



Walsingham Planning

Land adjacent to Langstone

Technology Park

Preliminary Ecological Appraisal (Update)

13 March 2015

The Pavilion, 1st Floor, Botleigh Grange Office Campus, Hedge End, Southampton, Hampshire, SO30 2AF

Tel: 02382 022 800

Email: ecology@wyg.com



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Prepared by:	Sarah Cruickshank Assistant Ecologist	Signed:	
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Checked and Verified by:	Tamsin Clark MCIEEM Associate Ecologist Claire Wilmer CEnv MCIEEM	Signed:	
On behalf of:	Director of Ecology		

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Contents Page

Executive Summary	1
1.0 Introduction	4
1.1 Background	4
1.2 Site Location and General Description	4
1.3 Development Proposals	4
1.4 Survey and Reporting Objectives	5
2.0 Data Search	6
2.1 Data Search Methodology	6
2.2 Data Search Results	6
3.0 Survey Methodology	16
3.1 Habitats	16
3.2 Protected and Notable Species	16
3.3 Invasive Species	18
3.4 Limitations	18
4.0 Survey Results	20
4.1 Habitats	20
4.2 Protected and Notable Species	30
5.0 Ecological Impacts and Recommendations	37
5.1 Statutory and Non-statutory Sites	37
5.2 Habitats	37
5.3 Protected and Notable Species	39
6.0 References	44

Appendix Contents

Appendix A - Figures

Appendix B – Biodiversity and Environmental Legislation, Conventions & Threatened Lists

Appendix C – Data Search Results

Appendix D – Wildlife Boxes

Appendix E – Wildlife-friendly Planting



Land adjacent to Langstone Technology Park

Preliminary Ecological Appraisal (Update)

Executive Summary

Site Description and Scope of Works		
The site comprises land to the east of Langstone Technology Park, and was previously a playing field for Bosmere Junior School until 1999. It is centred at OS grid reference SU715057 and has an area of 1.05 ha. The site is located adjacent to Langstone Technology (LTP) Park just off the junction of the A27 and A3023 Langstone Road, and is surrounded by residential and industrial areas. The Lavant Stream runs down the western site boundary. This waterway is heavily culverted through the Havant area, and runs into Langstone Harbour. The site now contains majority hard standing at the southern section of the site with a restaurant and associated car parking present. Bare ground is present at the northern section of the site where development has commenced. Some plantation broadleaf woodland is present along the northern boundary with the A27, some areas of scrub hedgerow are present around the northern and eastern peripheries and some scattered trees are present along the western boundary adjacent to Lavant Stream The site has partially been developed and comprises a restaurant with associated parking and landscaping. This premises is open. The northern half of the site which is currently dominated by bare ground has existing planning permission for a Premier Inn hotel, however Walsingham Planning are preparing a revised Reserved Matters application amend the proposals for the Premier Inn. A standoff buffer will be retained from the Stream, including the scattered trees along this boundary.		
Potential Constraints	Yes	No
Bats		
Has the site been assessed for bats?	✓	
Are there any structures or trees on site which have the potential to support roosting bats? (see section 5.3.2)	✓	
Breeding Birds		
Has the site been assessed for breeding birds?	✓	
Will areas of hedgerow, scrub, woodland, trees or other features likely to be used by nesting birds be affected by the proposal?		✓
Badgers		
Has the site been assessed for badgers?	✓	
Is there any evidence of badgers on or near the application site including setts, foraging or commuting?		✓
Great crested newts		
Has the site been assessed for great crested newts?	✓	
Is there suitable habitat for great crested newts on, or close to the application site?		✓
Reptiles		
Has the site been assessed for reptiles?	✓	
Is there suitable habitat on the site for reptiles?		✓
Dormice		
Has the site been assessed for dormice?	✓	
Is there suitable habitat for dormice on, or close to the application site?		✓
Otters		
Has the site been assessed for otters?	✓	



Is there suitable habitat on the site for otters?	√	
Water Vole		
Has the site been assessed for water vole?	√	
Is there suitable habitat on the site for water vole?	√	
Other protected species		
Has the site been assessed for other species?	√	
Is there suitable habitat on the site for these species? Yes – Stag beetle	√	
Other features of nature conservation interest		
Does the application site support Habitats of Principal Importance or Local Biodiversity Action Plan Priority Habitats? Yes, Rivers and streams and plantation woodland	√	
Does the application site support Species of Principal Importance or Local Biodiversity Action Plan Species? Yes, Water vole	√	
Have details of biodiversity enhancements been included with the application?	√	
Recommendations	Yes	No
Are further surveys recommended to inform the ecological impact assessment?	√	
Trees have been identified with potential to support roosting bats at TN1 and in the plantation woodland to the north of the site. These trees will be retained within the final design. However, if this not possible, then the following surveys will be recommended: Bat emergence / swarming surveys Whilst it appears that works have commenced as the site is dominated by bare ground, there was no construction underway at the time of the site visit. Therefore if construction does not commence within 12 months of this survey (i.e. by March 2016) then a brief update survey for badgers is recommended to confirm their continued absence from the site.		
Is mitigation (including avoidance/compensation) recommended?	√	
- Buffer zone: the 10m stand off from the stream should be clearly demarcated during works to ensure that it remains undisturbed during site clearance and construction. - Nesting birds: All vegetation clearance (i.e. strimming) to take place between October and February where possible. If this is not possible, then a thorough check for nesting birds should be made prior to site clearance by an ecologist. If any active nests are found, they must remain in situ until all the young have fledged. - Stag beetles: Any dead wood is to be retained in the broadleaf woodland plantation, away from the works area.		
Is enhancement recommended?	√	



Land adjacent to Langstone Technology Park

Preliminary Ecological Appraisal (Update)

- Buffer zone: it is recommended that the stream buffer zone continues to support a mosaic of habitats to include some grassland, tall ruderal and scrub habitats to allow those invertebrates already using the site to remain along the river corridor. Plantation of native wetland species along the Lavant Stream will make it more suitable for invertebrates and water vole present. Trees along the bank will be cut back and maintained, outside of the breeding bird season (March- September inclusive), so as not to overshadow the wetland ground flora below.
- Birds: Enhancements for bats and birds can be easily incorporated into new developments and should be implemented in the final design. A series of box designs are provided in Appendix D.
- Bats: a list of bat-friendly plant species to encourage invertebrates, and hence bats to the garden is included in Appendix E and should be implemented into the final design.



Land adjacent to Langstone Technology Park

Preliminary Ecological Appraisal (Update)

1.0 Introduction

1.1 Background

WYG originally completed an Extended Phase 1 Habitat Survey on land adjacent to Langstone Technology Park, Havant, Hampshire, hereafter known as 'the site' in 2011. An update Preliminary Ecological Assessment to this survey was commissioned by Walsingham Planning in February 2015 to support a revision to the Reserved Matters application.

1.2 Site Location and General Description

The site is known locally as Bosmere Field, and was a playing field for Bosmere Junior School until 1999. It is centred at OS grid reference SU715057 and has an area of 1.05 ha. The site is located adjacent to Langstone Technology (LTP) Park just off the junction of the A27 and A3023 Langstone Road, and is surrounded by residential and industrial areas. The Lavant Stream runs down the western site boundary, this waterway is heavily culverted through the Havant area, and runs into Langstone Harbour. The area originally surveyed in 2011 has now been partially developed, and now supports bare ground at the northern end of the site, and hard standing with an industrial building (restaurant) present with associated car parking at the southern end. In addition, some plantation broadleaf woodland is present along the northern boundary with the A27, as well as areas of scrub hedgerow around the northern and eastern peripheries of the site.

1.3 Development Proposals

The proposed works are understood to comprise the construction of a hotel and associated car parking, which differ slightly from those plans already approved. Works already completed comprise the construction of a restaurant and associated car parking. A 10m standoff will be retained from the stream, and trees along the western boundary of the site along the Lavant Stream will be retained in the final development. Any other trees originally present within the site boundary have already been removed as part of the approved development footprint.



Land adjacent to Langstone Technology Park

Preliminary Ecological Appraisal (Update)

1.4 Survey and Reporting Objectives

The ecological investigations undertaken by WYG included the following objectives:

- An updated site survey in line with published methodology (CIEEM Guidelines for Preliminary Ecological Appraisal, 2013) to record habitat types and dominant vegetation present on the site. An appraisal of habitats for their suitability to support protected or notable species and invasive plant species; specifically;
- An assessment of the potential ecological constraints to the proposed works at the site and recommendations for further survey, avoidance, mitigation and enhancement where appropriate;
- An updated assessment of the site's suitability for reptiles;
- An update assessment of the status of previously identified disused badger setts and of any new badger activity, including any setts within the site boundary and within accessible areas within 30m of the site boundary;
- An updated assessment of the potential of all trees remaining on the site to support roosting bats; and
- A presence / likely absence water vole survey of Lavant Stream, including the portion of the stream within the site boundary and 50m sections either side of the site boundary;
- A comparison between the 2012 and the 2015 Landscape Proposal Plans.



Land adjacent to Langstone Technology Park

Preliminary Ecological Appraisal (Update)

2.0 Data Search

2.1 Data Search Methodology

In 2011, the time of the original extended phase 1 survey completed at land adjacent to Langstone Technology Park, a data search was requested and information was gathered from Hampshire Biodiversity Information Centre (HBIC), the ecological records database for Hampshire, regarding the presence of nature conservation designations and protected and notable species within 2km of the proposed development site. In addition, a search for designations was made of Natural England's interactive, web-based MAGIC (Multi Agency Geographic Information for the Countryside) database.

The data search covers:

- Statutory nature conservation designations, such as National Nature Reserves (NNRs) and Sites of Special Scientific Interest (SSSIs);
- Non-statutory nature conservation designations, such as Wildlife sites;
- Protected species, such as badgers, great crested newts and bats; and
- Notable species, such as those listed in the local Biodiversity Action Plan.

2.2 Data Search Results

For an overview of the location of the site in relation to the designated sites mentioned below, please see the maps resulting from the HBIC data consultation undertaken in 2011 (see Appendix C, WYG 2011, land adjacent to Langstone Technology Park: Extended phase 1 habitat survey). No subsequent data request has been made.

2.2.1 Statutory Sites – Internationally Designated

The Chichester and Langstone Harbours Special Protection Area (SPA) and RAMSAR site lies 676.5m south from the site. Solent Maritime Special Area of Conservation (SAC) lies 656.0m south of the site. Both the Chichester and Langstone Harbours lie to the south of the site and also either side of the A3023 Langstone Bridge.



Land adjacent to Langstone Technology Park

Preliminary Ecological Appraisal (Update)

The Solent Maritime Special Area of Conservation (SAC)

The Solent Maritime SAC is an internationally designated site covering the estuaries within the Solent, between the Isle of Wight and the mainland. Chichester and Langstone Harbours fall within this SAC. The site is designated for its coastal lagoons. The lagoons show a range of salinities and substrates, ranging from soft mud to muddy sand with a high proportion of shingle, which support a diverse fauna including large populations of three notable species: the nationally rare foxtail stonewort *Lamprothamnium papulosum*, the nationally scarce lagoon sand shrimp *Gammarus insensibilis*, and the nationally scarce starlet sea anemone *Nematostella vectensis*. More information is provided below from the Joint Nature Conservation Committee website (JNCC) accessed on the 4th March 2015

(<http://jncc.defra.gov.uk/protectedsites/sacselection/sac.asp?eucode=uk0030059>).

