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Begbroke Science Park

Outline Planning Application

Ecology Report

For University of Oxford

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Client	University of Oxford
Project	Begbroke Science Park - Outline Planning Application: Ecology Report
Version	FINAL
Project number	P17-488 BegbrokeSciParkPlanningApp_EcoStatement

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Reviewed	Peter Shepherd	Partner	22 March 2018
Approved for issue to client	Peter Shepherd	Partner	22 March 2018
Issued to client	Tom Flynn	Senior Ecologist	23 March 2018
Revised	Tom Flynn	Senior Ecologist	04 April 2018
Issued to client	Tom Flynn	Senior Ecologist	04 April 2018
Revised	Tom Flynn	Senior Ecologist	04 May 2018
Issued to client	Tom Flynn	Senior Ecologist	04 May 2018

Contents

1 Summary

1.1 BSG Ecology was commissioned by the Chancellor, Masters and Scholars of the University of Oxford (the "University of Oxford") in January 2018 to undertake a site survey and produce an Ecology Report in relation to an application for outline planning permission for the development of residual areas of Begbroke Science Park, Begbroke. The application would cover new buildings and car parking in three parts of the Science Park. Together these three zones fall within the existing, established red lined planning boundary of the Science Park (the "Site") and cover an area of circa. 1.21 ha.

1.2 This Ecology Report aims to evaluate potential ecological impacts of the proposed development, based on a desk study and on recent surveys at and around the Science Park. Consultation regarding the scope of this Report was carried out with Cherwell District Council, as local planning authority. All areas of the Site were walked over on 23 January 2018 by Dr Tom Flynn, Senior Ecologist at BSG Ecology and a botanical specialist, and Helen Simmons, Ecologist at BSG Ecology and holder of Level 3 and 4 Natural England Bat licences. The Site was re-visited on 15 March 2018 by Dr Tom Flynn to assess all trees at the Site for their potential to support roosting bats.

1.3 There are no designated wildlife sites within or adjacent to the Site. The closest designated wildlife site is Rushy Meadows Site of Special Scientific Interest, located 0.37 km to the north-east beyond arable land. The Lower Cherwell Valley Conservation Target Area is located 0.26 km to the north-east the Site, beyond arable land.

1.4 Habitats at the site include hedgerow, trees, semi-improved neutral grassland, amenity grassland and hardstanding. There is recent environmental DNA evidence of great crested newt in a pond in the southern part of the Science Park, located outside the site of the proposed development. There is limited potential for the Site to support reptiles and invertebrates and it is unlikely to be of value to any other protected or otherwise notable species.

1.5 Potential significant adverse effects of the proposed development include the loss of hedgerow, the loss of trees and degradation of bat habitat in adjacent areas through light spillage. Further adverse effects at the site level, which are not significant include the loss of semi-improved neutral grassland and the loss of bird nesting habitat. There is also potential for breach of wildlife legislation in relation to nesting birds and limited potential for breach of wildlife legislation in relation to great crested newt and reptiles.

1.6 Proposed mitigation includes retention/replacement of the existing hedgerow and trees, a precautionary pre-construction badger survey, minimisation of light spill, input to the lighting scheme by an ecologist, measures to avoid impacts on nesting birds, incorporation of birds and bat boxes into new buildings, precautionary measures to avoid impacts on reptiles and great crested newt (subject to the completion of surveys currently underway, expected end of May 2018), provision of new invertebrate habitat, and enhancement of grassland habitat elsewhere within the Science Park.

1.7 In order to verify that the development will create a net gain in habitat biodiversity, a biodiversity impact assessment calculation was carried out using the Warwickshire Coventry and Solihull Biodiversity Calculator. The proposed development will lead to a Habitat Biodiversity Impact Score of 0.28, i.e. a gain in habitat biodiversity.

1.8 The proposed development will likely cause a loss of some mature and semi-mature trees (see accompanying Arboricultural Report by FPCR), but if the mitigation and enhancements specified in this report are implemented in full there will be no breaches of wildlife legislation or significant ecological impacts. The proposed development is likely to produce a net gain in biodiversity, in terms of both habitats and species. This is in line with the National Planning Policy Framework.

1.9 It is recommended that the mitigation outlined in Table 6 is specified in detail in a Construction Environmental Management Plan (CEMP), to be followed by the applicant and any contractor(s). It is recommended that the submission and approval of this document by Cherwell District Council is subject to a suitably-worded planning condition on any permission.

