiled roof. Located on a busy road with no connectivity to natural features.	Potential gaps under the roof tiles.	Low
44	Two storey Victorian residential dwelling. Constructed of brick with a pebbledash render finish. Pitched tiled roof. Located on a busy road with no connectivity to natural features.	Potential gaps under the roof tiles.	Low
45	Two storey Victorian residential dwelling. Constructed of brick with a pebbledash render finish. Pitched tiled roof. Located on a busy road with no connectivity to natural features.	Potential gaps under the roof tiles.	Low
46	Single storey brick structure finished with smooth render. Flat asphalt roof. Timber facia present on the north facing elevation. Located on a busy road with no connectivity to natural features.	Potential gaps under the timber fascia.	Low
47	Three storey 1970s brick structure. Lower floor currently in use as a diner upper storeys in use as residential flats. The north facing elevation comprises a smooth tile and render finish. Flat asphalt roof. Timber facia is present on the north elevation. Located on a busy road with no connectivity to natural features.	Potential gaps under the timber facia and around the timber window casements.	Low
48	Two storey Victorian residential dwelling. Constructed of brick and finished with a concrete painted render. Pitched tiled roof and internal roof void. Located on a busy road with no connectivity to natural features.	Potential gaps under the roof tiles.	Low
49	Two storey former red brick factory circa 1900s, currently in use as a car MOT workshop and dance studio. Corrugated asbestos roof. Timber fascia's present upon the north, east and south elevations of the building. Vertical corrugated cladding present upon the east elevation. Timber window frames present on the north, east and south elevations.	Gaps –present under the corrugated asbestos roof and vertical cladding, timber fascia and timber window frames.	Moderate
50	Sussex Asphalt single storey brick structure circa 1970s. Flat asphalt roof. Timber facia present on the west elevation.	Potential gaps present under the timber facia.	Low
51	Electrical substation infrastructure. Low level metal electrical units.	None.	Negligible
52	Single storey pre-fabricated porta cabin with a flat roof.	None.	Negligible
	Single storey flat roof garage constructed of concrete blockwork. Rotted timber facia present upon the south elevation.	Gaps under the timber facia, southern elevation.	Low
53	Lansdown House: Two storey 1970s brick structure. Flat roof concrete roof. Likely to support cavity walls.	Potential for gaps between the brickwork mortar, providing access into cavity walls.	Low
54	Belgrave Centre: Two storey 1900s brick structure, comprising multiple extension of levels on the rear elevation. Corrugated asbestos roof on the front (southern elevation). Pitched metal roof and flat asphalt roof on the north elevation (rear). Timber soffits and fascia's present on the north, south, east and west elevations.	Gaps under the corrugated asbestos roof and potential gaps under the timber soffits and fascias.	Low
55	Two storey 1970s brick structure currently in use as a day care or educational facility. Pitched pre-fabricated finished roof. Vertical pre-fabricated panel present of the southern elevation of the structure. Timber fascias are present on the east elevation of the building.	Gaps under rotted timber fascias.	Low
56	Single storey 'Tyler' blockwork workshop. Pitched corrugated asbestos roof and vertical corrugated asbestos panels present upon the east elevation.	Gaps under the corrugated asbestos.	Low
57	Wellington House: Pre-fabricated modern two storey industrial unit currently in use as offices by auto windscreens. Vertical metal cladding	None.	Negligible

	present on the southern elevation. Pitched metal roof.		
58	Two storey, brick 1970s warehouse with a corrugated asbestos roof. Modern windows are present on the east elevation.	Gaps present under the corrugated asbestos.	Low
59	Two storey 1970s industrial workshop/offices, constructed of brick. The structure support timber framed windows and prefabricated panels on the west elevation of the building. Pebbledash render is present on the southern elevation of the structure.	Potential gaps under the pre-fabricated panel and around the window frames.	Low
60	Two storey Victorian commercial property (lower storey) and residential flats (upper storey). Pitched tiled roof with internal roof voids. Located on a busy urban junction with no connectivity to natural landscapes.	Numerous gaps under the shop signage board and potentially under the roofing tiles.	Low
61	Two storey Victorian commercial property (lower storey) and residential flats (upper storey). Pitched tiled roofs with internal roof voids. Shop signage boards are missing exposing cavities. Rotted timber fascias are present on the southern elevation. Located on a busy urban junction with no connectivity to natural landscapes.	Numerous gaps under the timber fascia's, under the shop signage board and potentially under the roofing tiles.	Low
62 -70	A row of ten Victorian two storey residential terraced houses. Pitched tiled roofs and likely to support internal roof voids which may or may not have been converted into living accommodation. The structures are constructed of brick and painted white. The windows comprise a mix of traditional timber sash and modern UPVC materials. Mature trees and shrubs are present in the rear gardens of the properties.	Potential gaps under the roof tiles and around the window frames.	Moderate
71	Single storey brick car workshop circa 1900s. The pitched roof comprises corrugated asbestos. The east elevation comprises modern open fronted roller shutter doors and windows and a large area of traditional hanging tiles. The structure is located to the north east of mature gardens.	Gaps under the hanging tiles and corrugated asbestos.	Moderate
72	No visual access.	Not known.	Not known
73	No visual access.	Not known.	Not known
74	Two storey brick industrial unit circa 1970s. Corrugated asbestos roof. Warped pre-fabricated panels and a timber facia is present on the southern elevation of the structure.	Gaps under the corrugated asbestos roof and around the pre-fabricated panels.	Low
75	Single storey red brick warehouse circa 1900s with a modern pitched metal roof. Two timber framed windows and two metal roller shutter doors are present on the west elevation.	Gaps between the brickwork mortar.	Low
76	Two storey brick structure circa 1970s. Currently in use an engraving works and funeral services. Flat concrete roof. Timber framed windows are present. The southern elevation is constructed on supports with a car port located below.	Potential gaps within the brickwork mortar and around the timber window frames.	Low
77	Three storey brick 1960s structure, located on the corner of George Street, currently in use as a church. Flat concrete roof. Pre-fabricated panels are present under the timber window frames. A roller shutter door is present on the west elevation of the building.	Gaps under the pre-fabricated panels on southern elevation.	Low
78	Red brick two and three storey industrial unit and associated offices. Circa 1960s. Supports a flat concrete roof. Pre-fabricated panels are present on the southern (front elevation) of the building. The window frames are constructed of timber. A porch is present on the southern elevation (above the entrance to electrical offices) and supports a flat asphalt roof and lead flashing.	Gaps under lead flashing present upon a porch on the southern elevation.	Low
79	Two storey industrial warehouse/office unit currently in use by VW. The structure is constructed of concrete blockwork and painted with a smooth finish. The building supports a pitched corrugated asbestos roof.	Gaps under the corrugated asbestos roof.	Low
80	Four storey red brick industrial unit, located on the corner of George Street. Pitched pre-fabricated roof present within dormer windows located on the rear elevation (north). Slate hanging tiles are present on the dormer windows. The window frames are constructed of timber and concrete lintels are located above the windows above the windows on the north elevation.	Potential gaps under the hanging tiles, concrete window lintels and window frames.	Low
81	Two storey 1970s industrial unit, constructed of brick, circa 1970s. . Flat concrete roof. Timber framed windows are present on the southern elevation of the building. A timber facia is present on the north elevation of the building. Concrete sections are present between the brickwork on the north elevation.	Potential gaps under the timber fascia's and around the concrete lintel sections.	Low
82	Two storey circa 1960s factory. Flat concrete/asbestos roof with an overlap present on the east elevation of the structure. Numerous gaps between the brickwork mortar on the east elevation. A steel roller shutter door and timber framed windows are present on the north elevation	Gaps between the brickwork mortar east elevation. Potential gaps between the timber window frames.	Low
83	U Shaped, two storey 1970s industrial unit and associated offices constructed of brick and located on the corner of West Street, Portslade. Flat asphalt roof. Pre-fabricated panel (potentially asbestos) are present on all four elevations of the structure. Timber framed windows are present on the lower and upper storeys of the building.	Gaps under the pre-fabricated asbestos panel (all elevations). Gaps between the brickwork mortar.	Low
84	Two storey Victorian structure currently in use as a public house. Large pitched tiled roof. Timber soffits and window frames present.	Potential gaps under the roof tiles and timber soffits and windows.	Low
85	Large red brick 1960s former factory currently disused. The structure supports a pitched corrugated asbestos roof which is obscured behind a front (north facing) façade. The building supports numerous broken windows. Timber fascia's are present on the east and west elevation of the building A single storey extension circa 1970s is present on the west elevation. Supporting a pitched metal roof and vertical corrugated metal cladding. A second single storey factory is present on the north elevation and supports a pitched corrugated asbestos roof.	Gaps between brickwork mortar and where walls have been subject to partial collapse. Gaps through the windows and under timber fascia's, corrugated asbestos and vertical cladding.	Low
86	Two storey Victorian commercial premises currently in use as a testing laboratory. Pitched tiled roof with an internal roof void. Devoid of a soffit box on east and west elevations. Constructed of brick and finished with smooth render. A steel roller shutter door and modern timber framed windows are present on the front (north elevation) of the structure.	Potential gaps under the roof tiles.	Low
87	Two storey Victorian structure currently in use as a bathroom fitting showroom (lower storey) and residential flats (upper storey). Constructed of brick and finished on the north elevation with peddledash. Pitched tiled roof. Timber fascias are present on the north and south elevations. Sash timber window frames are present on the north elevation. Located within an urban industrial location with no direct connectivity top natural features.	Gaps under the timber fascia's north and south elevations. Potential gaps under the roof tiles. Potential gaps around the window frames.	Low
88	Three storey 1970s structure currently in use as commercial offices. Constructed of brick and concrete blockwork (rear, north elevation) likely to support cavity walls. Flat asbestos roof. Pre-fabricated cladding is present on the south and west elevations of the building. Corrugated	Gaps under the corrugated concrete/asbestos cladding west elevation.	Low