Estuaries

The Solent encompasses a major estuarine system on the south coast of England with four coastal plain estuaries (Yar, Medina, King's Quay Shore, Hamble) and four bar-built estuaries (Newtown Harbour, Beaulieu, Langstone Harbour, Chichester Harbour). The site is the only one in the series to contain more than one physiographic sub-type of estuary and is the only cluster site. The Solent and its inlets are unique in Britain and Europe for their hydrographic regime of four tides each day, and for the complexity of the marine and estuarine habitats present within the area. Sediment habitats within the estuaries include extensive estuarine flats, often with intertidal areas supporting eelgrass *Zostera* spp. and green algae, sand and shingle spits, and natural shoreline transitions. The mudflats range from low and variable salinity in the upper reaches of the estuaries to very sheltered almost fully marine muds in Chichester and Langstone Harbours. Unusual features include the presence of very rare sponges in the Yar estuary and a sandy 'reef' of the polychaete *Sabellaria spinulosa* on the steep eastern side of the entrance to Chichester Harbour.

Spartina swards (*Spartinion maritimae*)

Solent Maritime is the only site for smooth cord-grass *Spartina alterniflora* in the UK and is one of only two sites where significant amounts of small cord-grass *S. maritima* are found. It is also one of the few remaining sites for Townsend's cord-grass *S. x townsendii* and holds extensive areas of common cord-grass *Spartina anglica*, all four taxa thus occurring here in close proximity. It has additional historical and scientific interest as the site where *S. alterniflora* was first recorded in the UK (1829) and where *S. x townsendii* and, later, *S. anglica* first occurred.



Land adjacent to Langstone Technology Park

Preliminary Ecological Appraisal (Update)

Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*)

The Solent contains the second-largest aggregation of Atlantic salt meadows in south and south-west England. Solent Maritime is a composite site composed of a large number of separate areas of saltmarsh. In contrast to the Severn estuary, the salt meadows at this site are notable as being representative of the ungrazed type and support a different range of communities dominated by sea-purslane *Atriplex portulacoides*, common sea-lavender *Limonium vulgare* and thrift *Armeria maritima*. As a whole the site is less truncated by man-made features than other parts of the south coast and shows rare and unusual transitions to freshwater reedswamp and alluvial woodland as well as coastal grassland. Typical Atlantic salt meadow is still widespread in this site, despite a long history of colonisation by cord-grass *Spartina* spp.

Chichester and Langstone Harbours Special Protection Area (SPA) and Ramsar Site

The below information was obtained from the Solent European Marine Sites website, accessed on the 4th March 2015 (<http://www.solentems.org.uk>), and the JNCC website.

Chichester and Langstone Harbours SPA have been selected for the following:

- Regularly occurring Annex 1 species
- Importance for regularly occurring migratory species
- Importance for internationally important assemblage of waterfowl

Chichester and Langstone Harbours are located on the south coast of England in Hampshire and West Sussex. They are large, sheltered estuarine basins comprising extensive sand- and mud-flats exposed at low tide. The two harbours are joined by a stretch of water that separates Hayling Island from the mainland. Tidal channels drain the basin and penetrate far inland. The mud-flats are rich in invertebrates and also support extensive beds of algae, especially *Enteromorpha* species, and eelgrasses *Zostera* spp. The basin contains a wide range of coastal habitats supporting important plant and animal communities. The site is of particular significance for waterbirds, especially in migration periods and in winter. It also supports important colonies of breeding terns.

This site qualifies under Article 4.1 of the Directive (79/409/EEC) by supporting populations of European importance of species such as: terns *Sterna* spp., Little Egret (*Egretta garzetta*), Bar-tailed Godwit (*Limosa lapponica*). The site also qualifies under Article 4.2 of the Directive (79/409/EEC) by supporting populations



Land adjacent to Langstone Technology Park

Preliminary Ecological Appraisal (Update)

of European importance of migratory species such as: Ringed Plover (*Charadrius hiaticula*), Black-tailed Godwit (*Limosa limosa islandica*), and Dark-bellied Brent Goose (*Branta bernicla bernicla*).

The harbours also qualify Article 4.2 of the Directive (79/409/EEC) by regularly supporting an assemblage of at least 20,000 waterfowl.

Chichester and Langstone Harbours Ramsar site have been selected for the following:

- Criterion 1a: Internationally important wetland characteristic of the Atlantic biogeographical region
- Criterion 3a: Wetland regularly supporting 20 000 waterfowl species in favourable condition
- Criterion 3c: Wetland regularly supporting 1% or more of the individuals in a population of waterfowl species

2.2.2 Statutory Sites – Nationally Designated

Langstone Harbour Site of Special Scientific Interest (SSSI) and Chichester Harbour SSSI

Those areas covered by the international designations above are also covered by a national designation as a Site of Special Scientific Interest. Many of these SSSI units are currently in unfavourable condition for the following reasons, but are recovering (information from Natural England website, accessed on the 4th March 2015 http://www.sssi.naturalengland.org.uk/special/sssi/unit_details.cfm?situnt_id=1007446).

- Sea level rise and 'coastal squeeze'
- Changes in water level
- Disturbance to feeding and roosting birds

Warblington Meadow SSSI

Located approximately 1.5km to the east of Bosmere Field, Warblington Meadow SSSI comprises lowland neutral grassland, which is in unfavourable, recovering condition as it is now being managed under a Higher Level Stewardship Scheme in consultation with Natural England.



Land adjacent to Langstone Technology Park

Preliminary Ecological Appraisal (Update)

2.2.3 Statutory Sites – Locally Designated

West Hayling Local Nature Reserve (LNR)

Approximately 1.5km south of Bosmere Field, within Langstone Harbour, this LNR is a former oysterbed currently being managed for wildlife, and designated by Havant Borough Council under Section 21 of the National Parks and Access to the Countryside Act 1949. The partnership includes the Borough Council, County Council, RSPB and the Hampshire Wildlife Trust.

2.2.4 Non-statutory Sites

Sites of Nature Conservation Importance (SNCI)

HBIC highlighted a number of SNCIs within 2km of the proposed development, their location and selection criteria are summarised in the table below, they are also illustrated on the overview site plan (see Appendix C, 2011 WYG Extended phase 1 habitat survey report).

Name	NGR	Distance	Direction	Selection Criteria
Manor Farm A	SU70000610	1.5km	NW	Branta bernicla bernicla (Dark-bellied brent goose) [UKBAP]
Broadmarsh Playing Field	SU70020563	1.5km	W	Branta bernicla bernicla (Dark-bellied brent goose) [UKBAP]
Southmoor - Big Field (south edge)	SU70980487	1km	SW	
Southmoor Reserve	SU71200520	0.5km	SW	Carex divisa (Divided sedge) [NR]
Pyecroft's Meadow	SU71800370	2km	S	Branta bernicla bernicla (Dark-bellied brent goose) [UKBAP] Carex distans (Distant sedge) [CS] Ononis spinosa (Spiny restharrow) [CS] Salicornia europaea agg. (Common glasswort) [CR] Tripleurospermum maritimum (Sea mayweed)
East of Pyecroft's Meadow	SU71900370	2km	SE	Branta bernicla bernicla (Dark-bellied brent goose) [UKBAP]
Wade Court Park	SU71980531	0.5km	SE	Egretta garzetta (Little egret) [CR] - Colony
Langstone Mill Pond	SU72050500	0.9km	SE	Tilia platyphyllos (Large-leaved lime) [NS]
West of North Hayling B	SU72430394	2km	SE	Branta bernicla bernicla (Dark-bellied brent goose) [UKBAP]
Warblington Castle	SU72670544	1.25km	SE	Branta bernicla bernicla (Dark-bellied brent goose) [UKBAP]



Land adjacent to Langstone Technology Park

Preliminary Ecological Appraisal (Update)

Farm West				
Warblington Castle Farm East E	SU73300520	1.9km	SE	Branta bernicla bernicla (Dark-bellied brent goose) [UKBAP]
Warblington Castle Farm East D	SU73300560	1.9km	E	Branta bernicla bernicla (Dark-bellied brent goose) [UKBAP]
Conigar Point Meadows	SU73500530	2km	SE	Apium graveolens (Wild celery) [CS] Bromus arvensis (Field brome) [CI] Bupleurum tenuissimum (Slender hair's ear) [NR] Carex distans (Distant sedge) [CS] Salicornia europaea agg. (Common glasswort) [CR]

All of these sites are more than 0.5km from the Bosmere Field site.

Natural Areas

The site falls within the South Coast Plain and Hampshire Lowlands Natural Area 75. Natural areas are classified by Natural England. This classification describes the typical landscape and natural character of the area, but is non-statutory and acts as guidance for planning and conservation targeting purposes. Natural Areas are sub-divisions of England, each with a characteristic association of wildlife and natural features. They provide a way of interpreting the ecological variations of the country in terms of natural features, illustrating the distinctions between one area and another. Each Natural Area has a unique identity resulting from the interaction of wildlife, landforms, geology, land use and human impact.

The Coastal plain is described as being open, and often featureless, with the south-facing slopes of Portsdown Hill leading down to the coast, and supporting some high quality chalk grassland.

Ancient and Semi-Natural Woodland

No ancient woodland was identified in the search area.



Land adjacent to Langstone Technology Park

Preliminary Ecological Appraisal (Update)

2.2.5 Protected and Notable Species

Bats

HBIC returned records of nine bat species, almost all of which are from more than 0.5km away from the site:

- Serotine (*Eptesicus serotinus*), four records were provided for the wider area, although the precise location is unknown.
- Daubenton's bat (*Myotis daubentonii*), two records were provided for the wider area, although the precise location is unknown.
- Whiskered/Brandt's bat (*Myotis mystacinus*/*M. brandtii*). One record provided for the wider area, although its precise location is unknown.
- Noctule (*Nyctalus noctula*). One record was provided for 1.5km northwest of the site.
- Common pipistrelle (*Pipistrellus pipistrellus*), 8 records were provided, the closest of which was 0.4km from the site and is thought likely to relate to a roost within the residential area to the southeast of the site.
- Soprano pipistrelle (*Pipistrellus pygmaeus*), two records for approximately 1km to the west of the site.
- Brown long-eared bat (*Plecotus auritus*), one record from 0.7km northeast of the site.

A number of other records were submitted for bats, but were not distinguished to species level, the closest of these was approximately 0.5km from the site.

Birds

HBIC returned a large number of records for rare and notable bird species found within 2km of the proposed development site. However, the vast majority of these relate to wading and wintering birds within Langstone and Chichester Harbours.



Land adjacent to Langstone Technology Park

Preliminary Ecological Appraisal (Update)

The Solent Waders and Brent Goose Strategy by the Solent Waders and Brent Goose Strategy Steering Group (King, 2010), (<http://www.hwt.org.uk/pages/solent-waders-and-brent-geese-strategy.html>) has looked at wader use of grasslands around the Solent Harbours, and has made the following classifications of Bosmere Field:

- It is not currently considered to be used by waders or brent geese; and,
- It is not considered to be 'important' for these species in the future

The only record obtained within 0.5km of the site was for:

- Lesser spotted woodpecker (*Dendrocopos minor*), an RSPB Red List species, listed on the UK Biodiversity Action Plan (UKBAP) and Hampshire Biodiversity Action Plan (HBAP)

Those species recorded from the wider area and considered relevant to the site include:

- House sparrow (*Passer domesticus*), an RSPB Red List species
- Common bullfinch (*Pyrrhula pyrrhula*), a UK Biodiversity Action Plan Species
- Common starling (*Sturnus vulgaris*), a Red List species on the UK BAP
- Song thrush (*Turdus philomelos*), a Red List species on the UK and Hampshire BAP
- Common kingfisher (*Alcedo atthis*), listed on Annex I of the Birds Directive, and Schedule 1 of the Wildlife and Countryside Act 1981 (as amended).
- It is also worth noting that there are also records for black redstart (*Phoenicurus ochruros*) from the wider area, a Schedule 1 species, although no habitat suitable for this species currently exists on the site.