1.10 It is recommended that the submission and approval of the lighting strategy (including a lux level contour plan) by Cherwell District Council is also subject to a planning condition on any permission.

2 Introduction

Background to commission

2.1 BSG Ecology was commissioned by the University of Oxford in January 2018 to undertake a site survey and produce an Ecology Report in relation to an application for outline planning permission for the development of residual areas of Begbroke Science Park.

Site description

2.2 Begbroke Science Park is managed by the University of Oxford for academic research and space for new high-tech start-up companies. Over the last decade the Science Park has grown to the extent that it is now home to over 30 commercial companies and 20 research groups from several University departments.

2.3 It is located off the A44 Woodstock Road, approximately 5 miles north of Oxford city centre. Close to the village of Begbroke, the red lined site of the main Science Park itself occupies approximately 4.8 hectares (excluding access). The building architecture comprises a mixture of large, modern office buildings; complemented by traditional buildings of historic value, such as the Jacobean farmhouse in the southern part of the Science Park. Landscaped gardens, including a walled garden, extensive lawns and a perimeter tree screen planted in 2001 along with associated grassland provide considerable green space within the confines of the Park. Soils in the area of the Science Park are deep loamy soils and loamy soils over gravel (LRA, 2017).

Description of project

2.4 The University of Oxford is submitting an application for outline planning permission to develop residual areas of the Science Park which have not yet been built out. This is to “renew” a previous outline planning permission for similar development granted in 2015, which is time-expired. Specifically, the application would cover new buildings and car parking in three parts of the Science Park, as indicated in the Framework Plan included in Appendix 1 (i.e. new buildings in Zone B and Zone C and new parking in Zone D). Together these three zones (the “Site”) cover an area of circa. 1.21 ha.

Aims of this study

2.5 This Ecology Report aims to evaluate the potential ecological impacts of the proposed development (and to propose appropriate ecology mitigation measures) based on the following:

- A review of recent ecological surveys at and around the Science Park.
- A review of updated ecological desk study data from the vicinity of the Site from the Thames Valley Environmental Records Centre.
- A walkover survey of the site by a professional ecologist.
- Consideration of the location, nature and extent of the proposed development in relation to any ecological features within or near the Site.

3 Methods

Consultation

3.1 The scope of this Ecology Report was supplied to Charlotte Watkins, Ecology Officer at Cherwell District Council via email on 9 March 2018 for comment. The relevant correspondence is attached at Appendix 2.

Desk study

3.2 The desk study involved searching for Natura 2000 designated wildlife sites within 5 km of the site and other statutory wildlife sites within 2 km of the Site using the Government's MAGIC[1] website, and searching for all ponds within 0.5 km of the Site using the Ordnance Survey mapping data available on the MAGIC website.

3.3 It also involved reviewing data obtained on 20 December 2017 from the Thames Valley Environmental Records Centre (TVERC) for all records of non-statutory designated wildlife sites and protected or otherwise notable species within 2 km of the Site.

3.4 The following documents were also reviewed for any relevant information:

- BSG Ecology (2014) *University of Oxford, Begbroke: Biodiversity Implementation Plan.* Report to Oxford University.
- BSG Ecology (2015a) *Land around Begbroke Science Park: Biodiversity Survey*. Report to Oxford University.
- BSG Ecology (2015b) *Land around Begbroke Science Park: Badger Survey (confidential Report).* Report to Oxford University.
- BSG Ecology (2015c) *Begbroke: Grassland Monitoring Survey 2015. Report to Oxford University.*
- BSG Ecology (2015d) *Begbroke Science Park Accelerator Project: Ecological Appraisal Report.* Report to Oxford University. (No 98129).

3.5 A summary of relevant legislation and national planning policy is provided in Appendix 3.

Field survey

3.6 All areas of the Site were walked over on 23 January 2018 by Dr Tom Flynn, Senior Ecologist at BSG Ecology and a botanical specialist, and Helen Simmons, Ecologist at BSG Ecology and holder of Level 3 and 4 Natural England Bat licences (numbers 2015-10061-CLS-CLS and 2015-10063-CLS-CLS). Dr Flynn produced this Report.