	asbestos concrete cladding is also present at the gable end on the west elevation of the structure. The building is located within an urban industrial location and is not connected to natural features.	Gaps under the pre-fabricated cladding on the south elevation.	
89	Concrete block warehouse circa 1970s. Supports a pitched corrugated asbestos roof. Currently in use as timber storage facility. The building is located within an urban industrial location and is not connected to natural features.	Numerous gaps under the corrugated asbestos roof. Potential gaps between the concrete structural supports.	Low
90	Two storey 1970s industrial unit. Constructed of brick with a pitched metal pre-fabricated roof.	None.	Negligible
91	Pre-fabricated metal modern industrial warehouse currently in use as building merchants supplier. Corrugated metal walls and pitched metal roof.	None.	Negligible

Building Reference Number	Building Description	Features for Bats	Potential
Portslade Industrial Estate: Map 4			
92	Two storey 1970s brick industrial unit/office block. Flat concrete and asphalt roof. Pre-fabricated asbestos fascias are present on all four elevations.	Gaps under the asphalt roofing membrane and asbestos fascias	Low
93	Two storey brick circa early 1970s warehouse currently in use as a fireplace showroom. Supports a pitched corrugated asbestos roof. The building comprises a rotted timber facia on the southern elevation of the structure. Vale Park recreation ground is located approximately 150m north of the building.	Gap at the western gable end. Gaps under corrugated asbestos roof. Potential gaps within the brickwork mortar.	Low
94	Two storey modern concrete and metal industrial warehouse. Supports a pitched metal roof and vertical corrugated metal cladding. The brickwork is covered in a smooth render. A metal concertina door is present on the southern elevation of the building.	Gaps under the vertical metal cladding.	Negligible
95	Two storey modern industrial unit with associated offices. Constructed of brick and supports a flat metal roof, metal framed windows and vertical metal cladding.	None.	Negligible
96	Two storey brick modern industrial unit. Pitched tiled roof. And internal roof void likely to be present. Timber soffits.	Potential gaps under the roof tiles and soffits.	Low
97	Two storey Victorian residential dwelling may have been converted for commercial purposes. Pitched tiled roof with roof ventilation tiles present. The structure is constructed of brick and finished with a painted render. The render has cracked in several places. The window frames are constructed of timber. The structure is located on a busy junction and has no connecting to natural features.	Potential gaps under the roofing tiles and beneath the cracked render.	Low
98	Single storey large industrial unit with a pitch asbestos roof.	Gaps under the asbestos roof.	Low
99 100	No visual access to enable an assessment of these structures.	Not known.	Not known
101	Two storey Victorian structure with a pitched slate roof. Tightly sealed soffits present on the north elevation. The building is constructed of brick and finished with smooth painted render.	Potential gaps under the roof tiles.	Low
	Single storey brick structure (garage/outbuilding) supports a flat asphalt roof.	Potential gaps under the roof and timber fascias.	Low
	Two storey structure with a pitched tiled roof (limited visual access).	Potential gapes under the roofing features.	Low
102	2 x two storey Victorian former residential structures currently not in use. Both building support pitched tiled roofs and internal roof voids. The buildings are constructed of brick and finished with render which is cracked and flaking in places on all elevations. Timber fascias are present on the north and southern elevations.	Gaps under the roofing tiles, timber soffits and under the cracked render.	Low
103	Single storey warehouse circa early 1900s. Constructed of brick and supports a pitched slate roof. Two large timber doors are present on the west elevation of the building.	Potential gaps within the brickwork mortar.	Low
104	Single storey Victorian red brick (former school/church) structure currently in use as an ornamental supplier. Structure supports a pitched slate roof and timber framed windows.	Potential gaps around the window frames and under the roof tiles.	Low
105	Metal works fabricators. Single storey factory and associated offices units. 1970s flat concrete roof on the southern extension and pitched corrugated asbestos roofs on the factory units located to the north of the plot.	Gaps under the asbestos roof and potentially between the brickwork mortar.	Low
106	Rounded brick industrial units circa 1970s. The roof comprises pre-fabricated material and overlaps two curved windows.	Gaps under the pre-fabricated window frames.	Low
107	Two storey industrial unit constructed of brick and finished with smooth painted render. Pitched corrugated asbestos roof.	Gaps under the asbestos roof.	Low
108	Three storey industrial unit and associated offices circa 1960s with a flat corrugated asbestos roof. The structure supports pre-fabricated panels on the south and western elevation of the structure. Vertical metal cladding is present on the west elevation of the building.	Gaps under the corrugated asbestos and vertical cladding and beneath pre-fabricated panel.	Low
109	No visual assessment undertaken.	Not known.	Not known
110	No visual assessment undertaken.	Not known.	Not known
111	St Peters Community School, single storey brick structure with three gable on the north elevation. The brick works is partially covered in pebbledash render in places. The structure supports a multi pitched tiles roof. A single storey flat roof extension building is located to the east of the main building. Timber black painted fascias are present on the north of the main gable and newer extension building. The school is located within a residential location and is likely to connect to residential dwellings with mature gardens.	Gaps under the roof tiles, timber fascias.	Moderate
112	No visual assessment undertaken.	Not known.	Not known
113	Two storey modern brick and pre-fabricated metal structure with a pitched metal roof. Metal window frames appeared to be tightly sealed.	None.	Negligible
114	Two storey modern retail unit, currently in use a bed showroom. The walls are constructed of brick and the walls are partially cover with a pre-fabricated cladding. The roof is constructed of pre-fabricated materials.	None.	Negligible

Building Reference Number	Building Description	Features for Bats	Potential
Shoreham Harbour: Map 5			
115	4 x single storey retail units, constructed of brick and a smooth render finish. 4 x pitched tiled roofs. Adjacent to harbour.	Potential gaps under the roof tiles.	Low
116	Pebbles on the Port café, no visual assess to enable an assessment.	Not known.	Not known
117	Three storey built structure currently in use as a print shop and taxi rank, circa 1970s. Constructed of brick and finished with a smooth white painted render. Timber framed windows. Flat asphalt roof.	Potential gaps within the render.	Low
118	Single storey building currently disused and boarded up. Constructed of brick and finished with smooth painted render. Comprises four gables with timber weatherboard present on the upper section of each gable on the north elevation. Pitched slate roofs with numerous tiles missing.	Gaps present under the roof slates and potential gaps under the weatherboard.	Low
119	Two storey circa 1970s retail unit currently in use as a motor cycle shop. Constructed of brick and finished with a smooth painted render. Flat asphalt roof. Timber framed windows.	Potential gaps around the window frames.	Low
120	No visual access to enable an assessment.	Not known.	Not known
121	Single storey brick circa 1970s industrial units. Pitched corrugated metal roofs. Windows frames constructed of UPVC and timber.	Potential gaps within the brickwork mortar.	Low