Great Crested Newts

- No records were received for great crested newt (*Triturus cristatus*) or other amphibians from the search area.



Land adjacent to Langstone Technology Park

Preliminary Ecological Appraisal (Update)

Reptiles

- There are 21 records for slow worm (*Anguis fragilis*) from the wider area, the closest of which is 0.7km to the northwest of the site.
- Three grass snake (*Natrix natrix*) records were obtained from the search area, the closest of which is 0.7km to the southeast of the site.
- One adder (*Vipera berus*) record was obtained from within the search area, although the exact location is not known.

Mammals

- Only one record was received for badger (*Meles meles*), from 1.5km northeast of the site.
- A single water vole (*Arvicola amphibius*) record was obtained, from the Lavant Stream, immediately adjacent to the site. *According to correspondence from the Hampshire County Ecologist (email dated 9th February 2015, there are confirmed records from 2013 of water vole from the banks of the Lavant within the application area.*
- No otter (*Lutra lutra*) records were received.
- A single hedgehog (*Erinaceus europaeus*) record exists from 0.8km north east of the site.

Invertebrates

The data search returned numerous of records for rare and notable invertebrates within the 2km search area.

- There are more than 30 records for stag beetle (*Lucanus cervus*) within the 2km search area, the closest of which is 0.36km to the northeast of the site. The stag beetle is listed on Annex II of the Habitats Directive (as a non-priority species). It is a nationally scarce UK BAP species, also listed on the Hampshire BAP, and Section 41 of the Natural Environment and Rural Communities Act 2006.
- Five records were obtained for cinnabar moth (*Tyria jacobaeae*) from the wider area, although again, the exact locations are not clear. The cinnabar is a UK BAP species, and listed under Section 41 of the Natural Environment and Rural Communities (NERC) Act 2006.



Land adjacent to Langstone Technology Park

Preliminary Ecological Appraisal (Update)

Large numbers of butterfly and moth records exist for the wider area, although all of these are from more than 0.5km away from the site.

Plants

Again, large number of notable and rare plant species were returned for the wider area. However, the only record from within 0.5km of the site is:

- Stream water crowfoot (*Ranunculus penicillatus*), relating to the Lavant Stream adjacent to the site. This is Hampshire Biodiversity Action Plan (HBAP) species.



Land adjacent to Langstone Technology Park

Preliminary Ecological Appraisal (Update)

3.0 Survey Methodology

3.1 Habitats

An updated extended Phase 1 habitat survey was conducted within the predicted zone of influence¹ on the 3rd March 2015. The vegetation and habitat types within the site were noted during the walkover survey in accordance with the categories specified for a Phase 1 Vegetation and Habitat Survey (Joint Nature Conservation Committee, 2003). Dominant plant species were recorded for each habitat present. See section 4.0 below for Survey Results. All areas of the site were investigated, including those parts that are not expected to be affected directly by the works but may be indirectly impacted upon.

3.2 Protected and Notable Species

The site was inspected for evidence of and its potential to support protected or notable species, especially those listed under the *Conservation of Habitats and Species Regulations 2010*, the *Wildlife & Countryside Act 1981* (as amended), including those given extra protection under the *Natural Environment and Rural Communities (NERC) Act 2006* and *Countryside & Rights of Way (CROW) Act 2000*, and listed on the UK and local Biodiversity Action Plans.

The following species were considered:

3.2.1 Bats

Trees present on the day of the update survey were appraised externally by an experienced ecologist from WYG for their suitability to support breeding, resting and hibernating bats using survey methods based on those outlined in the Bat Conservation Trust's *Bat Surveys: Good Practice Guidelines* (2007) and English Natures *Bat Mitigation Guidelines* (2004).

3.2.2 Badgers

The site was surveyed for evidence of badger setts or other badger activity such as paths, latrines or signs of foraging. Methodologies used and any setts recorded were classified according to published criteria

¹ **Zone of influence:** the area that may be affected by the biophysical changes caused by the activities associated with the development.



Land adjacent to Langstone Technology Park

Preliminary Ecological Appraisal (Update)

(Harris, Cresswell & Jefferies, 1989). A 30m buffer zone around the expected zone of influence was surveyed as recommended in English Nature's *Badgers and Development* (2002).

3.2.3 Great Crested Newts

The site was appraised for its suitability to support great-crested newts. The assessment was based on guidance outlined in the Joint Nature Conservation Committees' published *Herpetofauna Workers' Manual* (Joint Nature Conservation Committee, 2003) and the *Great Crested Newt Conservation Handbook* (Langton, Beckett & Foster, 2001).

As recommended by Natural England, the Oldham *et al.* (2000) Habitat Suitability Index (HSI) was applied to ponds on site and to those within 500m of the site, where access permitted; these were identified using Ordnance Survey maps and aerial images.

3.2.4 Reptiles

The site was appraised for its suitability to support reptiles. The assessment was based on guidance outlined in the Joint Nature Conservation Committees' published *Herpetofauna Workers' Manual* (Joint Nature Conservation Committee, 2003).

3.2.5 Otters

The Lavant Stream was assessed for its suitability to support otters. This assessment was based on guidance outlined in Chanin, P. (2003) *Monitoring the otter*.

3.2.6 Water Voles

Following methods set out in the *Water Vole Conservation Handbook* (Strachan & Moorhouse, 2006), an assessment of the Lavant Stream was undertaken to determine its suitability to support water voles and a search for evidence of activity was undertaken, including droppings, latrines, burrows, footprints and feeding lawns, of any areas considered suitable.

3.2.7 Dormice

The habitats present on the site were assessed for their suitability to support dormice in accordance with (Bright *et al.*, 2006).



Land adjacent to Langstone Technology Park

Preliminary Ecological Appraisal (Update)

3.2.8 Other Species

The site was also appraised for its suitability to support other protected or notable fauna including mammals, birds and invertebrates in accordance with the *Guidelines for Baseline Ecological Assessment* (Institute of Environmental Assessment, 1995). Evidence of any current or historical presence of such species was recorded.

3.3 Invasive Species

The site was searched for evidence of invasive plant species, such as Japanese knotweed (*Fallopia japonica*), Himalayan balsam (*Impatiens glandulifera*), giant hogweed (*Heracleum mantegazzianum*), horizontal cotoneaster (*Cotoneaster horizontalis*), rhododendron (*Rhododendron ponticum*) and floating pennywort (*Hydrocotyle ranunculoides*) (see Appendix B for full list).

3.4 Limitations

The optimal period for completing extended Phase 1 habitat surveys and water vole surveys is April to September. This survey was completed in March, just outside the optimal season, which could represent a slight limitation to the survey results, however, the previous Phase 1 survey took place in September 2011, within the optimal time period, and the results of the current survey build upon the findings of the earlier survey. As such, there is high confidence in the survey results.

Access was limited into the plantation woodland between the site and the A27 junction; however, a careful search was made for badger paths leading into the woodland area. No ponds were visible in the wider area using aerial photography and maps that had suitable habitat connectivity to the site.

To determine likely presence or absence of protected species usually requires multiple visits at suitable times of the year. As a result, this survey focuses on assessing the *potential* of the site to support species of note, which are considered to be of principal importance for the conservation of biodiversity with reference to the National Planning Policy Framework, especially those given protection under UK or European wildlife legislation.

This report cannot therefore be considered a comprehensive assessment of the ecological interest of the site. However, it does provide an assessment of the ecological interest present on the day of the visit and



Land adjacent to Langstone Technology Park

Preliminary Ecological Appraisal (Update)

highlights areas where further survey work may be recommended. Previous surveys completed by WYG 2011/ 2012 provide further confidence in the results of the survey.

The details of this report will remain valid for a period of two years (i.e. until March 2017). Beyond this period, if works have not yet been undertaken, it is recommended that a new review of the ecological conditions is undertaken.

4.0 Survey Results

4.1 Habitats

The habitats found within the site are shown on the phase 1 habitats plan provided in Appendix A.

4.1.1 Bare ground

At the time of the survey on 3rd March 2015, the northern half of the site comprises bare ground with low number of early succession ruderal plants present. Some piles of wood chippings are also present (TN4). The area is fenced along the northern boundary.



Photo 1 showing the northern half of the site as comprising mainly bare ground.



Photo 2 shows bare ground comprising the northern section of the site, with wood chipping piles (TN4) and early succession plant species present.

Since the previous phase 1 habitat survey carried out on 27th September 2011, the southern end of the site now comprises hard standing where development has commenced. At the time of the survey on 3rd March 2015 a restaurant and associated car parking had since been built.



Photo 3 shows the southern half of the site comprising majority hard standing with associated car parking and restaurant.

Bare ground is also present with some ruderal early succession plants and scrub present along the buffer zone at the western boundary of the site (see photo 3).

Land adjacent to Langstone Technology Park

Preliminary Ecological Appraisal (Update)

4.1.2 Buildings

A newly built industrial building (restaurant) comprising red brickwork is present within the southern half of the site with associated tarmac surfacing for car parking.



Photo 4 shows a newly constructed restaurant with associated car parking present along the southern boundary of the site.

4.1.3 Broadleaf Plantation Woodland

Broadleaf plantation woodland is present along the northern and eastern boundary and north of the site, supporting some mature trees that screen the A27 junction to the north of the site. Species present include

alder (*Alnus glutinosa*), semi-mature cherry (*Prunus* sp.), crack willow (*Salix fragilis*) and hawthorn (*Crataegus mogyna*). Although these trees have been planted to screen the A27 junction, they provide suitable habitat for many species, and fall within the Hampshire Biodiversity Action Plan Priority Habitat Classification (as provided in Appendix B of 2011 WYG Land adjacent to Langstone Technology Park extended phase 1 habitat survey report).



Photo 5 showing some semi mature trees present in the broadleaf woodland plantation north of the site.



Photo 6 shows the broadleaf plantation woodland beyond the fence line at the northern boundary of the site.

4.1.4 Scattered trees

A line of scattered trees are present running adjacent to the Lavant Stream, comprising mainly hawthorn and elder (*Sambucus nigra*). A notable gnarled hawthorn is present next to the Lavant Stream with some ivy covering. In addition, behind the fence line north east of the site, cheery trees connect to the broadleaf plantation woodland. All other scattered trees previously on site at the time of the previous extended phase 1 habitat survey in September 2011 have now been removed.

The potential for roosting bats and nesting birds is discussed below in section 4.2



Photo 7 shows the buffer zone, with a line of scattered trees along the Lavant Stream, forming the western border of the site.

4.1.5 Running water

The Lavant Stream is a slow flowing stream and runs along the eastern boundary of the site from a large culvert beneath the A27 and slip road, and leaves the site beneath the Langstone Technology Park access bridge. The stream is approximately 3m wide, and varies in depth from approximately 150mm to 300mm'. Although there is some silt in the culvert beneath the road, the majority of the stream where it runs along the site boundary is clear with a stoney bottom comprised of flints and chalk. Species present at the time of the update survey include chalk-stream water-crowfoot (*Ranunculus pseudofluitans*) growing in the centre of the stream, bramble (*Rubus* sp.) common ivy (*Hedera helix*) and stinging nettle (*Urtica dioica*), with few emergent plants including occasional stands of great willowherb (*Epilobium hirsutum*), water figwort

Land adjacent to Langstone Technology Park

Preliminary Ecological Appraisal (Update)

(*Scrophularia auriculata*), common bluebell (*Hyacinthoides non-scripta*), wavy bitter-cress (*Cardamine flexuosa*) and common feather moss (*Kindbergia praelonga*).