3.7 Habitats present at the Science Park were noted by the surveyor, using the habitat categories in JNCC (2010). The potential for the site to support protected species was assessed. This included a preliminary appraisal of the potential of buildings throughout the Science Park to support roosting bats, based on the guidance provided under *Preliminary ground level roost assessment – structures* in Chapter 5 of Collins (2016), and an assessment of the suitability of the pond present within the Science Park to provide habitat for great crested newt *Triturus cristatus*, in line with the guidance in ARG (2010).

3.8 The Site was re-visited on 15 March 2018 by Tom Flynn to assess all trees at the Site for their potential to support roosting bats, based on the guidance provided under *Preliminary ground level roost assessment – trees* in Chapter 6 Collins (2016).

[1] www.magic.gov.uk

3.9 A previous Phase 1 habitat survey of the Science Park was carried out by Tom Flynn in January 2015, and botanical monitoring of selected areas of grassland at the Science Park was carried out in 2014 and 2015 by Dr Jim Fairclough, Principal Ecologist at BSG Ecology and Tom Flynn respectively.

Limitations to methods

3.10 The field survey was carried out outside the optimal period for Phase 1 habitat surveys according to the guidance provided by JNCC (2010). However, the site has been visited a number of times by the surveyor for the purpose of carrying out various ecological surveys, including detailed botanical survey. Because of this previous work, and the limited suite of habitats present at the Site, the timing of the most recent field survey is not considered to limit the comprehensiveness and/or effectiveness of this biodiversity survey and assessment.

4 Ecological Baseline

Designated Wildlife Sites

4.1 There are no designated wildlife sites within the Site itself. Natura 2000 designated wildlife sites within 5 km and all other designated wildlife sites within 2 km of the Site are listed in Table 1.

Table 1: Designated Wildlife Sites.

Designation	Site Name/Number	Description	Approx. Distance & Direction from Site
Special Area of Conservation (SAC)	Oxford Meadows	A series of meadows in the River Thames floodplain to the west and north-west of Oxford, including hay meadows and pasture, supporting the Annex I habitat Lowland Hay Meadows (*Alopecurus pratensis*, *Sanguisorba officinalis*) and the Annex II species creeping marshwort *Apium repens*.	2.67 km S
Site of Special Scientific Interest (SSSI)	Rushy Meadows	A series of unimproved alluvial grasslands alongside the Oxford Canal supporting rich meadow and fen communities containing several uncommon plant species.	0.37 km NE
Local Wildlife Site (LWS)	Bladon Heath 41L02	A former heath that has been planted with conifers but retains some of its distinctive plant and invertebrate species, and has areas of semi-natural woodland, and fragments of slightly acid open ground along its rides.	1.5 km W
	Begbroke Wood 41 R03	Oak woodland with abundant bluebells, silver-washed fritillary butterfly, damp areas and an area of calcareous grassland.	0.96 km W
	Langford Meadow 41S02	An area of tall herb fen, lowland meadow and rough grassland, supporting a range of plant species, and a locally important site for birds including reed bunting and snipe.	1.32 km N
	Meadows West of Oxford Canal 41V18	Two fields with ridge and furrow, supporting lowland meadow and fen habitats and with species-rich hedgerows.	1.7 km SE
Conservation Target Area (CTA)	Lower Cherwell Valley	The Cherwell Valley from Lower Heyford to Kidlington and south of Kidlington along the Oxford Canal. Dominated by lowland meadows but with other habitats including wetlands and quarry workings.	0.26 km NE
Woodland Trust Reserve	Stratfield Brake	A small area of mature woodland and larger areas of young planted woodland. Two large ponds are present.	1.66 m SE

Habitats

4.2 Habitats at the Site are listed in Table 2 and shown on Figure 1. Habitat categories follow JNCC (2010).

Table 2: Habitats present within the Site.