Building Reference Number	Building Description	Features for Bats	Potential
Shoreham Harbour: Map 6			
122	Single storey corrugated metal industrial storage unit. Pitched corrugated asbestos roof. Wooden signage boards present on the corrugated walls.	Gaps beneath the signage boards. Gaps under the corrugated asbestos.	Low
123	Single storey brick industrial unit, circa 1990s. Currently in use as a building suppliers. Vertical corrugated metal cladding present on part of the structure. Flat corrugated metal roof.	Gaps present between the brick and corrugated metal cladding.	Low

Building Reference Number	Building Description	Features for Bats	Potential
Shoreham Harbour: Map 7			
124	Single storey pre-fabricated metal industrial unit, circa 1990s. Currently in use as a scrap metal facility.	None.	Negligible

Building Reference Number	Building Description	Features for Bats	Potential
Lennards Wharf: Map 8			
125 - 126	6 x galvanised metal large circular storage tanks/vats forms part of Shoreham Depot.	None.	Negligible
127	Two storey brick former residential dwelling circa 1930s, currently forms part of the electrical substation site. Large pitched tiled roof and likely to support an internal roof void. Hanging tiles are present on the north elevation of the structure. Timber window frames. The structure is adjacent to the River Adur.	Gaps under the roofing features. Gaps under the hanging tiles. Potential gaps around the window frames.	High
128 -130	3 x single storey garages/outbuildings. Constructed of brick and finished with a smooth painted render. Pitched corrugated asbestos roof. Wooden weatherboard present east elevation of one of the structures.	Gaps under the timber weatherboard and corrugated asbestos roof.	Low
131	Single storey industrial unit, currently in use as a fruit distributor. Constructed of blockwork and partially cover with vertical corrugated metal cladding. Comprises a corrugated asbestos roof. Lies adjacent to the River Adur.	Gaps under the corrugated asbestos and vertical metal cladding.	Low
132	Single storey large industrial unit, currently in use as a fish distributor. Constructed of brick and comprises vertical corrugated asbestos cladding on the north and southern elevation. Comprises a pitched corrugated asbestos roof. Lies adjacent to the River Adur.	Gaps under the corrugated asbestos.	Low
133	No visual access gained to enable an assessment	Not known.	Not known

Building Reference Number	Building Description	Features for Bats	Potential
River Adur Western Arm: Map 9			

134	Single storey industrial unit. Constructed of corrugated metal/asbestos with a pitched corrugated asbestos roof containing skylights.	Gaps under the corrugated asbestos roof.	Low
135	Electrical substation comprising low metal units.	None.	Negligible
136	Single storey industrial unit. Constructed of corrugated metal/asbestos with a pitched corrugated asbestos roof containing skylights.	Gaps under the corrugated asbestos roof.	Low
137	Single storey industrial unit. Constructed of corrugated metal/asbestos with a pitched corrugated asbestos roof containing skylights.	Gaps under the corrugated asbestos roof.	Low
138	Two storey brick disused structure, circa 1900s. Pitched tiled roof and likely to support an internal roof void. Windows currently boarded up.	Gaps under the tiles roof.	Moderate
139	Single storey asbestos open fronted barn. Pitched asbestos roof, adjacent to River Adur.	Gaps under corrugated asbestos roof.	Low
140	Single storey brick industrial unit. Pitched corrugated asbestos roof. Timber doors and concrete lintels are present within the brickwork on the north elevation. Corrugated asbestos vertical cladding present on the west elevation.	Gaps between brickwork mortar and concrete lintels. Gaps under the corrugated asbestos.	Low
141	Single storey industrial unit currently in use as a car repair facility. Constructed of brick and supports pre-fabricated cladding on the upper section of the building. Pitched metal roof. Timber facia present between the pitched roof and vertical cladding.	Gaps under corrugated roof.	Low
142	No visual access gained to enable an assessment.	Not known.	Not known
143	Pre-fabricated car wash facility constructed of metal. A garage with timber doors and a brick wall is located to the west of the car wash and form part of this site.	Potential gaps within the brick wall of the garage and associated wall.	Low
144	Single storey modern industrial unit constructed of brick. The roof and upper section of the walls comprise corrugated metal cladding.	Minor gaps under the corrugated metal cladding.	Low
145	Single storey industrial unit circa 1970s. Constructed of concrete blockwork and partially clad with vertical corrugated asbestos. The structure supports a corrugated asbestos roof.	Gaps under the corrugated asbestos.	Low

Building Reference Number	Building Description	Features for Bats	Potential
River Adur Western Arm: Map 10			
146	No visual access to enable an assessment.	Not known.	Not known
147	Three storey Victorian structure constructed of brick and finished with a smooth painted render. Pitched tiled roof likely to support internal roof voids. Timber framed windows. Former residential dwelling now in use as commercial premises. Narrow road provides direct access to the River Adur.	Potential gaps under the roofing features.	Moderate
148	Single storey brick structure circa 1970s. Flat asphalt roof. Timber window frames. Painted timber facia.	Gaps under the painted timber facia and under the flat asphalt roof.	Low
149	Blockwork structure currently in use as an electrical substation. Pitched asphalt roof. Timber fascias are present on all elevations.	Gaps under the timber fascias.	Low
150	2 x industrial units comprising two corrugated metal units with pitched metal roof.	None.	Negligible
	1 x corrugated asbestos industrial unit. Pitched corrugated asbestos roof.	Gaps under corrugated asbestos roof.	Low
151	No visual access gained to enable an assessment.	Not known.	Not known
152	Single storey car retail unit, large glass windows present on north elevation and pre-fabricated panels. Pitched corrugated asbestos roof.	Gaps under the asbestos roof.	Low
153	No visual access to enable an assessment.	Not known.	Not known
154	No visual access to enable an assessment.	Not known.	Not known
155	Two storey modern brick structure with pitched tiled roofs. The structure is likely to support internal roof voids and lie adjacent to the River Adur.	Potential gaps under the roofing features.	Low
156	Single storey modern structure currently in use as a car showroom. Constructed of brick and partially covered with prefabricated smooth panelling.	None.	Negligible
	Riverside Business Centre: Brick single storey industrial structure with pitched asbestos roof. And pre-fabricated metal cladding present on the north elevation.	Gaps under asbestos roof.	Low

Building Reference Number	Building Description	Features for Bats	Potential
Shoreham Harbour: Map 11			
157 -159	No structures present, site under construction.	N/A.	N/A
160	Two storey flint structure, currently in use as a yacht club. UPVC cladding present on the north elevation. Pitched corrugated asbestos roof. Located adjacent to River Adur.	Gaps under the asbestos roof Potential gaps within the flint.	Moderate
161	No visual access gained to enable an assessment.	Not known.	Not known
162	Single storey storage unit. Flat metal roof. Concrete lintel present above a timber door on the west elevation.	Gaps within brickwork mortar Potential gaps under a concrete lintel.	Low
163	Timber shed/outbuilding. Flat corrugated asbestos roof.	Gaps under asbestos roof.	Low

Appendix 5: Plant Species List

Plant Species List for Shoreham Harbour Ecology Study compiled from the Phase 1 habitat survey carried out on 03 March 2015.

Scientific nomenclature and common names for vascular plant follow Stace (2010). Please note that this plant species list was generated as part of a Phase 1 Habitat survey, does not constitute a full botanical survey and should be read in conjunction with the associated Phase 1 Report.

Abundance was estimated using the DAFOR scale as follows:

D = dominant, A = abundant, F = frequent, O = occasional, R = rare, L = locally

Other qualifiers used include:

c=clumped, e=edge only, g=garden origin, p=planted, y=young, s=seedling or sucker, t=tree, h=hedge, w=water, b=butterfly bank, ?=species identiifcation uncertain.