Photo 8 shows the slow flowing water of Lavant Stream located along the western boundary of the site.



Photo 9 shows the banks supporting scrub and bramble along the eastern bank and some scrub and emergent vegetation present along the western bank.

Land adjacent to Langstone Technology Park

Preliminary Ecological Appraisal (Update)



Photo 10 shows the western bank of the Lavant Stream comprising trees and herbaceous vegetation.



4.1.6 Scrub

Some areas of the site, particularly in the north of the site and along the western bank of the Lavant Stream have become overgrown with continuous scrub. Scattered scrub is present along the eastern bank of the Lavant Stream. In addition, common ivy provides a dense understory across the broadleaf plantation woodland, climbing some of the trees present.

Dense continuous scrub has been removed along the eastern periphery of the site since the original Phase 1 survey was carried out on the 27th September 2011.

4.1.7 Standing water

Adjacent to the fence line north of the site running from east to west just off site through the broadleaf plantation woodland lies a wet ditch measuring approximately 0.5m wide with pools of approximately 25mm deep standing water and some vegetation present.

4.2 Protected and Notable Species

4.2.1 Water vole

The habitat shows good potential to support water vole. In addition, approximately 14 fresh burrows were noted in the bank of the Lavant Stream, indicating current presence by water vole. Burrows were mostly located on the eastern bank where the bank provides more suitable herbaceous vegetation. The west facing bank is dominated and shaded by bramble and scrub vegetation providing sub optimal habitat. In addition, the stream is partially shaded on the eastern side by trees, predominantly hawthorn as well as crack willow. The bank is steeped in places, but does not exceed 35 degrees and soil is sufficiently soft to excavate burrows in. Habitat is not ideal in the form of bank side vegetation with negligible tall/luxuriant riparian plants present, however the survey was carried out on March 3rd, a sub optimal season for herbaceous plants. Clear slow flowing water and hard mud/clay bank substrate however provide ideal water vole habitat.

No latrines or feeding signs were found during the survey. This may be because the survey was undertaken out of the optimal time, in March, when water voles are predominantly underground and less active. Previous water vole surveys undertaken by WYG in 2012 in the optimal period have found breeding

territories/latrines. Therefore due to the presence of burrows at the time of the update survey on March 3rd 2015 and good habitat present, it is presumed water vole are currently present.



Photo 11 showing a water vole burrow in the substrate of the Lavant Stream located along the western boundary of the site.



4.2.2 Otter

A thorough search for evidence of otters was made along both banks of the Lavant Stream where it runs past the site. No evidence of otters such as spraint, feeding remains, footprints or potential holt locations was found. The stream is also culverted through parts of Havant. Given that the site is surrounded by residential and industrial developments, and busy roads, it is considered unlikely that otters are resident at the site. There are no records from the wider area and no further surveys are required for this species.

4.2.3 Badger

No evidence of badgers were recorded on the site. A disused badger sett with a number of holes was found at TN2 on the river bank below a hawthorn tree (see Appendix A, Figures for phase 1 plan). A disused badger sett was also found beneath a walnut tree at TN3. Approximately 10 holes were noted although most had collapsed showing no current signs of use by badger. Access was gained to 30m buffer around the site, although no further evidence was found. There are large holes present in the fence line, although no badger tracks were found and these holes are likely attributed to rabbits.

The plantation to the north of the site has some potential to support badger with a disused badger sett present in the plantation woodland itself and along the Lavant stream located along the western boundary of the site. However the immediate surrounding area with the A27 to the north and Restaurant with bare ground, hard standing and heavy disturbance road to the south is a barrier to the wider environment. As such the site and immediate surrounding areas is considered to be of **low potential** to foraging and commuting badgers as well as sett development by badgers.



Photo 12 shows the fence line. Adjacent to this lies a wet ditch with holes present through the fence line.

4.2.4 Bats

Roosting

The gnarled hawthorn with some ivy cover adjacent to the Lavant Stream (TN1) has some crevices present between the ivy and tree, however given its low height it is considered to have **low potential** for roosting bats.

On the day of the update survey on 3rd March 2015, all trees scheduled for removal had already been removed under the approved plans. The remaining trees (other than the gnarled hawthorn as discussed above) were considered to be too immature to support roosting bats, and did not have the cracks, crevices, peeling bark, or rot holes required by these species. The plantation broadleaf woodland to the north of the



site, although largely comprised of immature trees, did contain some sycamore trees with ivy covering that could have low potential to support roosting bats. A thorough inspection of the A27 slip road culvert, and the Langstone Technology Park access bridge was not completed for health and safety reasons. Both structures are off site by more than 20m and appeared to be well maintained with no visible cracks or crevices suitable for roosting bats.

Foraging and Commuting Bats

The site itself is dominated by bare ground, hard standing and buildings. The broadleaf plantation woodland north of the site and planted scrub hedgerow forming the northern and eastern periphery of the site provide limited linear features to the wider environment. As such there it is not considered the site will form an important bat commuting route. Due to development footprint and the abolition of grassland previously covering the majority of the site, there is currently limited potential for an invertebrate source on site for bats to forage and hence the site is considered to be of ***low potential*** for foraging and commuting bats.

Bats are however highly likely to be present in the wider area, particularly given the presence of the Lavant Stream running along the site boundary, which is likely to provide a corridor for feeding and commuting bats. The plantation broadleaf woodland and hedgerows on northern boundary of the site as well as the hedgerows North West running along the A27 provide suitable linear features for foraging and commuting bats. However, the site itself is likely to have low potential to foraging bats.

4.2.5 Breeding Birds

No bird nests were noted at the time of the survey; however the survey was carried out outside of the breeding bird season. The new building on site shows limited features in the form of eaves and ledges for building-dwelling nesting birds and is therefore considered to offer ***low potential*** to support nesting bird species.

Mature trees located in the northern boundary of the broadleaved plantation woodland, scattered trees and scrub located along Lavant stream, as well as planted native hedgerow surrounding the northern periphery of the site all show ***medium potential*** to support common species of nesting bird. In addition the bare ground of the site since development has commenced currently provides habitat for foraging birds in the



form of bare ground and upturned soil, and birds including pied wagtail (*Motacilla alba*), were observed foraging on the day of survey.

The banks of the stream are considered to be too shallow to support kingfisher nest holes, although there are records from the wider area.

4.2.6 Dormice

Although there are small patches of bramble present and hedgerows forming the northern and eastern peripheries of the site, given the isolation of the site within an urban area with high disturbance from main roads, the site is considered to offer **negligible potential** for dormouse. No records were provided from the wider area and no further surveys or mitigation is recommended.

4.2.7 Great Crested Newts

The site comprises mostly bare ground and hard-standing and hence the habitats are generally unsuitable to great crested newts. There is a ditch measuring approximately 0.5m wide with approximately 25mm depth of standing water and some vegetation present, situated just outside of the northern boundary of the site. However it holds little connectivity to the wider environment and no ponds have been found within 500m of the site according to the data search carried out for the original extended phase 1 in September 2011 by WYG. In addition, an HSI was conducted of the wet ditch and it is considered to be of **poor** suitability (HSI 0.20) for great crested newts. It is considered unlikely that great crested newts are present or will be affected by the development works. No further surveys are recommended for this species.

4.2.8 Reptiles

The habitat on site at this stage in the development comprises mainly bare ground, hard standing with scrub and hedgerow forming the north and east peripheral of the site, all having negligible suitability for reptiles. As a previous reptile survey was carried out in 2012 by WYG and no reptiles were found, and the habitat is considered less suitable at present than at the time of the survey, it is considered unlikely that reptiles are present. No further surveys are recommended for these species.

4.2.9 Invertebrates

The Lavant Stream does provide potential suitable refuge locations for white-clawed crayfish (*Austropotamobius pallipes*) beneath the rocks and stones on the river bottom, as well as being likely to



Land adjacent to Langstone Technology Park

Preliminary Ecological Appraisal (Update)

support prey items within the fast flowing clear water and clumps of aquatic plants. HBIC returned no records of white clawed crayfish in 2011. This may be due to the presence of the non-native signal crayfish (*Pacifastacus leniusculus*) in the Hayling Island area. Therefore, white-clawed crayfish are considered likely to be absent from the site, and no further surveys are recommended for this species.

No dragonflies or damselflies were recorded during the site visit, and no records were received for these species. No further surveys are recommended.

Dead wood is present on site, predominantly outside of the northern border in the broadleaf plantation woodland. In addition, piles of wood chippings on site on the bare ground at the time of the update extended phase 1 survey. This habitat provides **low potential** for stag beetles and records for stag beetle have been found within 2km of the site, the closest of which is 0.36km to the northeast of the site.



5.0 Ecological Impacts and Recommendations

5.1 Statutory and Non-statutory Sites

The site already has planning approval, and the current proposals have only slightly changed since the initial Reserved Matters application, as such, it is not considered that there will be any significant effects of the proposed development on the Internationally designated sites, either alone or in-combination with other existing and proposed developments in the wider area.

5.1.1 Statutory Sites

Chichester and Langstone Harbour is an internationally designated SPA and RAMSAR site and a designated SSSI site, and is located 676.5m south from the site. Solent Maritime is an internationally designated SAC, located 656.0m south of the site.

Water Quality

A 10m buffer will be retained during and post-construction between the Lavant Stream that lies along the western boundary of the site and the proposed development to ensure that no sediment enters the waterway, either as airborne particles or through water courses. Appropriate best practice methodologies will be employed during construction to ensure that no changes are made to sedimentation or water quality as a result of the proposed development. It is recommended that this **10m buffer zone is clearly demarcated** during construction to ensure that no works take place in proximity to the stream.

5.1.2 Non-Statutory Sites

All non-statutory sites were more than 0.5km from the proposed works area, and no direct or indirect impacts are anticipated as a result of the proposed hotel and restaurant construction.

5.2 Habitats

A comparison was made between the 2012 and 2015 Landscape Proposal Plans. In 2012, the plan mainly comprised both native and non native species along the river corridor of the western boundary with proposed species comprising common alder (*Alnus glutinosa*), pedunculate oak (*Quercus robur*) and contorted weeping willow (*Salix babylonica pekinensis*). This was amended for the 2015 Landscape



Proposal to include all native tree planting along the western boundary. Species comprise field maple (*Acer campestre*), (*Betula pendula*) and wild cherry (*Prunus avium*).

5.2.1 Scattered trees

Mature landscape trees on the boundary of the site, bordering the highway are to be retained. Any trees requiring removal to allow the development to proceed have already been removed under the approved scheme.

5.2.2 Broadleaved Plantation Woodland

The broadleaved plantation woodland falls within the Hampshire BAP Priority Habitat classification for 'woodlands' and is highlighted as such on the BAP priority habitat map provided by HBIC in (see Appendix B, WYG 2011 Land adjacent to Langstone Technology Park: Extended phase 1 habitat survey). As the broadleaf plantation woodland lies beyond the site boundary, no further woodland is needed to be removed and as such will not be affected by the development proposal.

5.2.3 Scrub

Scrub is again a common and widespread habitat, providing a food and shelter resource for species such as rabbits, invertebrates and nesting birds, and considered to be of value at the local level only. No further clearance is required and as such will not be affected by the development proposal.