Habitat	Description
Hedgerow	A 65 m length of formal beech *Fagus sylvatica* hedgerow is present on a small part of the boundary of Area B. Since it comprises more than 80% native species (i.e. beech) this hedgerow qualifies as a Habitat of Principal Importance in England, based on the UK Biodiversity Action Plan Priority Habitat definitions in BRIG (2011).
Trees	A semi-mature laburnum *Laburnum anagyroides* is present on the western boundary of Zone B. Several semi-mature trees (Scot's pine *Pinus sylvestris*, apple *Malus pumila* and hawthorn *Crataegus* species) are present in Zone C. Two semi-mature trees (*Acer* species) are present in Zone D.
Semi-improved neutral grassland	An area of circa. 0.15 ha of good semi-improved neutral grassland is present within Zone B. This grassland has an open sward with areas of bare ground visible, indicating that it is of relatively recent origin. It is present on a flat area with a sandy soil. Online aerial imagery shows that a row of two to three residential buildings (and associated gardens) were present in this area until at least 2004. A list of plant species present in this area was collected by BSG Ecology surveyors during grassland monitoring surveys carried out in 2014 and 2015. This list is provided in Appendix 4. From the species present and the recent origin of this grassland, it does not have affinity to National Vegetation Classification communities MG4, MG5 or MG8. It therefore does not represent the Habitat of Principal Importance Lowland Meadows, based on the description in BRIG (2011). Because of its recent origin, open sward, sandy soils and the suite of species present, the grassland has some similarity with the Habitat of Principal Importance *Open Mosaic Habitats of Previously Developed Land*. However, the criteria for this habitat type in BRIG (2011) are not met (due to its small size, lack of loose bare substrate, and lack of spatial variation). This habitat is therefore not a Habitat of Principal Importance in England.
Amenity grassland	Amenity grassland is present in Zones C and D. This is dominated mainly by perennial rye-grass *Lolium perenne* or by red fescue *Festuca rubra*. Other species present include dandelion *Taraxacum* agg. and yarrow *Achillea millefolium*.
Hardstanding	Around half of Zone C, and the majority of Zones B and D support hardstanding or compacted gravel used for parking.

Species

4.3 Potential for protected or otherwise notable species at the Site is described in Table 3. This incorporates relevant information on protected or notable species received from TVERC. No other potential for protected species was noted at the Site.

Table 3: Potential for protected species at the Site.

Species	Description
Badger	From previous survey work (specifically BSG Ecology (2015b) and work carried out by BSG in January 2018 but not yet reported), badger is known to be present in the local area. No signs of badgers or badger setts were found on or within 30 metres of the Site on any of the surveys carried out by BSG

	Ecology, including the survey carried out in January 2018.
Roosting Bats	There is no suitable roosting habitat for bats at the Site (i.e. the trees that are present have no potential roost features, and no buildings are present). Beyond the Site, buildings with potential to support roosting bats are present in the south-western part of the Science Park, as indicated on Figure 1. These include a prefabricated concrete building (B1) and a complex of brick and stone buildings (B2), together considered to have low potential to support roosting bats, a Jacobean farmhouse and an associated complex of stone buildings (B3) considered to have high potential, and a stone building with moderate potential. Zone B is located at least 83 m from all buildings with bat potential and is shielded from all of these by tall buildings. The closest buildings to Zone C that have bat potential are buildings with low potential, 28 m to the south and 48 m to the south-east. Buildings with high potential are at least 85 m away and shielded by other buildings. The closest building to Zone D that have bat potential is the Farmhouse, which has high potential, located 35 m to the west and partially shielded by mature trees.
Foraging Bats	Due to the limited vegetation present and small overall area, the Site offers limited opportunities for foraging bats. Mature trees and the pond in the south of the Science Park, and a 5 m wide screen of young trees surrounding the Science Park offer suitable foraging areas for a range of bat species.
Commuting Bats	Due to the limited vegetation present, the Site offers limited opportunities for commuting bats. The mature trees in the wider Science Park and the surrounding belt of young trees may provide connectivity for bats between the Rowel Brook corridor to the north and the Sandy Lane green corridor to the south.
Nesting birds	The hedgerow and trees at the Site are likely to support nesting birds.
Reptiles	The semi-improved neutral grassland within Zone B provides some potential habitat for common reptile species such as slow-worm *Anguis fragilis* and common lizard *Zootoca vivipara*, though due to the limited structure and lack of scrub cover, this habitat is sub-optimal. If present, the number of reptiles at the site is likely to be low.
Great crested newt	The only records of great crested newt *Triturus cristatus* in the desk study were from a pond in north-east Kidlington, located 1.5 km from the site beyond Kidlington. No ponds are present within the Site. A formal pond is present in the south of the Science Park, approximately 4 m × 10 m in extent. This is stocked within ornamental fish. The HSI score of 0.19 calculated for this pond in the 2015 report indicates that it is likely to be poor breeding habitat for great crested newt. However, the results of an environmental DNA survey carried out by BSG Ecology in April 2018 indicate that this species is present in this pond. This survey is yet to be formally reported due to continuing further surveys for this species, which will be completed end of May 2018 and reported as soon as possible thereafter (i.e. within the 13-week determination period for the application). This pond is located at the following approximate distances from the Site (using the shortest feasible route an amphibian could take): Zone B: 200 m; Zone C: 125 m; Zone D: 85 m. Habitats in Zone C and D are limited to hardstanding and amenity grassland which are poor habitat for great crested newt. There is a small area of semi-improved neutral grassland within Zone B, but this is 200 m from the pond across hardstanding and around buildings. The pond and the Site are not close to (i.e. within 250 m of) any other ponds.