SCIENTIFIC NAME	COMMON NAME	ABUNDANCE	QUALIFIER
Cochlearia danica	Danish scurvygrass	A	e
Acer pseudoplatanus	Sycamore	R	Y, T
Achillea millefolium	Yarrow	R, LF	
Aegopodium podagraria	Ground-elder	R	
Agrostis stolonifera	Creeping bent	O	
Alliaria petiolata	Garlic mustard	R	
Allium vineale?	Crow garlic	R	
Allium schoenoprasum	Chives	R	p
Anagallis arvensis	Scarlet pimpernel	R	
Anisantha sterilis	Barren brome	R	
Anthriscus sylvestris	Cow parsley	R	
Anthyllis vulneraria	Kidney vetch	R	
Apium graveolens	Wild celery	R	
Apium nodiflorum	Fool's water-cress	R	
Arabidopsis thaliana	Thale cress	O	
Arctium minus	Lesser burdock	R	
Armeria maritima	Sea thrift	R	
Asplenium ruta-muraria	Wall-rue	R	
Asplenium scolopendrium	Hart's-tongue	R	
Aster tripolium	Sea aster	R, LF	E
Aster sp.	Michaelmas daisy	R	
Atriplex prostrata	Sperar-leaved orache	R/LF	e
Ballota nigra	Black horehound	R	
Bellis perennis	Daisy	R, LF	
Beta vulgaris ssp. *maritima*	Sea beet	O, LF	

Blackstonia perfoliata	Yellow-wort	R	
Borago officinalis	Borage	R	b
Brachypodium pinnatum	Tor-grass	R, LA	
Brachypodium sylvaticum	False brome	R	
Brassica napus	Rape	R	b
Bromus hordaceus	Soft brome	R	
Briza media	Quaking grass	R	b
Buddleja davidii	Buddleia	O, LA	
Cakile maritima	Sea rocket	r	e
Calystegia sepium	Hedge bindweed	O, LF	
Campanula rotundifolia	Harebell	R	b
Capsella bursa-pastoris	Shepherd's-purse	R	
Cardamine flexuosa	Wavy bitter-cress	O	
Cardamine hirsuta	Hairy bitter-cress	F	
Carpobotris edulis	Hottentot-fig	R	p
Catapodium marinum	Sea Fern-grass	R, LF	
Catapodium rigidum	Fern-grass	R, LF	
Centaurea nigra	Common knapweed	R	
Centaurea cyanus	Cornflower	R	b
Centaurium erythraea	Common centaury	R	
Centranthus ruber	Red valerian	O	
Cerastium fontanum	Common mouse-ear	F	
Cerastium glomeratum	Sticky mouse-ear	R	
Cerastium semidecandrum	Little mouse-ear	R	
Cerastium tomentosum	Snow-in-summer	R	b
Chamaerops humilis	Mediterranean fan palm	R	p
Cirsium arvense	Creeping thistle	R	
Cirsium vulgare	Spear thistle	R	
Clematis vitalba	Traveller's-joy	O	
Conium maculatum	Hemlock	R	
Convolvulus arvensis	Field bindweed	R/LF	
Convolvulus cneorum	Silver binweed	R	p
Conyza canadensis	Canadian fleabane	O, LF	s
Cordyline australis	Cabbage palm	R	p, t, y
Coronopus squamatus	Swine-cress	O	
Coronopus didymum	Lesser swine-cress	R	
Cortaderia selloana	Pampas-grass	R	g
Cotoneaster horizontalis	Wall cotoneaster	R	
Cotoneaster sp.	Cotoneasters	R	g
Crambe maritima	Sea kale	R, LF	

Crataegus monogyna	Hawthorn	R	
Crepis vesicaria	Beaked hawk's-beard	R	
Crithmum maritimum	Rock Samphire	R/LF	
Crocosmia x crocosmiflora	Monbtretia	R, LF	c, g
Cupressus spp.	Cypresses	R	t, p, h
Cymbalaria muralis	Ivy-leaved toadflax	R	
Dactylis glomerata	Cock's-foot	F	
Dasylirion sp.	Sotol	R	p
Daucus carota	Wild carrot	R, LF	
Diplotaxis muralis	Annual wall-rocket	R	
Dipsacus fullonum	Wild teasel	R	
Elaeagnus sp.	Elaeagnus	O	p, h
Elytrigia atherica	Sea couch	O, LA	
Elytrigia repens	Common couch	A, LD	
Epilobium hirsutum	Great willowherb	R/LF	
Equisetum arvense	Field horsetail	R	
Erigeron glaucus	Seaside daisy	R	
Erodium cicutarium	Common stork's-bill	R	
Erophila verna	Common whitlowgrass	R	
Erysimum cheiri	Wallflower	R	b
Euonymus japonicus	Evergreen spindle	O	p, h
Euphorbia peplus	Petty spurge	R	
Fallopia baldschuanica	Russian-vine	R, LF	e
Festuca rubra	Red fescue	O	
Ficaria verna	Lesser celandine	R	
Foeniculum vulgare	Fennel	R, LA	p, g, c
Forsythia sp.	Forsythia	R	p, h
Fraxinus excelsior	Ash	R	s, y
Fumaria officinalis	Common fumitory	R	b
Galanthus nivalis	Snowdrop	R	p
Galium aparine	Cleavers	O	
Galium mollugo	Hedge bedstraw	R	
Galium verum	Lady's bedstraw	R	
Geranium molle	Dove's-foot crane's-bill	R	
Geranium robertianum	Herb-Robert	R	
Glaucium flavum	Yellow horned-poppy	R	
Glechoma hederacea	Ground-ivy	R	
Halimione portulacoides	Sea purslane	R, LA	e
Hedera helix	Ivy	R	
Helminthotheca echioides	Bristly oxtongue	O, LF	

Heracleum sphondylium	Hogweed	R	
Hirschfeldia incana	Hoary mustard	R	
Hyacinthoides hispanica	Spanish bluebell	O	g
Hypericum perforatum	Perforate St John's-wort	R	
Hypochaeris radicata	Cat's-ear	R	
Iberis sp.	Wild candytuft	R	e, b
Ilex aquifolium	Holly	R	
Iris sp.	Iris	R	
Lactuca serriola	Prickly lettuce	R	
Lamium album	White dead-nettle	O	
Lamium purpureum	Red dead-nettle	O	
Lathyrus pratensis	Meadow vetchling	R	
Lavatera thuringiaca	Garden tree-mallow	R	
Lepidium draba	Hoary cress	R, LF	
Leontodon autumnalis	Autumn hawkbit	R	
Leucanthemum vulgare	Oxeye daisy	R	
Leucojum vernum	Spring snowflake	R	g
Ligustrum vulgare	Wild privet	O	
Limonium procerum ssp. *procerum*	Tall sea-lavender	R	e
Linaria purpurea	Purple toadflax	O, LF	
Lobularia maritima	Sweet Alison	R	b
Lolium perenne	Perennial rye-grass	O, LA	
Lonicera sp.	Honeysuckle	R	p, e
Lotus corniculatus	Common bird's-foot-trefoil	O	
Luzula campestris	Field wood-rush	R	
Lycium barbarum	Duke of Argyll's teaplant	R	h, p
Mahonia sp.	Oregon-grape	R	g
Malus domestica	Apple	R	y
Malva arborea	Tree mallow	R	
Malva sylvestris	Common mallow	O	
Malcolmia maritima	Virginia Stock	R	b
Medicago arabica	Spotted medick	O	
Medicago lupulina	Black medick	O, LF	
Medicago polymorpha	Toothed medick	R/LF	d
Melilotus officinalis	Ribbed melilot	R, LF	s
Melilotus altissimus	Tall Melilot	r	
Mercurialis annua	Annual mercury	R	
Muscari armeniacum	Garden grape-hyacinth	R	g
Myosotis arvensis	Field forget-me-not	R	
Narcissus pseudonarcissus cv.	Daffodil	O, LF	g, p

Olearia x haastii	Daisy bush	R	p
Origanum vulgare	Wild marjoram	R	b
Orobanche minor	Common broomrape		
Oxalis articulata	Pink-sorrel	R	
Papaver somniferum	Opium poppy	R	
Papaver sp.	Poppy	R, LF	s
Parapholis incurva	Curved hard-grass	R	
Parapholis strigosa	Hard-grass	R	
Parietaria judaica	Pellitory-of-the-wall	O	
Parthenocissus tricuspidata	Boston-ivy	R	p
Pentaglottis sempervirens	Green alkanet	R	
Petasites fragrans	Winter heliotrope	R, LA	
Phacelia tanacetifolia	Blue/purple tansy	R	b
Phormium cookerianum	New Zealand flax	r	p
Picris hieracioides	Hawkweed oxtongue	A	
Pinus spp.	Pines	R	t, p
Pittosporum tobira	Japanese pittosporum	R	p
Plantago coronopus	Buck's-horn plantain	F	
Plantago lanceolata	Ribwort plantain	O, LA	
Plantago major	Greater plantain	R	
Plantago maritima	Sea plantain	R	
Poa annua	Annual meadow-grass	O	
Poa pratensis	Smooth meadow-grass	R	
Polygonum aviculare	Knotgrass	R	
Potentilla reptans	Creeping cinquefoil	R, LF	
Prunus sp.	Cherry	R	t, p
Prunus spinosa	Blackthorn	R, LF	c
Pulicaria dysenterica	Common fleabane	R	
Ranunculus bulbosus	Bulbous buttercup	R	
Ranunculus repens	Creeping buttercup	R	
Raphanus raphanistrum ssp. *raphanistrum*	Sea radish	R	
Reseda luteola	Weld	r	b
Rubus fruticosus agg.	Bramble	O, LF	
Rumex acetosa	Common sorrel	R	
Rumex crispus	Curled dock	R	
Rumex obtusifolius	Broad-leaved dock	R	
Sagina maritima	Sea pearlwort	R	
Sagina procumbens	Procumbent pearlwort	R	
Salix cinerea	Grey willow	R	y, s
Sambucus nigra	Elder	O	