5.2.4 Rivers and streams

Rivers and streams are also Hampshire Biodiversity Action Plan Habitats. The retention of a 10m buffer along the Stream will ensure the maintenance of natural habitats within the development site. The Lavant Stream has been found to support water vole and chalk stream water crowfoot, as well as providing potentially suitable habitat for species such as white-clawed crayfish, kingfisher and otter. The river corridor is likely to act as a foraging and commuting resource for bats. As Lavant Stream lies beyond the site boundary, as long as the 10m buffer which the current masterplan shows it to be (Drawing No. 3654/P2 Revision D 'Proposed Site Plan') is retained throughout the development, Lavant Stream and the associated species should not be affected by the development. It is recommended that the 10m buffer is fenced off from construction to avoid. All works on site should be undertaken following best practice methodologies to avoid sedimentation of water ways and to ensure that there are no changes to sedimentation or water quality as a result from the proposed works. With the 10m buffer in place it is considered a sufficient



distance to prevent any sediment entering the waterway, either as airborne particles or through water courses.

5.3 Protected and Notable Species

5.3.1 Bats

Breeding, Resting and Hibernating Bats

All species of British bats and their roosts are fully protected under the *Wildlife & Countryside Act 1981* (as amended) and the *Conservation of Habitats and Species Regulations 2010* (see Appendix B).

Trees scheduled for removal have already been removed under the approved plans, and all other trees are being retained. The only trees with some (low) potential for roosting bats were the gnarled hawthorn at TN1, and some of the ivy covered trees in the plantation woodland at the north of the site. It is understood that these trees will be retained within the final development; therefore no further surveys are required. However, if plans change and they are required to be removed, then it is recommended that a detailed assessment for bats is made of the trees to be removed, and further nocturnal emergence / swarming surveys may be required to determine the likely presence or absence of roosting bats. These surveys can only take place between May and mid-September of any given year.

Enhancements for bats can be easily incorporated into new developments, and a series of bat box designs are provided in Appendix D, recommendations for planting schemes that can benefit bats are also provided in Appendix E.

Foraging and Commuting Bats

ODPM 06/2005: Biodiversity and Geological Conservation, the circular that accompanied the now redundant Planning Policy Statement 9 (PPS9) but which itself is still valid, requests that mitigating for impacts caused by developments to foraging and commuting routes should be considered when determining planning applications.

The cleared land within the proposed development area is considered to have negligible value to foraging and commuting bats and the minor changes proposed to the approved scheme are considered extremely unlikely to impact these species.



Large numbers of bat records were received from the wider area, some of which are considered to relate to roosts. The site as a whole is considered to have some local value to foraging bats, while the river corridor is likely to provide a high quality commuting and foraging route.

To ensure the river and mature trees remain as dark corridors within the landscape, it is recommended that any lighting used during construction, or in the final use of the site is angled avoid these features. In addition, low sodium bulbs are to be used with directional hoods to reduce light spillage.

If required to enhance the final development for bats, a list of bat-friendly plant species is included in Appendix E.

5.3.2 Badgers

Badgers and their setts are protected under the *Protection of Badgers Act 1991* and *Planning Policy Statement 9* (PPS9) (see Appendix B) stipulates that considering their welfare and mitigating for damage to their habitat are material considerations when considering planning applications.

No evidence badgers were found on site at the time of the survey, although a largely collapsed badger sett, not in current use was found in the north of the site below a walnut tree at TN3 and a disused sett located along the Lavant Stream at TN2, both located outside of the site boundary. It is considered unlikely that badgers would move back into the abandoned sett, given the high levels of human disturbance on the site, and the isolated nature of the site, with very little foraging resource available outside the site boundary, with the exception of the amenity grassland around the Langstone Technology Park. Therefore, badgers are not currently believed to be using the site, and as such are not considered to represent a constraint to works. No further surveys are recommended.

5.3.3 Reptiles

All species of native reptiles are under the *Wildlife and Countryside Act 1981* (as amended) (the sand lizard *Lacerta agilis* and smooth snake (*Coroenella austriaca*) are further protected under *Conservation of Habitats and Species Regulations 2010* (as amended).

The habitats present within the site were considered unsuitable to support reptiles, and reptile presence/absence surveys completed in 2012 found no reptiles on site. No further surveys are recommended.



5.3.4 Otters, Water Vole and White-Clawed Crayfish

Otter

The otter and its habitat are protected under *Wildlife and Countryside Act 1981* (as amended) and the *Conservation of Habitats and Species Regulations 2010* (as amended). The European sub-species is listed as globally threatened in the IUCN Red List (see Appendix B).

It is considered unlikely that otters make use of the Lavant Stream, as it is a relatively small water course, and would not provide enough prey to support an otter. Otters moving through are also considered unlikely, given the highly developed nature of the surrounding habitats. No further action for this species is recommended.

Water vole

Water vole and their habitat are protected under *Wildlife and Countryside Act 1981* (as amended) (see Appendix B).

As approximately 14 water vole burrows were found during the update phase 1 survey on 3rd March 2015 and water vole feeding signs and latrines have recorded at the Lavant Stream during the water vole and otter survey undertaken by WYG in 2013, it is recommended a buffer of at least 10m is retained between the stream and the proposed works area, to ensure that no sediment enters the waterway, either as airborne particles or through water courses. Appropriate best practice methodologies should be employed during construction to ensure that no changes are made to sedimentation or water quality as a result of the proposed development. The buffer zone must be clearly demarcated during construction to ensure that no works take place in proximity to the stream.

In addition, to mitigate for the increased disturbance that the development will produce, it is recommended that native wetland plants will be planted along the bank to increase the suitability of the habitat for water vole. Trees along the bank should be cut back and maintained, outside of the breeding bird season (March-August inclusive), so as not to overshadow the wetland ground flora below which will create sub-optimal habitat for water vole.

White-clawed crayfish



The white-clawed crayfish is protected under the *Wildlife and Countryside Act 1981* (as amended) (see Appendix B). No records were found for white-clawed crayfish in the area and no further surveys are recommended.

5.3.5 Other Species

Birds

All nesting birds are protected from disturbance whilst nesting by the *Wildlife and Countryside Act 1981* (as amended) (see Appendix B). Therefore it is recommended that if any further vegetation clearance is required, this is to take place out of the breeding bird season (which extends between March and September inclusive in any given year). If this is not possible, it is recommended that if any further trees are to be removed, these are checked for active bird nests by a suitably experienced ecologist prior to works commencing. Should any active bird nests be found, the immediate area containing the nest, plus a 5m buffer zone around the nest must be retained until all of the young have fledged and cease to return to the nest.

It is recommended that all remaining mature trees, scrub and hedgerow will be retained on and immediately off site including scrub along the Lavant Stream and maintained appropriately in the development outside of the breeding bird season.

In addition, as a potential enhancement for nesting birds, bird boxes should be installed on buildings and trees post development to provide additional nesting habitat.

Hedgehogs

Hedgehogs are a UK BAP species known to be present in the wider area. The site now offers low suitability for foraging and hibernation for hedgehog (*Erinaceus europaeus*) in the form of hedgerows forming the northern and eastern boundaries of the site. However with the barrier of the A27 to the wider environment it is considered unlikely hedgehogs will make use of the habitats available at the site. Care should be taken however during any further site clearance to search for hedgehogs, and if any are found they should be moved to the northern or western sides of the site away from the works area.

Invertebrates

A number of invertebrate species are protected under the *Wildlife and Countryside Act 1981* (as amended) and the *Conservation of Habitats and Species Regulations 2010* (as amended), and large numbers of



protected species records were obtained from the data search. Most of the rare species known from the wider area would not occur within common and widespread habitats found at the Bosmere Field site.

Assuming that the buffer zone is retained along the stream, this will retain areas of the existing habitat including ragwort that can support those species currently using the site. It is also recommended that this area is managed to allow the continuation of a mosaic of habitats along the stream to include some grassland, tall ruderal and scrub habitats.

Numerous records were obtained for stag beetle from the wider area. The stag beetle is a globally threatened species, listed on Annex II of the Habitats Directive (as a non-priority species). It is a nationally scarce UK BAP species, also listed on the Hampshire BAP. A lack of 'dead wood' is considered the main reason for its decline, as eggs are laid in soil around dead wood, so that the larvae can feed on it, for up to seven years. Dead wood was recorded on the site predominantly in the broadleaf plantation woodland north of the site. Should any dead wood require removal during works, it is recommended that it be placed in the retained sections of the site, the plantation to the north, or the river buffer to the west to provide potential habitat to this species.



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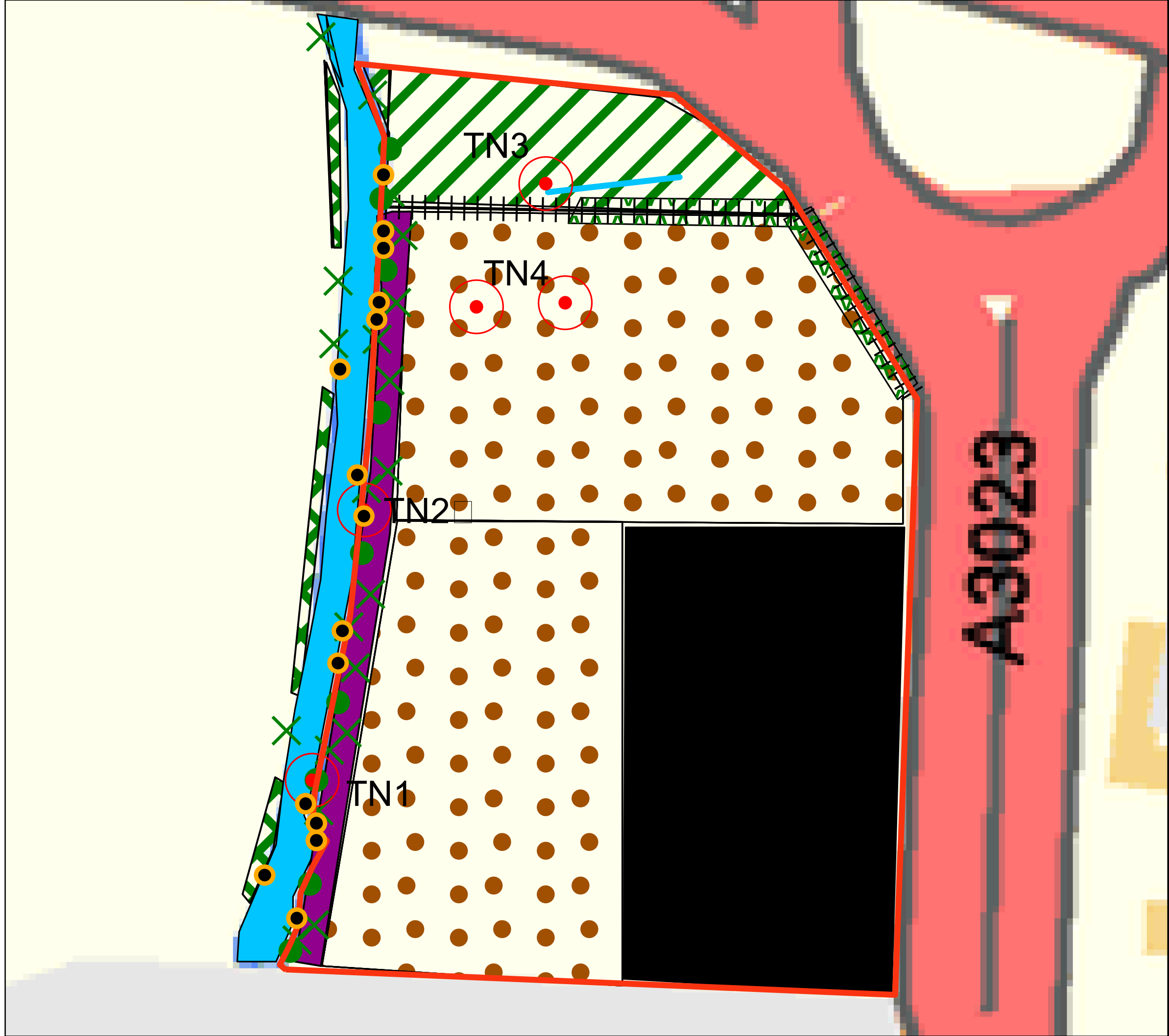
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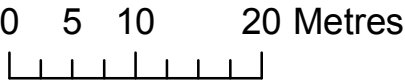


Appendix A - Figures



Legend

- Water vole burrow
- Site boundary
- Target note
- Scattered scrub
- Tree
- Fence
- Wet ditch
- Hedgerow
- Buffer zone
- Running water
- Building
- Bare ground
- Continuous scrub
- Broadleaf plantation



The Pavillion, 1st Floor
Botleigh Grange Office Campus
Hedge End
Southampton
Hants
SO30 2AF

Tel: 01489 872929
Fax: 01489 872939
email: ecology@wyg.com



WYG Environment

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Land adjacent to Langstone Technology Park

Update Extended Phase 1 Habitat Survey

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Base map provided by Ordnance Survey



Appendix B – Biodiversity and Environmental Legislation, Conventions & Threatened Lists

Introduction

The UK has ratified a number of Conventions and implemented legislation pertaining to the protection of biodiversity and habitats, either independently or as member state of the European Union. These are defined and summarised below.