Invertebrates	Due to the open sward and the presence of some bare ground and sandy soil, the 0.15 ha of semi-improved neutral grassland at the Site may support a thermophilic invertebrate community typical of brownfield environments.

5 Evaluation of Ecological Features

5.1 Table 4 provides a geographic evaluation of the ecological features (designated sites, habitats and species) associated with the Site, as identified in the previous section.

5.2 Table 4: Evaluation of ecological features.

Feature	**Geographic level of Importance**	**Justification**
Oxford Meadows SAC	International: European	Internationally designated site.
Rushy Meadows SSSI	National: UK	Nationally designated site.
Other designated sites	District: Cherwell District	Designated at the regional level (i.e. Thames Valley). Local Plan Policy ESD10 requires losses of sites, habitats or species of local importance to be mitigated to achieve a net gain in biodiversity.
Hedgerow	Local	A Habitat of Principal Importance in England. Local Plan Policy ESD10 requires losses of sites, habitats of principal importance to be mitigated to achieve a net gain in biodiversity. A short length (65 m) of species-poor hedgerow is present at the Site.
Trees	Local	Local Plan Policy ESD10 states that the protection of trees will be encouraged. Only semi-mature trees are present at the Site.
Semi-improved neutral grassland	Site	Noted as a habitat of medium distinctiveness in the Warwickshire, Coventry and Solihull Biodiversity Impact Assessment Calculator, as required to be employed in this planning application by Cherwell District Council. Because of the small extent present and its recent origin, this is considered to be of value at the site level only.
Amenity grassland	Low ecological value	A common and widespread habitat, noted as a habitat of low distinctiveness in the Warwickshire, Coventry and Solihull Biodiversity Impact Assessment Calculator.
Hardstanding	Low ecological value	A common and widespread habitat, noted as a habitat of low distinctiveness in the Warwickshire, Coventry and Solihull Biodiversity Impact Assessment Calculator.
Badger	No ecological value	No significant activity at the Site.
Bats (within Site)	Low ecological value	No roosting potential and poor foraging or commuting habitat.
Bats (within wider Science Park)	Up to National: UK	Bats are protected under UK and European legislation. Buildings in the south of the Science Park have potential to provide multiple bat roosts, and mature trees and surrounding tree belts at the Science Park have potential to provide locally important habitat connectivity.

Nesting birds	Up to Local	Nesting birds are protected under UK legislation. The trees and hedgerow at the site have the potential to support common and widespread species of garden birds, including the Species of Principal Importance species dunnock and house sparrow. However, since the Site is dominated by hardstanding and amenity grassland, the site is generally of limited value for nesting birds.
Reptiles	Up to Local (pending survey results)	Common reptile species are protected under UK legislation. The habitats at the site are sub-optimal and limited in extent. The site does not provide important habitat connectivity.
Great crested newt	Up to Local (pending survey results)	This species is protected under UK and European legislation. There is one pond likely to support great crested newt in the vicinity of the Site. The habitats within the Site are generally hardstanding and amenity grassland which offer poor habitat for this species. A small area of semi-improved neutral grassland, which provides more suitable habitat for this species is present in Zone B, but this is located a minimum of 200 m from the pond using the shortest feasible route an amphibian could take, beyond buildings and hardstanding. This species is therefore considered unlikely to be present at the Site.
Invertebrates	Site	The site provides some habitat likely to support a range of invertebrate species, but this is of limited extent, and below Habitat of Principal Importance grade.

6 Potential Ecological Impacts

Impacts of the development alone

6.1 Table 5 characterises potential ecological impacts and effects of the proposed development on the ecological features associated with the Site. Features determined to be of low ecological value in Table 4 are excluded from Table 5 and further analysis.