Santolina chamaecyparissus	Cotton lavender	R	p
Schedonorus arundinaceus	Tall fescue	R, LF	
Scrophularia nodosa	Common figwort	R	
Sedum acre	Biting stonecrop	R	
Sedum album	White stonecrop	O	
Senecio cineraria	Silver ragwort	O	g
Senecio inaequidans	Narrow-leaved ragwort	R	
Senecio jacobaea	Common ragwort	O, LF	
Senecio squalidus	Oxford ragwort	O	
Senecio vulgaris	Groundsel	O	
Silene latifolia	White campion	R	
Silene uniflora	Sea campion	R	e
Sisymbrium officinale	Hedge mustard	R	
Sisymbrium orientale	Eastern rocket	F	
Smyrnium olusatrum	Alexanders	O, LF	
Solanum dulcamara	Bittersweet	R	
Solanum nigrum	Black nightshade		
Sonchus oleraceus	Smooth sow-thistle	R	
Spergularia marina	Lesser sea-spurrey	R	
Stellaria media	Common chickweed	F	
Symphoricarpos albus	Snowberry	R, LF	p, h
Symphytum orientale	White comfrey	R	
Syringa vulgaris	Lilac	R	g
Tamarix gallica	Tamarisk	R	p
Tanacetum parthenium	Feverfew	R	c
Taraxacum sp.	Dandelion	F	
Tragopogon porrifolius	Salsify	R	
Trifolium dubium	Lesser trefoil	R	
Trifolium pratense	Red clover	R	
Trifolium repens	White clover	F	
Trifolium scabrum	Rough clover		
Tripleurospermum maritimum	Sea mayweed	R	
Trisetum flavescens	Yellow oat-grass	R	
Triticum aestivum	Bread wheat	R	b
Tulipa sp.	Garden tulip	R	g
Tussilago farfara	Colt's-foot	R, LF	
Ulex europaeus	Gorse	R	
Ulmus procera	English elm	R, LF	
Urtica dioica	Common nettle	O, LF	
Valerianella locusta	Common cornsalad	R	

Verbascum thapsus	Great mullein	R	
Veronica arvensis	Wall speedwell	R	
Veronica hederifolia	Ivy-leaved speedwell	R	
Veronica persica	Common field-speedwell	O, LF	
Veronica sp.	Hedge veronica	O	p
Vicia sativa	Common vetch	R	
Vinca minor	Lesser periwinkle	R	
Viola odorata	Sweet violet	R	g

Appendix 6: Adur Estuary SSSI Citation and Management Views

COUNTY: WEST SUSSEX SITE NAME: ADUR ESTUARY

DISTRICT: ADUR

Status: Site of Special Scientific Interest (SSSI) notified under Section 28 of the Wildlife and Countryside Act 1981.

Local Planning Authority: ADUR DISTRICT COUNCIL

National Grid Reference: TQ 208 056 Area: 62.2 (ha.) 153.6 (ac.)

Ordnance Survey Sheet 1:50,000: 197 1:10,000: TQ 20 NW

Date Notified (Under 1949 Act): – Date of Last Revision: –

Date Notified (Under 1981 Act): 1987 Date of Last Revision: –

Other Information:
This is a new site. Part of the site is an RSPB Reserve.

Reasons for Notification:
The Adur Estuary, together with Rye Harbour further to the east, represent the only significant areas of saltmarsh between Chichester and Pagham Harbours in West Sussex, and Sandwich Bay in Kent, The estuarine plant communities are unusual due to the relative scarcity of cord-grass, *Spartina* spp. The large area of intertidal mudflats within the estuary are important for a variety of wading birds.

Saltmarsh plants fringe most of the estuary and in places have colonised large areas of mudflats. Sea purslane *Halimione portaculoides* dominates most of the areas above mean high water mark, and annual seablite *Suaeda maritima* is also extremely frequent in these areas. Towards the mean low 999, glasswort *Salicornia* sp. is dominant and sea aster *Aster tripolium* becomes more abundant. Other species are scattered throughout the saltmarsh community, including common sea lavender *Limonium vulgare*, thrift *Armeria maritima*, sea plantain *Plantago maritima* and sea poa grass, *Puccinella maritima*. Cord grass *Spartina* spp. is noticeably absent from most of the estuary, but a small stand does grow southeast of the Old Shoreham Bridge.

At the landward margin of the saltmarsh a variety of herbs and shrubs are frequent, including mugwort *Artemisia vulgaris*, orache *Atriplex* spp., teasel *Dipsacus fullonum*, yarrow *Achillea millefolium* and elm *Ulmus procera*.

The intertidal mudflats of the Adur Estuary support a number of wading birds, particularly redshank, dunlin and ringed plover. The number of ringed plover regularly exceed 1% of the total British population, making the estuary of national importance for this species. A variety of species breed within the reedbed adjacent to the estuary north of the A27, including moorhen, reed warbler and sedge warbler.

The estuary embankment near the car park supports a large colony of viviparous lizards, *Lacerta vivipara*.

A statement of English Nature's views about the management of Adur Estuary Site of Special Scientific Interest (SSSI).

This statement represents English Nature's views about the management of the SSSI for nature conservation. This statement sets out, in principle, our views on how the site's special conservation interest can be conserved and enhanced. English Nature has a duty to notify the owners and occupiers of the SSSI of its views about the management of the land.

Not all of the management principles will be equally appropriate to all parts of the SSSI. Also, there may be other management activities, additional to our current views, which can be beneficial to the conservation and enhancement of the features of interest.

The management views set out below do not constitute consent for any operation. English Nature's written consent is still required before carrying out any operation likely to damage the features of special interest (see your SSSI notification papers for a list of these operations). English Nature welcomes consultation with owners, occupiers and users of the SSSI to ensure that the management of this site conserves and enhances the features of interest, and to ensure that all necessary prior consents are obtained.

Management Principles

Littoral sediments (mud and sand flats)

Intertidal mud and sand flats include a range of generally muddy or sandy low-gradient shores that are exposed to air during low tide and submerged during the higher tides. High energy shores, such as those on open coasts, are generally sandy in nature whilst more sheltered, low energy flats are muddier. They support a wide variety of marine invertebrates that represent an important food source for many fish and bird species.

Good water quality and sediment quality should be maintained, and the sediment budget within the estuarine or coastal system should not be restricted by anthropogenic influences.

The birds that use mud and sandflats for feeding and roosting are vulnerable to disturbance from human activities, for example, bait digging, dog walking and wildfowling. These activities can lead to reduced time spent feeding, or individuals being restricted to areas with a poor food supply. Disturbance should therefore be minimised, especially at times when bird populations may be stressed, such as during severe winter weather.

The location and extent of mud or sandflats is dependent on the extent to which the estuary or coast where they occur is constrained from responding to sea level rise and changing sediment regimes. Management needs to create space to enable landward roll-back to take place in response to sea-level rise, and should also allow the system to be dynamic and retain the flexibility to respond to associated changes such as the movement of physical features within the system, e.g. migrating subtidal sandbanks.

Coastal saltmarsh

Saltmarshes form the upper vegetated portions of intertidal mudflats in sheltered coastal locations, such as estuaries, lagoons and beach plains. There is typically a zonation of vegetation, from plants adapted to regular immersion by the tides (halophytes), through to more widespread plant species in the areas less frequently covered by the sea. The halophyte plant species are confined to this type of habitat, and areas of structurally diverse

vegetation provide good invertebrate habitat. Saltmarshes are also important nursery sites for several fish species, and important refuge, feeding and breeding grounds for wading birds and wildfowl.

Where saltmarshes require management this has traditionally been achieved by grazing, and previously used regimes should be continued. Grazing provides a variety of different habitats, particularly for wintering bird species, and if grazing were to cease there may be a loss of botanical diversity. The precise timing and intensity will vary according to local conditions and requirements, for example the type or availability of stock, or the need to avoid trampling ground nesting birds. However on many sites, the aim of will be to create a short turf that can be attractive to over-wintering wildfowl, with a reduction in stock density in the early summer for the benefit of ground-nesting birds. Indeed, careful reduction of grazing can increase the number of breeding birds, without significantly altering the plant species composition. Care should be taken not to overgraze the site, as this may reduce the diversity of animal and plant species that the saltmarsh is able to support, as well as potentially impact the sediments supporting the saltmarsh.