Lists of threatened, endangered and extinct species are also provided, together with a summary explanation of each.

Bern Convention (1982)

The *Convention on the Conservation of European Wildlife and Natural Habitats* (the *Bern Convention*) was adopted in Bern, Switzerland in 1979, and was ratified in 1982. Its aims are to protect wild plants and animals and their habitats listed in Appendices 1 and 2 of the Convention, and regulate the exploitation of species listed in Appendix 3. The regulation imposes legal obligations on participating countries to protect over 500 plant species and more than 1000 animals.

To meet its obligations imposed by the Convention, the European Community adopted the *EC Birds Directive* (1979) and the *EC Habitats Directive* (1992 – see below). Since the Lisbon Treaty, in force since 1st December 2009, European legislation has been adopted by the European Union.

Biodiversity Action Plan (BAP)

The UK *Biodiversity Action Plan* (UKBAP – UK Steering Group, 1995; UK Biodiversity Group, 1998 - 2000) lists and prioritises habitats and species and sets national targets to be achieved. The intent of the UKBAP, however, is much broader than the protection and enhancement of less common species, and is meant to embrace the wider countryside as a whole.

The UKBAP has recently undergone a review (Biodiversity Reporting and Information Group, June 2007) resulting in the identification of 391 'Priority' Species Action Plans (SAPs), 45 'Priority' Habitat Action Plans and 162 Local Biodiversity Action Plans.

Local Biodiversity Action Plans (LBAP) identify habitat and species conservation priorities at a local level (typically at the County level), and are usually drawn up by a consortium of local Government organisations and conservation charities.

Birds Directive (BD)

The *EC Directive on the Conservation of Wild Birds* (791409/EEC) or '*Birds Directive*' was introduced to achieve favourable conservation status of all wild bird species across their distribution range. In this context, the most important provision is the identification and classification of Special Protection Areas (SPAs) for rare or vulnerable species listed in Annex 1 of the Directive, as well as for all regularly occurring migratory species, paying particular attention to the protection of wetlands of international importance.

Birds of Conservation Concern (BoCC)

This is a review of the status of all birds occurring regularly in the United Kingdom. It is regularly updated and is prepared by leading bird conservation organisations, including the British Trust for Ornithology (BTO), Joint Nature Conservation Committee (JNCC) and The Royal Society for the Protection of Birds (RSPB).

The latest report was produced in 2009 (Eaton *et al*, 2009) and identified 52 red list species, 126 amber species, and 68 green species. The criteria are complex, but generally:

- Red list species are those that have shown a decline of the breeding population, non-breeding population or breeding range of more than 50% in the last 25 years.
- Amber list species are those that have shown a decline of the breeding population, non-breeding population or breeding range of between 25% and 50% in the last 25 years. Species that have a UK breeding population of less than 300 or a non-breeding population of less than 900 individuals are also included, together with those whose 50% of the population is localised in 10 sites or fewer and those whose 20% of the European population is found in the UK.
- Green list species are all regularly occurring species that do not qualify under any of the red or amber criteria are green listed

Bonn Convention

The Convention on the Conservation of Migratory Species of Wild Animals or '*Bonn Convention*' was adopted in Bonn, Germany in 1979 and came into force in 1985. Participating states agree to work together to preserve migratory species and their habitats by providing strict protection to species listed in Appendix I of the Convention. It also establishes agreements for the conservation and management of migratory species listed in Appendix II.

In the UK, the requirements of the convention are implemented via the *Wildlife & Countryside Act 1981* (as amended), *Wildlife (Northern Ireland) Order 1985*, *Nature Conservation and Amenity Lands (Northern Ireland) Order 1985* and the *Countryside and Rights of Way Act 2000* (CRoW).

Global IUCN Red List

The International Union for Conservation of Nature (IUCN) Threatened Species was devised to provide a list of those species that are most at risk of becoming extinct globally. It provides taxonomic, conservation status and distribution information about threatened taxa around the globe.

The system catalogues threatened species into groups of varying levels of threat, which are: Extinct (EX), Extinct in the Wild (EW), Critically Endangered (CE), Endangered (EN), Vulnerable (VU), Near Threatened (NT), Least Concern (LC), Data Deficient (DD), Not Evaluated (NE). Criteria for designation into each of the categories is complex, and consider several principles.

Habitats Directive

The *Council Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Fauna and Flora*, or the '*Habitats Directive*', is a European Union directive adopted in 1992 in response to the Bern Convention. Its aims are to protect approximately 220 habitats and 1,000 species listed in its several Annexes.

In the UK, the *Habitats Directive* is transposed into national law via the *Conservation of Habitats and Species (Amendment) Regulations 2012* in England, Scotland and Wales, and via the *Conservation (Natural Habitats, &c) Regulations (Northern Ireland) 1995 (as amended)* in Northern Ireland.

Protection of Badgers Act 1992 (PBA 1992)

The main legislation protecting badgers in England and Wales is the *Protection of Badgers Act 1992* (the 1992 Act). Under the 1992 Act it is an offence to: wilfully kill, injure, take or attempt to kill, injure or take a badger; dig for a badger; interfere with a badger sett by, damaging a sett or any part thereof, destroying a sett, obstructing access to a sett, causing a dog to enter a sett or disturbing a badger while occupying a sett.

The 1992 Act defines a badger sett as: "any structure or place which displays signs indicating current use by a badger"

National Planning Policy Framework (2012)

Following the publication of the National Planning Policy Framework (NPPF) in March 2012, *Planning Policy Statement 9 (PPS9): Biodiversity and Geological Conservation (2005)* has been withdrawn. However, *ODPM 06/2005: Biodiversity and Geological Conservation – Statutory Obligations and their impact within the Planning System* (the guidance document that accompanied PPS9) has not been withdrawn and, where more detailed guidance is required than is given within the NPPF, local planning authorities will continue to rely on ODPM 06/2005.

This guidance requires local planning authorities to take account of the conservation of protected species when determining planning applications and makes the presence of a protected species a material consideration when assessing a development proposal that, if carried out, would be likely to result in harm to the species or its habitat.

In the case of European Protected Species such as bats, planning policy emphasises that strict statutory provisions apply (including the *Conservation of Habitats and Species (Amendment) Regulations 2012*), to which a planning authority must have due regard.

Where developments requiring planning permission are likely to impact upon protected species it is necessary that protected species surveys are undertaken and submitted to meet the requirements of paragraph 98 of ODPM Circular 06/2005 which states that:

'The presence of a protected species is a material consideration when a planning authority is considering a development proposal that, if carried out, would be likely to result in harm to the species or its habitat.'

General guidance within the body of the NPPF which are also potentially relevant to the possible presence of bats at the site includes the following statements:

"The planning system should contribute to and enhance the natural and local environment by:

- protecting and enhancing valued landscapes, geological conservation interests and soils;*
- recognising the wider benefits of ecosystem services;*
- minimising impacts on biodiversity and providing net gains in biodiversity where possible, contributing to the Government's commitment to halt the overall decline in biodiversity,*

including by establishing coherent ecological networks that are more resilient to current and future pressures"

"Local planning authorities should set criteria based policies against which proposals for any development on or affecting protected wildlife or geodiversity sites or landscape areas will be judged."

"When determining planning applications, local planning authorities should aim to conserve and enhance biodiversity by applying the following principles:

- if significant harm resulting from a development cannot be avoided (through locating on an alternative site with less harmful impacts), adequately mitigated, or, as a last resort, compensated for, then planning permission should be refused;"*

Species of Principal Importance in England

Section 41 (S41) of this Act requires the Secretary of State to publish a list (in consultation with Natural England) of habitats and species which are of principal importance for the conservation of biodiversity in England. The S41 list is used to guide decision-makers such as public bodies including local and regional authorities, in implementing their duty under Section 40 of the *Natural Environment and rural Communities (NERC) Act 2006*, to have regard to the conservation of biodiversity in England, when carrying out their normal (e.g. planning) functions. The S41 list includes 65 habitats of principal importance and 1,150 species of principal importance.

The Conservation of Habitats and Species (Amendment) Regulations 2012

The *Conservation of Habitats and Species (Amendment) Regulations 2012* came into force on 16th August 2012 and amend the *Conservation of Habitats and Species Regulations 2010* to ensure the various provisions of Directive 92/43/EC ('the Habitats Directive') are transposed in a clear manner.

Regulations place a duty on the Secretary of State to propose a list of sites which are important for either habitats or species (listed in Annexes I or II of the Habitats Directive respectively) to the European Commission. These sites, if ratified by the European Commission, are then designated as Special Protection Areas (SPAs) within six years. The 2012 amendments include that public bodies help preserve, maintain and re-establish habitats for wild birds.

The Regulations also make it an offence to deliberately capture, kill, disturb or trade in the animals listed in Schedule 2, or pick, uproot, destroy, or trade in the plants listed in Schedule 5 (see Table B1).

Table B1 Schedules of the Conservation of Habitats and Species (Amendment) Regulations 2012

Schedule 2 – European Protected Species of Animals		Schedule 5 – European Protected Species of Plant	
Common name	Scientific name	Common name	Scientific name
Horseshoe bats	Rhinolophidae - all species	Dock, Shore	<i>Rumex rupestris</i>
Common bats	Vespertilionidae - all species	Killarney Fern	<i>Trichomanes speciosum</i>
Wild Cat	<i>Felis silvestris</i>	Early Gentian	<i>Gentianella anglica</i>
Dolphins, porpoises and whales	Cetacea – all species	Lady’s-slipper	<i>Cypripedium calceolus</i>
Dormouse	<i>Muscardinus avellanarius</i>	Creeping Marshwort	<i>Apium repens</i>
Pool Frog	<i>Rana lessonae</i>	Slender Naiad	<i>Najas flexilis</i>
Sand Lizard	<i>Lacerta agilis</i>	Fen Orchid	<i>Liparis loeselii</i>
Fisher’s Estuarine Moth	<i>Gortyna borelii lunata</i>	Plantain, Floating-leaved water	<i>Luronium natans</i>
Newt, Great Crested	<i>Triturus cristatus</i>	Yellow Marsh Saxifrage	<i>Saxifraga hirculus</i>
Otter	<i>Lutra lutra</i>		
Lesser Whirlpool Ram’s-horn Snail	<i>Anisus vorticulus</i>		
Smooth Snake	<i>Coronella austriaca</i>		
Sturgeon	<i>Acipenser sturio</i>		
Natterjack Toad	<i>Bufo calamita</i>		
Marine Turtles	<i>Caretta caretta</i> , <i>Chelonia mydas</i> , <i>Lepidochelys kempii</i> , <i>Eretmochelys imbricata</i> , <i>Dermochelys coriacea</i>		

The Hedgerow Regulations 1997

The *Hedgerow Regulations 1997* were made under Section 97 of the *Environment Act 1995* and came into force in 1997. They introduced new arrangements for local planning authorities in England and Wales to protect important hedgerows in the countryside, by controlling their removal through a system of notification. Important hedgerows are defined by complex assessment criteria, which draw on biodiversity features, historical context and the landscape value of the hedgerow.