Table 5: Evaluation of ecological features.

Feature	Potential Impacts	Assessment of Ecological Effects	Significance
Oxford Meadows SAC	Aerial pollution	Due to a lack of significant emissions from the proposed development, and the distance between the SAC and the Site (2.67 km), no ecologically significant effect is anticipated.	No significant effect
	Increased recreational pressure	Due to limited public access to or use of parts of the SAC within 5 km of the Site, and the absence of a residential component to the proposed development, no increase in recreational pressure (and therefore no ecologically significant effect) on the SAC is anticipated.	
	Changes to hydrological regime	Due to the distance between the SAC and the Site (2.67 km), no ecologically significant effect is anticipated.	
Rushy Meadows SSSI	Aerial pollution	Due to a lack of significant emissions from the proposed development, and the distance between the SSSI and the Site (0.37 km), no ecologically significant effect is anticipated.	No significant effect
	Increased recreational pressure	Due to the lack of public access to the SSSI, and the absence of a residential component to the proposed development, no increase in recreational pressure (and therefore no ecologically significant effect) is anticipated.	
	Changes to hydrological regime	The majority of the Site currently supports hardstanding. This and the Site's limited extent meant this it is unlikely to provide a locally important level of rainwater infiltration. A recent hydrological and hydrogeological desk study (WYG, 2018) concluded that extensive development on land surrounding the Science Park had negligible risk of adversely affecting the SSSI. Therefore no ecologically significant effect on the SSSI is anticipated.	
Other designated sites	Aerial pollution	Due to the distance between these sites and the Site (0.26 km to 1.7 km), no ecologically significant effect is anticipated.	No significant effect
	Increased recreational pressure	Due to the distance between publicly accessible parts of these sites and the Site and the absence of a residential component to the proposed development, no increase in recreational pressure (and therefore no ecologically significant effect) is anticipated.	

	Changes to hydrological regime	Due to the distance between these sites and the Site (0.26 km to 1.7 km) and the limited extent of the Site, no ecologically significant effect is anticipated.	
Hedgerow	Damage or destruction during construction	Development at the site could potentially result in the loss of 65 m of species-poor hedgerow that is a Habitat of Principal Importance. Due to the limited extent and its species-poor status, this effect is considered significant at the local level only.	Significant adverse effect at the local level.
Trees	Damage or destruction during construction	Development at the site could potentially result in the loss of several semi-mature trees.	Significant adverse effect at the local level.
Semi-improved neutral grassland	Damage or destruction during construction	Development at the site could potentially result in the loss of 0.15 ha of this habitat.	Adverse effect at the site level. Not significant.
Badger	Killing, injury or disturbance or damage to setts during construction work.	Since there are no badger setts within 30 m of the site, and no signs of badger have been seen at the site, impacts are considered unlikely. However, precautionary measures are recommended to further minimise the risk of breaching wildlife legislation.	No significant effect.
Bats	Lighting from new internal or external sources.	Disturbance to roosting bats and degradation of bat roosts from new lighting is possible, depending upon the details of the lighting scheme. However, given the distance between the Site and potential bat roosts, the shielding of roosts likely to be provided by existing buildings, and the shielding of potential commuting routes likely to be provided by surrounding tree belts, any effect is likely to be limited to the local level.	Significant adverse effect at the local level.
		Degradation of bat commuting routes is possible, depending upon the details of the lighting scheme. Given the shielding of potential commuting routes likely to be provided by surrounding tree belts, any effect is likely to be limited to the local level.	
Nesting birds	Loss of habitat during construction	Since the Site is dominated by hardstanding and amenity grassland, the Site is of limited value for nesting birds. However, the trees and hedgerow have the potential to support common and widespread species, including the Species of Principal Importance dunnock and house sparrow. The removal of this vegetation will reduce the local availability of nesting and foraging habitat.	Adverse effect at the Site level. Not significant.
	Killing or injury of individual bird, or damage or destruction of nests	The removal of hedgerows and trees at the Site has the potential to kill and injure individual birds (and damage or destroy nests).	No significant effect. Limited potential for breach of wildlife legislation.