Not all saltmarsh habitats require active management to retain their conservation interest. Where there has not been a history of grazing, the saltmarsh will be able to maintain itself and grazing-sensitive species are likely to be present, therefore grazing should not be introduced.

There are a number of factors that are contributing to saltmarsh change that management may need to take into consideration. These include coastal erosion as a result of coastal flood-defence works, rising sea-levels, variations in sediment deposition, and land claim for development.

Swamp

Swamp habitats develop on the fringes of open water, or in shallow depressions with permanent standing water. The plants may be rooted in the submerged soil or form a floating mat of inter-twined roots, rhizomes and stems. Swamps usually consist of a dominant single species of plant (e.g. reeds, tussock sedges, reedmace, reed sweet grass, reed canary grass and bull rushes) with a few other species thinly distributed among them. In common with most other types of wetland, swamps represent a transient stage in the change from open water to dry land.

Management should either seek to retain swamp communities in the same place or should acknowledge the dynamics of succession by ensuring there is always a new niche for the swamp communities to develop in. The succession from swamp into floodplain fen, for example, as the diversity of species present increases, may be slowed by raising the water table and by periodically removing any encroaching scrub. If the vegetation surface of the whole wetland appears to be building up or drying out for some other reason it may be necessary to lower the ground level by creating scrapes or ponds. A programme of rotational cutting to maintain the reedbed may be necessary to encourage the vigorous growth of reed whilst preventing excessive build up of litter. Cutting should take place during the winter (November – March) and all cut material should be removed.

Management should ensure that appropriate water quality is maintained according to the requirements of the wetland communities present. Where swamp is in continuity with a waterbody, the water quality in the waterbody will affect the swamp. While some communities, such as reed swamp are unlikely to be very sensitive to nutritional enrichment, others, such as tussock sedge and narrow leaved reedmace, will be out-competed by other species (e.g. reed or reed sweet grass) where any increase in the amount of nutrients present occurs.

Swamp habitats have often survived where the vegetation has traditionally been cut for a variety of purposes, including use as building materials or animal bedding. It may be beneficial to consider re-instating these traditional management practices where they are not in conflict with other nature conservation objectives, such as the specific requirements of certain birds or invertebrates.

All habitats

The habitats within this site are highly sensitive to inorganic fertilisers and pesticides, applications of which should be avoided both within the site itself and in adjacent surrounding areas. Herbicides may be useful in targeting certain invasive species, but should be used with extreme care. Access to this site, and any recreational activities within, may also need to be controlled.

Appendix 7: Legislation and Policy

Important Notice: This section contains details of legislation and planning policy applicable in Britain only (i.e. not including the Isle of Man, Northern Ireland, the Republic of Ireland or the Channel Islands) and is provided for general guidance only. While every effort has been made to ensure accuracy, this section should not be relied upon as a definitive statement of the law.

A NATIONAL LEGISLATION AFFORDED TO SPECIES

The objective of the EC Habitats Directive[17] is to conserve the various species of plant and animal which are considered rare across Europe. The Directive is transposed into UK law by The Conservation of Habitats and Species Regulations 2010 (as amended) (formerly The Conservation (Natural Habitats, &c.) Regulations 1994 (as amended) and The Offshore Marine Conservation (Natural Habitats, &c.) Regulations 2007 (as amended).

The Wildlife and Countryside Act 1981 (as amended) is a key piece of national legislation which implements the Convention on the Conservation of European Wildlife and Natural Habitats (Bern Convention) and implements the species protection obligations of Council Directive 2009/147/EC (formerly 79/409/EEC) on the Conservation of Wild Birds (EC Birds Directive) in Great Britain.

Since the passing of the Wildlife & Countryside Act 1981, various amendments have been made, details of which can be found on www.opsi.gov.uk. Key amendments have been made through the Countryside and Rights of Way (CRoW) Act (2000) and Nature Conservation (Scotland) Act 2004.

Other legislative Acts affording protection to wildlife and their habitats include:

- Deer Act 1991
- Countryside and Rights of Way (CRoW) Act 2000
- Natural Environment & Rural Communities (NERC) Act 2006
- Protection of Badgers Act 1992
- Wild Mammals (Protection) Act 1996

Species and species groups that are protected or otherwise regulated under the aforementioned domestic and European legislation, and that are most likely to be affected by development activities, include herpetofauna (amphibians and reptiles), badger, bats, birds, dormouse, invasive plant species, otter, plants, red squirrel, water vole and white clawed crayfish.

Explanatory notes relating to species protected under The Conservation of Habitats and Species Regulations 2010 (as amended) (which includes smooth snake, sand lizard, great crested newt and natterjack toad), all bat species, otter, dormouse and some plant species)

[17] Council Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Fauna and Flora

are given below. **These should be read in conjunction with the relevant species sections that follow.**

- In the Directive, the term 'deliberate' is interpreted as being somewhat wider than intentional and may be thought of as including an element of recklessness.
- The Conservation of Habitats and Species Regulations 2010 (as amended) does not define the act of 'migration' and therefore, as a precaution, it is recommended that short distance movement of animals for e.g. foraging, breeding or dispersal purposes are also considered.
- In order to obtain a European Protected Species Mitigation (EPSM) licence, the application must demonstrate that it meets all of the following three 'tests': i) the action(s) are necessary for the purpose of preserving public health or safety or other imperative reasons of overriding public interest including those of a social or economic nature and beneficial consequence of primary importance for the environment; ii) that there is no satisfactory alternative and iii) that the action authorised will not be detrimental to the maintenance of the species concerned at a favourable conservation status in their natural range.

Herpetofauna (Amphibians and Reptiles)

The sand lizard *Lacerta agilis*, smooth snake *Coronella austriaca*, natterjack toad *Epidalea calamita* and great crested newt *Triturus cristatus* receive full protection under The Conservation of Habitats and Species Regulations 2010 (as amended) through their inclusion on Schedule 2. The pool frog *Pelophylax lessonae* is also afforded full protection under the same legislation. Regulation 41 prohibits:

- Deliberate killing, injuring or capturing of species listed on Schedule 2
- Deliberate disturbance of any Schedule 2 species as:

  a) to impair their ability:

  (i) to survive, breed, or reproduce, or to rear or nurture young;

  (ii) in the case of animals of a hibernating or migratory species, to hibernate or migrate

  b) to affect significantly the local distribution or abundance of the species
- Deliberate taking or destroying of the eggs of a Schedule 2 species
- Damage or destruction of a breeding site or resting place
- Keeping, transporting, selling, exchanging or offering for sale whether live or dead or of any part thereof.

With the exception of the pool frog, these species are also currently listed on Schedule 5 of the Wildlife and Countryside Act 1981 (as amended). Under this Act, they are additionally protected from:

- Intentional or reckless disturbance (at any level)
- Intentional or reckless obstruction of access to any place of shelter or protection
- Selling, offering or exposing for sale, possession or transporting for purpose of sale.

Other native species of herpetofauna are protected solely under Schedule 5 of the Wildlife & Countryside Act 1981 (as amended). Species such as the adder *Vipera berus*, grass snake *Natrix natrix*, common lizard *Zootoca vivipara* and slow-worm *Anguis fragilis* are listed in respect to Section 9(1) & (5). For these species, it is prohibited to:

- Intentionally (or recklessly in Scotland) kill or injure these species

- Sell, offer or expose for sale, possess or transport for purpose of sale these species, or any part thereof.

Common frog *Rana temporaria*, common toad *Bufo bufo*, smooth newt *Lissotriton vulgaris* and palmate newt *L. helveticus* are listed in respect to Section 9(5) only which affords them protection against sale, offering or exposing for sale, possession or transport for the purpose of sale.

How is the legislation pertaining to herpetofauna liable to affect development works?

A European Protected Species Mitigation (EPSM) Licence issued by the relevant countryside agency (e.g. Natural England) will be required for works liable to affect the breeding sites or resting places of those amphibian and reptile species protected under The Conservation Habitats and Species Regulations 2010 (as amended). A licence will also be required for operations liable to result in a level of disturbance which might impair their ability to undertake those activities mentioned above (e.g. survive, breed, rear young and hibernate). The licences are to allow derogation from the relevant legislation but also to enable appropriate mitigation measures to be put in place and their efficacy to be monitored.