Wildlife and Countryside Act 1981 (as amended)

This is the principal mechanism for the legislative protection of wildlife in the UK. This legislation is the chief means by which the '*Bern Convention*' and the *Birds Directive* are implemented in the UK. Since it was first introduced, the Act has been amended several times.

The Act makes it an offence to (with exception to species listed in Schedule 2) intentionally:

- kill, injure, or take any wild bird,
- take, damage or destroy the nest of any wild bird while that nest is in use, or
- take or destroy an egg of any wild bird.

In addition, the Act makes it an offence (subject to exceptions) to:

- intentionally or recklessly kill, injure or take any wild animal listed on Schedule 5,
- interfere with places used for shelter or protection, or intentionally disturbing animals occupying such places.
- The Act also prohibits certain methods of killing, injuring, or taking wild animals

Finally, the Act also makes it an offence (subject to exceptions) to:

- intentionally pick, uproot or destroy any wild plant listed in Schedule 8, or any seed or spore attached to any such wild plant,
- unless an authorised person, intentionally uproot any wild plant not included in Schedule 8,

- sell, offer or expose for sale, or possess (for the purposes of trade), any live or dead wild plant included in Schedule 8, or any part of, or anything derived from, such a plant.

Following all amendments to the Act, Schedule 5 'Animals which are Protected' contains a total of 154 species of animal, including several mammals, reptiles, amphibians, fish and invertebrates. Schedule 8 'Plants which are Protected' of the Act, contains 185 species, including higher plants, bryophytes and fungi and lichens. A comprehensive and up-to-date list of these species can be obtained from the JNCC website.

Part 14 of the Act makes unlawful to plant or otherwise cause to grow in the wild any plant which is listed in Part II of Schedule 9.

Table B2 provides a comprehensive list of plant species listed in this schedule. It is recommended that plant material of these species is disposed of as bio-hazardous waste, and these plants should not be used in planting schemes.

Table B2 Invasive plant species listed in Schedule 9 of the *Wildlife & Countryside Act 1981* (as amended)

Common name	Scientific name
Perfoliate alexanders	<i>Smyrniium perfoliatum</i>
Red algae	<i>Grateloupia luxurians</i>
Variagated yellow archangel	<i>Lamiastrum galeobdolon</i> subsp. <i>argentatum</i>
Yellow azalea	<i>Rhododendron luteum</i>
Himalayan balsam	<i>Impatiens glandulifera</i>
Cotoneaster	<i>Cotoneaster horizontalis</i>
Entire-leaved cotoneaster	<i>Cotoneaster integrifolius</i>
Himalayan cotoneaster	<i>Cotoneaster simonsii</i>
Hollyberry cotoneaster	<i>Cotoneaster bullatus</i>
Small-leaved cotoneaster	<i>Cotoneaster microphyllus</i>
False Virginia creeper	<i>Parthenocissus inserta</i>
Virginia creeper	<i>Parthenocissus quinquefolia</i>
Purple dewplant	<i>Disphyma crassifolium</i>
Fanwort or Carolina water-shield	<i>Cabomba caroliniana</i>
Water fern	<i>Azolla filiculoides</i>
Hottentot fig	<i>Carpobrotus edulis</i>
Three-cornered garlic	<i>Allium triquetrum</i>
Giant hogweed	<i>Heracleum mantegazzianum</i>

Amberley Drive, Worthing: Extended Phase 1 Habitat Survey

Common name	Scientific name
Water hyacinth	<i>Eichhornia crassipes</i>
Giant kelp	<i>Macrocystis</i> spp.
Giant knotweed	<i>Fallopia sachalinensis</i>
Hybrid knotweed	<i>Fallopia japonica</i> × <i>Fallopia sachalinensis</i>
Japanese knotweed	<i>Fallopia japonica</i>
Few-flowered garlic	<i>Allium paradoxum</i>
Water lettuce	<i>Pistia stratiotes</i>
Parrot's-feather	<i>Myriophyllum aquaticum</i>
Floating pennywort	<i>Hydrocotyle ranunculoides</i>
Duck potato	<i>Sagittaria latifolia</i>
Floating water primrose	<i>Ludwigia peploides</i>
Water primrose	<i>Ludwigia grandiflora</i>
Water primrose	<i>Ludwigia uruguayensis</i>
Rhododendron	<i>Rhododendron ponticum</i>
Rhododendron	<i>Rhododendron ponticum</i> × <i>Rhododendron maximum</i>
Giant rhubarb	<i>Gunnera tinctoria</i>
Japanese rose	<i>Rosa rugosa</i>
Giant salvinia	<i>Salvinia molesta</i>
Green seafingers	<i>Codium fragile</i>
Californian red seaweed	<i>Pilea californica</i>
Hooked asparagus seaweed	<i>Asparagopsis armata</i>
Japanese seaweed	<i>Sargassum muticum</i>
Laver seaweeds (except native species)	<i>Porphyra</i> spp
Australian swamp stonecrop or New Zealand pygmyweed	<i>Crassula helmsii</i>
Wakame	<i>Undaria pinnatifida</i>
Curly waterweed	<i>Lagarosiphon major</i>
Waterweeds	<i>Elodea</i> spp.

Appendix C – Data Search Results

Appendix D – Wildlife Boxes

Introduction

The information in this appendix relates to bat and bird boxes that can be easily incorporated into building and landscape plans. The information provided is not exhaustive and provides examples of some of the types of boxes available.

Including bat and bird boxes throughout the development site has a number of benefits:

- Any roosting or resting places lost as a result of the work will be replaced;
- The ecological value of the site will be enhanced;
- Priority species within the UK and local Biodiversity Action Plans (BAPs) will be encouraged.

Bats

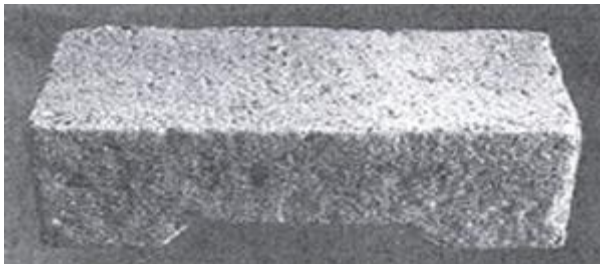
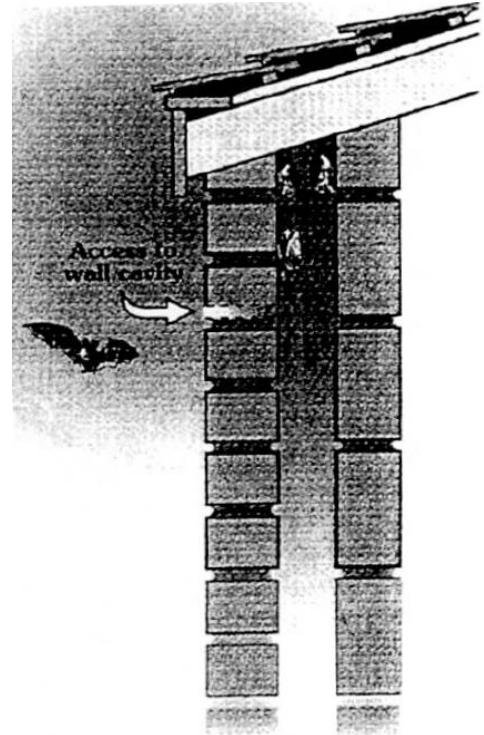
For Buildings

The inclusion of a variety of bat bricks, tubes and boxes for buildings is recommended to encourage a diversity of bat species. Bat bricks and tubes require no maintenance.

Bat Access and Roost Bricks

Source: Marshalls Clay Products (approved by the Bat conservation Trust)

'... Marshall Clay Products have been producing a Bat Access Brick specially designed to help the country's badly depleted bat population by provided access to wall cavities or roof spaces where most bat colonies tend to be (see diagram). In recent years bats have been declining at an alarming rate. Nearly all colonies tend to be on the outside of houses, in wall cavities, under slates, flashing or tiles, etc. ... Contrary to popular opinion, bats do not make pests and do absolutely no damage to buildings or roof timbers, indeed many people encourage bat colonies in their area because of the large number of insect pests, woodworm, etc. which they eat. Most colonises will use a house for only a few weeks in summer before dispersing in autumn.'



Marshall's Bat Access Brick, which is now also available in stone.

A Bat Brick should ideally be placed as high as possible at the gable apex or close to the soffit.

Marshalls Clay Products - Quarry Lane,
Howley Park, Woodkirk, Dewsbury, West
Yorkshire, WF12 7JJ – Tel: (01132) 203535,
Fax: (01132) 203555.

Bat Tube

Brick bat tubes are designed for buildings, or underneath bridges, arches or tunnels, where conditions are relatively humid. They are particularly useful for new buildings or bridges to attract bats, or to provide new roost sites where existing buildings with bats are being renovated.

This long box can be installed within brick masonry, beneath plasterwork or wood panelling, or incorporated into concrete structures such as factory buildings or bridges. Inside it contains a woodcrete surface, a roughened wood board, and a metal mesh, providing a choice of roosting areas depending on the weather conditions and the bats' habits. This box is maintenance-free as the entrance slit is at the bottom.

No painting required, but if painting is necessary a natural breathable paint should be used.

Width: 20cm; Height: 47.5cm; Depth: 12.5cm; Entrance Width: 15cm; Entrance Depth: 2cm; Weight: 13kg



Bat Box

This type of box is made of woodcrete and is expected to last approximately 25 years. It has a narrow crevice-like internal space to attract Pipistrelle and Noctule bats. Woodcrete (75% wood sawdust, concrete and clay mixture).

Width: 27cm; Height: 43cm; Weight: 8.3kg.



For Trees

Woodcrete boxes have the highest rates of occupation of all box types. The 75% wood sawdust, concrete and clay mixture allows natural respiration, stable temperature, and durability. They are long lasting (approx. 25 years) and are rot- and predator-proof. Hang from a tree branch near the trunk, or fix to a trunk with the supplied 'tree-friendly' aluminium nail. Attractive to smaller British bats.

Material: Woodcrete (75% wood sawdust, concrete and clay mixture); Diameter: 16cm; Height: 33cm; Weight: 4kg.



Bird Boxes

A variety of bird box designs could be installed throughout the development site to attract a diversity of species. Open fronted boxes will attract species such as robins, pied wagtails and spotted flycatchers, while boxes with entrance holes will attract tits, wrens and tree sparrows. Roost pockets will be used by roosting birds over the winter and by smaller species, such as wrens, for nesting in the spring.