Although not licensable, appropriate mitigation measures may also be required to prevent the intentional killing or injury of adder, grass snake, common lizard and slow worm, thus avoiding contravention of the Wildlife and Countryside Act 1981 (as amended).

Badger

Badgers *Meles meles* receive protection under The Protection of Badgers Act 1992 which consolidates the previous Badger Acts of 1973 and 1991. The Act makes it an offence to:

- Wilfully kill, injure, take, or attempt to kill, injure or take a badger
- Cruelly ill-treat a badger, including use of tongs and digging
- Possess or control a dead badger or any part thereof
- Intentionally or recklessly damage, destroy or obstruct access to a badger sett[18] or any part thereof
- Intentionally or recklessly disturb[19] a badger when it is occupying a badger sett
- Intentionally or recklessly cause a dog to enter a badger sett
- Sell or offers for sale, possesses or has under his control, a live badger

[18] A badger sett is defined in the legislation as *"any structure or place which displays signs indicating current use by a badger"*. This includes seasonally used setts. Natural England (2009) have issued guidance on what is likely to constitute current use of a badger sett: www.naturalengland.org.uk/Images/WMLG17_tcm6-11815.pdf

[19] For guidance on what constitutes disturbance and other licensing queries, see Natural England (2007) Badgers & Development: A Guide to Best Practice and Licensing. www.naturalengland.org.uk/Images/badgers-dev-guidance_tcm6-4057.pdf, Natural England (2009) Interpretation of 'Disturbance' in relation to badgers occupying a sett www.naturalengland.org.uk/Images/WMLG16_tcm6-11814.pdf, Scottish Natural Heritage (2002) Badgers & Development. www.snh.org.uk/publications/online/wildlife/badgersanddevelopment/default.asp and Countryside Council for Wales (undated) Badgers: A Guide for Developers. www.ccw.gov.uk.

How is the legislation pertaining to badgers liable to affect development works?

A Development Licence[20] will be required from the relevant countryside agency (e.g. Natural England) for any development works liable to affect an active badger sett, or to disturb badgers whilst in the sett. Depending on the nature of the works and the specifics of the sett and its environs, badgers could be disturbed by work near the sett even if there is no direct interference or damage to the sett itself. The countryside agencies have issued guidelines on what constitutes a licensable activity. N.B. there is no provision in law for the capture of badgers for development purposes and therefore it is not possible to obtain a licence to translocate badgers from one area to another.

Bats

All species of bat are fully protected under The Conservation of Habitats and Species Regulations 2010 (as amended) through their inclusion on Schedule 2. Regulation 41 prohibits:

- Deliberate killing, injuring or capturing of Schedule 2 species (e.g. all bats)
- Deliberate disturbance of bat species as:
  a) to impair their ability:
    (i) to survive, breed, or reproduce, or to rear or nurture young;
    (ii) to hibernate or migrate[3]
  b) to affect significantly the local distribution or abundance of the species
- Damage or destruction of a breeding site or resting place
- Keeping, transporting, selling, exchanging or offering for sale whether live or dead or of any part thereof.

Bats are also currently protected under the Wildlife and Countryside Act 1981 (as amended) through their inclusion on Schedule 5. Under this Act, they are additionally protected from:

- Intentional or reckless disturbance (at any level)
- Intentional or reckless obstruction of access to any place of shelter or protection
- Selling, offering or exposing for sale, possession or transporting for purpose of sale.

How is the legislation pertaining to bats liable to affect development works?

A European Protected Species Mitigation (EPSM) Licence issued by the relevant countryside agency (e.g. Natural England) will be required for works liable to affect a bat roost or for operations likely to result in a level of disturbance which might impair their ability to undertake those activities mentioned above (e.g. survive, breed, rear young and hibernate). The licence is to allow derogation from the relevant legislation but also to enable appropriate mitigation measures to be put in place and their efficacy to be monitored.

Though there is no case law to date, the legislation may also be interpreted such that, in certain circumstances, important foraging areas and/or commuting routes can be regarded as being afforded *de facto* protection, for example, where it can be proven that the

[20] Natural England will only consider issuing a licence where detailed planning permission (if applicable to operation) has already been granted.

continued usage of such areas is crucial to maintaining the integrity and long-term viability of a bat roost[21].

Birds

All wild birds, their nests and eggs are protected under Sections 1-8 of the Wildlife and Countryside Act 1981 (as amended). Among other things, this makes it an offence to:

- Intentionally (or recklessly in Scotland) kill, injure or take any wild bird
- Intentionally (or recklessly in Scotland) take, damage or destroy (or, in Scotland, otherwise interfere with) the nest of any wild bird while it is in use or being built
- Intentionally take or destroy an egg of any wild bird
- Sell, offer or expose for sale, have in his possession or transport for the purpose of sale any wild bird (dead or alive) or bird egg or part thereof.
- In Scotland only, intentionally or recklessly obstruct or prevent any wild bird from using its nest

Certain species of bird, for example the barn owl, black redstart, hobby, bittern and kingfisher receive additional special protection under Schedule 1 of the Act and Annex 1 of the European Community Directive on the Conservation of Wild Birds (2009/147/EC). This affords them protection against:

- Intentional or reckless disturbance while it is building a nest or is in, on or near a nest containing eggs or young
- Intentional or reckless disturbance of dependent young of such a bird
- In Scotland only, intentional or reckless disturbance whilst lekking
- In Scotland only, intentional or reckless harassment

How is the legislation pertaining to birds liable to affect development works?

To avoid contravention of the Wildlife and Countryside Act 1981 (as amended), works should be planned to avoid the possibility of killing or injuring any wild bird, or damaging or destroying their nests. The most effective way to reduce the likelihood of nest destruction in particular is to undertake work outside the main bird nesting season which typically runs from March to August[22]. Where this is not feasible, it will be necessary to have any areas of suitable habitat thoroughly checked for nests prior to vegetation clearance.

Those species of bird listed on Schedule 1 are additionally protected against disturbance during the nesting season. Thus, it will be necessary to ensure that no potentially disturbing works are undertaken in the vicinity of the nest. The most effective way to avoid disturbance is to postpone works until the young have fledged. If this is not feasible, it may be possible to maintain an appropriate buffer zone or standoff around the nest.

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[21] Garland & Markham (2008) Is important bat foraging and commuting habitat legally protected? Mammal News, No. **150**. The Mammal Society, Southampton.

[22] It should be noted that this is the main breeding period. Breeding activity may occur outside this period (depending on the particular species and geographical location of the site) and thus due care and attention should be given when undertaking potentially disturbing works at any time of year.

Wild Mammals (Protection) Act 1996

All wild mammals are protected against intentional acts of cruelty under the above legislation. This makes it an offence to:

- Mutilate, kick, beat, nail or otherwise impale, stab, burn, stone, crush, drown, drag or asphyxiate any wild mammal with intent to inflict unnecessary suffering.

To avoid possible contravention, due care and attention should be taken when carrying out works (for example operations near burrows or nests) with the potential to affect any wild mammal in this way, regardless of whether they are legally protected through other conservation legislation or not.

Invertebrates – Short-snouted and spiny sea horses

These species are listed on Schedule 5 of the Wildlife and Countryside Act 1981 (as amended). Under this Act, they are additionally protected from:

- Intentional or reckless disturbance (at any level)
- Intentional or reckless obstruction of access to any place of shelter or protection
- Selling, offering or exposing for sale, possession or transporting for purpose of sale.

Invasive Plant Species

Certain species of plant, including Japanese knotweed *Fallopia japonica,* giant hogweed *Heracleum mantegazzianum* and Himalayan balsam *Impatiens glandulifera* are listed on Part II of Schedule 9 of the Wildlife and Countryside Act 1981 (as amended) in respect to Section 14(2). Such species are generally non-natives whose establishment or spread in the wild may be detrimental to native wildlife. Inclusion on Part II of Schedule 9 therefore makes it an offence to plant or otherwise cause these species to grow in the wild.

How is the legislation pertaining to invasive plants liable to affect development works?

Although it is not an offence to have these plants on your land *per se*, it is an offence to *cause* these species to grow in the wild. Therefore, if they are present on site and development activities (for example movement of spoil, disposal of cut waste or vehicular movements) have the potential to cause the further spread of these species to new areas, it will be necessary to ensure appropriate measures are in place to prevent this happening prior to the commencement of works.

Plants: Injurious Weeds

Under the Weeds Act 1959 any land owner or occupier may be required prevent the spread of certain 'injurious weeds' such as spear thistle *Cirsium vulgare*, creeping thistle *Cirsium arvense*, curled dock *Rumex crispus*, broad-leaved dock *Rumex obtusifolius*, and common ragwort *Senecio jacobaea*. It is a criminal offence to fail to comply with a notice requiring such action to be taken. The Ragwort Control Act 2003 establishes a ragwort control code of practice as common ragwort is poisonous to horses and other livestock. This code provides best practice guidelines and is not legally binding.

B NATIONAL AND EUROPEAN LEGISLATION AFFORDED TO HABITATS

Statutory Designations: National

Nationally important areas of special scientific interest, by reason of their flora, fauna, or geological or physiographical features, are notified by the countryside agencies as statutory

Sites of Special Scientific Interest (SSSIs) under the National Parks and Access to the Countryside Act 1949 and latterly the Wildlife & Countryside Act 1981 (as amended). As well as underpinning other national designations (such as National Nature Reserves which are declared by the countryside agencies under the same legislation), the system also provides statutory protection for terrestrial and coastal sites which are important within a European context (Natura 2000 network) and globally (such as Wetlands of International Importance). See subsequent sections for details of these designations. Improved provisions for the protection and management of SSSIs have been introduced by the Countryside and Rights of Way Act 2000 (in England and Wales) and the Nature Conservation (Scotland) Act 2004.

The Wildlife & Countryside Act 1981 (as amended) also provides for the making of Limestone Pavement Orders, which prohibit the disturbance and removal of limestone from such designated areas, and the designation of Marine Nature Reserves, for which byelaws must be made to protect them.

Statutory Designations: International

Special Protection Areas (SPAs), together with Special Areas of Conservation (SACs) form the Natura 2000 network. The Government is obliged to identify and classify SPAs under the EC Birds Directive (Council Directive 2009/147/EC (formerly 79/409/EEC)) on the Conservation of Wild Birds). SPAs are areas of the most important habitat for rare (listed on Annex I of the Directive) and migratory birds within the European Union. Protection afforded SPAs in terrestrial areas and territorial marine waters out to 12 nautical miles (nm) is given by The Conservation of Habitats & Species Regulations 2010 (as amended). The Offshore Marine Conservation (Natural Habitats, &c.) Regulations 2007 (as amended) provide a mechanism for the designation and protection of SPAs in UK offshore waters (from 12-200 nm).

The Government is obliged to identify and designate SACs under the EC Habitats Directive (Council Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Fauna and Flora). These are areas which have been identified as best representing the range and variety of habitats and (non-bird) species listed on Annexes I and II to the Directive within the European Union. SACs in terrestrial areas and territorial marine waters out to 12 nautical miles are protected under The Conservation of Habitats & Species Regulations 2010 (as amended). The Offshore Marine Conservation (Natural Habitats, &c.) Regulations 2007 (as amended) provide a mechanism for the designation and protection of SACs in UK offshore waters (from 12-200 nm).

Ramsar sites are designated under the Convention on Wetlands of International Importance, agreed in Ramsar, Iran, in 1971. The Convention covers all aspects of wetland conservation and wise use, in particular recognizing wetlands as ecosystems that are globally important for biodiversity conservation. Wetlands can include areas of marsh, fen, peatland or water and may be natural or artificial, permanent or temporary. Wetlands may also incorporate riparian and coastal zones adjacent to the wetlands. Ramsar sites are underpinned through prior notification as Sites of Special Scientific Interest (SSSIs) and as such receive statutory protection under the Wildlife & Countryside Act 1981 (as amended) with further protection provided by the Countryside and Rights of Way (CRoW) Act 2000. Policy statements have been issued by the Government in England and Wales highlighting the special status of Ramsar sites. This effectively extends the level of protection to that afforded to sites which have been designated under the EC Birds and Habitats Directives as part of the Natura 2000 network (e.g. SACs & SPAs).

Statutory Designations: Local

Under the National Parks and Access to the Countryside Act 1949 Local Nature Reserves (LNRs) may be declared by local authorities after consultation with the relevant countryside agency. LNRs are declared for sites holding special wildlife or geological interest at a local level and are managed for nature conservation, and provide opportunities for research and education and enjoyment of nature.

Non-Statutory Designations

Areas considered to be of local conservation interest may be designated by local authorities as a Wildlife Site, under a variety of names such as County Wildlife Sites (CWS), Listed Wildlife Sites (LWS), Local Nature Conservation Sites (LNCS), Sites of Biological Importance (SBIs), Sites of Importance for Nature Conservation (SINCs), or Sites of Nature Conservation Importance (SNCIs). The criteria for designation may vary between counties.

Together with the statutory designations, these are defined in local and structure plans under the Town and Country Planning system and are a material consideration when planning applications are being determined. The level of protection afforded to these sites through local planning policies and development frameworks may vary between counties.

Regionally Important Geological and Geomorphological Sites (RIGS) are the most important places for geology and geomorphology outside land holding statutory designations such as SSSIs. Locally-developed criteria are used to select these sites, according to their value for education, scientific study, historical significance or aesthetic qualities. As with local Wildlife Sites, RIGS are a material consideration when planning applications are being determined.

C NATIONAL PLANNING POLICY

National Planning Policy Framework

The National Planning Policy Framework replaced PPS9 and emphasises the need for sustainable development. The Framework specifies the need for protection of designated sites and priority habitats and priority species. An emphasis is also made for the need for ecological networks via preservation, restoration and re-creation. The protection and recovery of priority species – presumably those listed as UK Biodiversity Action Plan priority species – is also listed as a requirement of planning policy. In determining planning application, planning authorities should aim to conserve and enhance biodiversity by ensuring that: designated sites are protected from adverse harm; there is appropriate mitigation or compensation where significant harm cannot be avoided; opportunities to incorporate biodiversity in and around developments are encouraged; planning permission is refused for development resulting in the loss or deterioration of irreplaceable habitats including aged or veteran trees and also ancient woodland.

The Natural Environment and Rural Communities Act 2006 and The Biodiversity Duty

The Natural Environment and Rural Communities (NERC) Act came into force on 1st October 2006. Section 40 of the Act requires all public bodies to have regard to biodiversity conservation when carrying out their functions. This is commonly referred to as the 'biodiversity duty'.

Section 41 of the Act (Section 42 in Wales) requires the Secretary of State to publish a list of habitats and species which are of 'principal importance for the conservation of biodiversity.' This list is intended to assist decision makers such as public bodies in implementing their duty under Section 40 of the Act. Under the Act these habitats and species are regarded as a material consideration in determining planning applications. A developer must show that their protection has been adequately addressed within a development proposal.

D BIODIVERSITY ACTION PLANs (BAPs)

The UK BAP was published in 1994 to comply with obligations under the Convention on Biological Diversity (The Biodiversity Treaty, 1992). It described the UK's biological resources and committed to developing detailed plans to conserve these recourses i.e. Habitat Action Plans and Species Action Plans. The most up to date targets and actions, including latest progress reports, for UK HAPs and SAPs can be viewed on the DEFRA website[23]. Running parallel to this, Local Planning Authorities (LPAs) promoted habitat and species conservation at a county and district/borough level through their development of Local BAPs (LBAPs).

Since the publication of these BAPs, new strategies and frameworks have resulted in the devolvement of biodiversity issues and changes in the terminology used to describe these habitats and species in England. This has been brought about through the replacement of the previous England Biodiversity Strategy with *Biodiversity 2020: A Strategy For England's Wildlife and Ecosystem Services* (2011) and the replacement of the UK BAP itself with the *UK Post-2010 Biodiversity Framework* (2012).

All previous UK BAP species and habitats are still of material consideration in the planning process but are now referred to as Habitats and Species of Principal Importance for the Conservation of Biodiversity in England as listed in Section 41 of the Natural Environment and Rural Communities (NERC) Act 2006. The promotion of priority habitats and species in LBAPs are also of material consideration in the planning process.

In addition to the now redundant national BAP, BAPs were are also produced at the county level. **The Sussex BAP** is managed by the Sussex Biodiversity Partnership. The aims and objectives of the Sussex BAP are to reflect national targets for habitats and species of principal importance, translate them at a local level and to integrate the needs of species and habitats within landscape-scale delivery.

[23] DEFRA website http://ukbars.defra.gov.uk/plans/national.asp?S=&L=1&O=&SAP=&HAP=&submitted=1&flipLang=&txtLogout

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