Open Fronted Boxes

This box is attractive to robins, pied wagtails, spotted flycatcher, wrens and black redstarts and is best sited on the walls of buildings with the entrance on one side.

These woodcrete boxes are designed to mimic natural nest sites and provide a stable environment for chick rearing and winter roosting. They can be expected to last 25 years or more without maintenance.



Boxes with Entrance Holes

This box is attractive to smaller birds such as tits, wrens and tree sparrows. Sparrow terraces are also available.



Insect Boxes

As with the bat and bird boxes, a variety of insect boxes is recommended to encourage a diversity of species.

Wooden Insect House

A general insect habitat for beneficial insects in summer and, later in the year, overwintering ladybirds and lacewings. Locate in a sheltered place near nectar or pollen plants or by a pond.

Durable and strong construction in acacia, oak or larch with no maintenance necessary. Dimensions: 22 × 13.5 × 13.5cm.



Woodcrete Insect House

An insect nest made from long-lasting, insulating, woodcrete, with holes of different sizes providing homes for a variety of beneficial insects such as bees and solitary wasps.

Dimensions: 14 × 8 × 26cm; Weight: 3.65kg



Insect House with Inspection Tubes

This nesting and hibernation box for insects has a woodcrete exterior with a wooden front panel which can be removed for observation. Through the transparent tubes you can see the usually hidden lifecycle of many solitary types of bees and hymenoptera including egg-laying, development of larvae and sealing of brood chambers.

Typical inhabitants are wild bees and thread-waisted wasps. All the species attracted to this box are harmless non-aggressive pollinating insects. Dimensions: 33 × 21 × 51 cm; Weight: 7.1kg.



Appendix E – Wildlife-friendly Planting



Land adjacent to Langstone Technology Park

Preliminary Ecological Appraisal (Update)

Table E1 Shrub species of native origin or generally thought to be beneficial to wildlife

(Source: 'Gardening with wildlife in mind', Natural England, 2008)

Common name	Scientific name
Hazel	<i>Corylus avellana</i>
Elder	<i>Sambucus nigra</i>
Goat willow	<i>Salix caprea</i>
Hawthorn	<i>Crataegus monogyna</i>
Dog rose	<i>Rosa canina</i>
Butterfly bush	<i>Buddleia davidii</i>
Guelder rose	<i>Viburnum opulus</i>
Gorse	<i>Ulex europaeus</i>
Broom	<i>Cytisus scoparius</i>
Wayfaring tree	<i>Viburnum lantana</i>
Shrubby cinquefoil	<i>Potentilla fruticosa</i>
Raspberry	<i>Rubus idaeus</i>
Alder buckthorn	<i>Frangula alnus</i>
Wild privet	<i>Ligustrum vulgare</i>
Barberry	<i>Berberis × stenophylla</i>
Barberry	<i>Berberis vulgaris</i>
Bell heather	<i>Erica cinerea</i>
Bilberry	<i>Vaccinium myrtillus</i>
Black currant	<i>Ribes nigrum</i>
Blackthorn	<i>Prunus spinosa</i>
Buckthorn	<i>Rhamnus catharticus</i>
Butcher's-broom	<i>Ruscus aculeatus</i>
Cherry laurel	<i>Prunus laurocerasus</i>
Cowberry	<i>Vaccinium vitis-idaea</i>
Cross-leaved heath	<i>Erica tetralix</i>
New Zealand holly	<i>Olearia macrodonta</i>
Daphne	<i>Daphne odora</i>
Dogwood	<i>Cornus sanguinea</i>
Field rose	<i>Rosa arvensis</i>
Firethorn	<i>Pyracanthus angustifolia</i>
Flowering Currant	<i>Ribes sanguineum</i>
Gooseberry	<i>Ribes uva-crispa</i>
Hebe 'Midsummer Beauty'	<i>Hebe species</i>
Himalayan honeysuckle	<i>Leycesteria formosa</i>
Holly	<i>Ilex aquifolium</i>
Japanese quince	<i>Chaenomeles japonica</i>
Lilac	<i>Syringa vulgaris</i>
Mexican orange	<i>Choisya ternata</i>
Mezereon	<i>Daphne mezereum</i>
Midland Hawthorn	<i>Crataegus laevigata</i>
Oregon Grape	<i>Mahonia aquifolium</i>
Osier	<i>Salix viminalis</i>
Portugal laurel	<i>Prunus lusitanica</i>
Privet	<i>Lustrum ovalifolium</i>
Purple Willow	<i>Salix purpurea</i>



Land adjacent to Langstone Technology Park

Preliminary Ecological Appraisal (Update)

Common name	Scientific name
Snowy Mespilus	<i>Amelanchier canadensis</i> , <i>Amelanchier lamarckii</i>
Spindle	<i>Euonymus europaeus</i>
Spurge laurel	<i>Daphne laureola</i>
Sweet briar	<i>Rosa rubiginosa</i>

Table E2 Tree species of native origin or generally thought to be beneficial to wildlife

(Source: 'Gardening with wildlife in mind', Natural England, 2008)

Common name	Scientific name
Pedunculate oak	<i>Quercus robur</i>
Ash	<i>Fraxinus excelsior</i>
Wych elm	<i>Ulmus glabra</i>
Whitebeams	<i>Sorbus aria</i> agg.
Rowan	<i>Sorbus aucuparia</i>
Aspen	<i>Populus tremula</i>
Apple	<i>Malus domestica</i>
Bird cherry	<i>Prunus pardus</i>
Common alder	<i>Alnus glutinosa</i>
Crab apple	<i>Malus sylvestris</i>
Crack willow	<i>Salix fragilis</i>
Downy birch	<i>Betula pubescens</i>
Field Maple	<i>Acer campestre</i>
Hornbeam	<i>Carpinus betulus</i>
Juniper	<i>Juniperus communis</i>
Large-leaved lime	<i>Tilia platyphyllos</i>
Small-leaved lime	<i>Tilia cordata</i>
Pear	<i>Pyrus communis</i>
Scots Pine	<i>Pinus sylvestris</i>
Sessile oak	<i>Quercus petraea</i>
Silver birch	<i>Betula pendula</i>
Sweet chestnut	<i>Castanea sativa</i>
Wild Cherry	<i>Prunus avium</i>
Wild service-tree	<i>Sorbus torminalis</i>
Yew	<i>Taxus baccata</i>



Land adjacent to Langstone Technology Park

Preliminary Ecological Appraisal (Update)

Table E3 Gardening for bats

Aim at having flowers in bloom throughout the year, including both annuals and herbaceous perennials.

Below are some suggestions, though this is not an exhaustive list. Flowering times are approximate, varying dependent on region. Regular dead-heading extends flowering period in many flowers.

A=annual, HA= hardy, annual, HHA=half-hardy annual, P=perennial, W=wild flower.

Flowers for borders			
St. John's Wort	<i>Hypericum</i>	P	March
Marigolds	<i>Calendula</i>	H/A	March-October
Aubrietia	<i>Aubrietia deltoidea</i>	P	March-June
Honesty	<i>Lunaria rediviva</i>	HB	March
Forget-me-not	<i>Myosotis</i> sp.	A/P	March-May
Elephant ears	<i>Bergenia</i>	P	April
Wallflowers	<i>Erysimum</i>	B	April-June
Cranesbills	<i>Geranium</i> sp.	P	May-September
Yarrow	<i>Achillea millefolium</i>	P	May-
Poppies	<i>Papaver</i> sp.	A	May- July
Dames violet	<i>Hesperis matronalis</i>	P	May-August
Red Valerian	<i>Centranthus ruber</i>	P	May-Sept
Poached egg plant	<i>Limnanthes</i>	HA	June-August
Knapweed	<i>Centaurea nigra</i>	P	June-September
Phacelia		HA	June-September
Ox-eye daisy	<i>Leucanthemum vulgare</i>	P	June-August
Evening primrose	<i>Oenothera biennis</i>	B	June-September
Candytuft	<i>Iberis umbellata</i>	HA	June-September
Sweet William	<i>Dianthus barbatus</i>	B	June-July
Blanket flowers	<i>Gaillardia</i>	P	June -
Verbena	<i>Verbena bonariensis</i>	HHA	June-October
Scabious	<i>Knautia arvensis</i>	P	July-August
Night-scented stock	<i>Mattiola bicornia</i>	HA	July-August
Pincushion flower	<i>Scabious</i> sp.	A/P	July-September
Cherry pie	<i>Heliotrope</i>	HHA	July-October
Mexican aster	<i>Cosmos</i> sp.	A/P	July-October
Cone flower	<i>Rudbeckia</i> sp.	A/P	August-November



Mallow	<i>Lavatera sp.</i>	P	August-October
Michaelmas daisy	<i>Aster sp.</i>	P	August-September
Ice plant 'Pink lady'	<i>Sedum spectabile</i>	P	September
Herbs – both leaves and flowers are fragrant			
Fennel	<i>Foeniculum vulgare</i>		July-September
Bergamont	<i>Monarda didyma</i>		June-September
Sweet Cicely	<i>Myrrhis odorata</i>		April-June
Hyssop	<i>Hyssopus officinalis</i>		July-September
Feverfew	<i>Tanacetum parthenium</i>		June-September
Borage	<i>Borago officinalis</i>		May-September
Rosemary	<i>Rosmarinus officinalis</i>		March-May
Lemon balm	<i>Melissa officinalis</i>		
Coriander	<i>Coprianrum sativum</i>		June-August
Lavenders	<i>Lavendula sp.</i>		
Marjoram	<i>Origanum sp.</i>		
Trees, shrubs and climbers important to insects			
Oak	<i>Quercus sp.</i>		large gardens only
Silver birch	<i>Betula pendula</i>		
Common alder	<i>Alnus glutinosa</i>		Suitable for coppicing
Hazel	<i>Corylus avellana</i>		Suitable for coppicing
Elder	<i>Sambucus nigra</i>		Small
Goat willow	<i>Salix caprea</i>		Suitable for coppicing
Hawthorn	<i>Crataegus monogyna</i>		Suitable for coppicing
Honeysuckle	<i>Lonicera sp.</i>		Grow a variety for succession
Dog rose	<i>Rosa canina</i>		Climber
Bramble	<i>Rubus fruticosus</i>		Climber
Ivy	<i>Hedera helix</i>		Climber
Buddleia	<i>Buddleia davidii</i>		Shrub
Guelder rose	<i>Viburnum opulus</i>		Shrub
Gorse	<i>Ulex sp.</i>		Shrub
Plants for pond edges and marshy areas			
Purple loosestrife	<i>Lythrum salicaria</i>	W	June-August
Meadow sweet	<i>Filipendula ulmaria</i>	W	June-September
Lady's smock	<i>Cardamine pratensis</i>	W	April-June
Water mint	<i>Mentha aquatica</i>	W	July-September
Angelica	<i>Angelica sylvestris</i>	W	July-September



Land adjacent to Langstone Technology Park

Preliminary Ecological Appraisal (Update)

Hemp agrimony	<i>Eupatorium cannabinum</i>	W	March-May
Marsh marigold	<i>Caltha palustris</i>	W	June-September
Creeping Jenny	<i>Lysimachia nummularium</i>	W	May-August
Fringed water lily	<i>Nymphoides peltata</i>	W	June-September
Water forget-me-not	<i>Myosotis scorpioides</i>	W	June-September

Allow part lawns to grow long in summer and cut in autumn, removing the clippings. Avoid using fertilisers. Compost heaps are food producers for insects too.

(Source: 'Gardening for bats', Bat Conservation Trust, 2004)