Reptiles	Loss of habitat during construction	Since habitat suitable for reptiles at the Site is sub-optimal and limited in extent and the Site does not provide important habitat connectivity, loss of this habitat will not have a significant effect on local populations of these species.	
	Killing or injury of individuals during construction.	Since habitats are sub-optimal and limited in extent, the potential for the killing and injury of reptiles during construction is limited. However, precautionary measures are recommended to further minimise the risk of breaching wildlife legislation.	
Great crested newt	Loss of habitat during construction	Habitat suitable for great crested newt at the Site is limited in extent and poorly connected to the nearest pond, and the nearest pond provides poor breeding habitat. This species is therefore unlikely to be present at the Site and loss of this habitat will not have a significant effect on the local population of this species.	No significant effect. Limited potential for breach of wildlife legislation.
	Killing or injury of individuals during construction	Habitat suitable for great crested newt at the site is limited in extent and poorly connected to the nearest pond, and the nearest pond provides poor breeding habitat. This species is therefore unlikely to be present at the Site, and the potential for killing or injury is limited. However, non-licenced precautionary measures are recommended to further minimise the risk of breaching wildlife legislation.	
Invertebrates	Loss of habitat during construction	Loss of invertebrate assemblage potentially of value at the site level.	No significant effect.

Cumulative Impacts with Local Policy PR8

6.2 The Draft Cherwell Local Plan Partial Review 2011-2031 – Oxford's Unmet Housing Need Policy PR8 seeks to allocate the arable farmland which surrounds Begbroke Science Park for residential and employment use. Potential for cumulative ecological effects has been considered for each of the ecological features listed above. There is considered to be no potential for any significant cumulative effects to occur.

7 Mitigation

7.1 Table 6 outlines appropriate avoidance, mitigation compensation and enhancement measures for the ecological features and effects identified in the previous section.

Table 6. Ecological mitigation.

Feature	Avoidance/Mitigation/Compensation/Enhancement
Designated Sites	None required
Hedgerow	Hedgerow at the Site is to be retained where possible and to continue under current management. If some or all of this hedgerow is to be lost, replant an equivalent or greater length of mixed native hedgerow and manage appropriately by winter trimming every two years thereafter.
Trees	Trees are to be retained at the Site where possible. Where trees are to be lost, replant an equivalent number of native or fruiting species in suitable locations within the Site or the wider Science Park.
Semi-improved neutral grassland	The loss of 0.15 ha of semi-improved neutral grassland at the Site will be more than compensated for by the enhancement of 0.3 ha of poor semi-improved grassland elsewhere in the Science Park, as outlined in the following section, *Biodiversity Calculation*. This grassland enhancement will result in a net gain in habitat biodiversity at the Site.
Badger	As a precautionary measure, because badgers are known to be present in the local area and can construct new setts over relatively short periods of time, a pre-construction badger survey is to be carried out not more than one month prior to the start of construction. In the unlikely event that badger setts are found to be present within 30 m of the Site, a sett closure under licence from Natural England may be required for development to proceed.
Bats	Light spill on areas of vegetation within or outside the Site is to be minimised in the lighting scheme for the development through the specification and use of minimum acceptable lighting levels, and (where appropriate), low-level lighting, directed lighting, shrouds and screens. The lighting scheme is to be subject to input from a professional ecologist, and is to be submitted, along with a lux level contour plan to Cherwell District Council for approval as a condition imposed upon any outline planning permission. A total of ten bat boxes will be integrated into the design of new buildings at the Site, placed at suitable aspects, locations and heights, as advised by a professional ecologist. A suitable product would be the Schwegler 1FR bat tube[2].
Nesting Birds	Impacts on nests will be avoided by avoiding clearance of hedgerow, bushes or trees within the bird breeding season (which is March to August inclusive). Alternatively, clearance may proceed where vegetation has been subject to thorough checks for nesting birds by a professional ecologist, and they has been found to be absent of nesting birds. If present, further monitoring may be required and works in some areas of the site may need to be delayed until any young have fledged. New tree planting (specified under *Trees* above) will provide some compensatory nesting habitat for birds. A total of eight boxes suitable for small species such as a house

[2] https://www.nhbs.com/1fr-schwegler-bat-tube

	sparrow (which is a Species of Principal Importance in England,) will be integrated into the design of new buildings at the Site, placed at suitable aspects, locations and heights, as advised by a professional ecologist. A suitable product would be the Schwegler Brick Nest Box Type 24[3]. A total of five bird boxes suitable for common swift (which is an amber listed species, recently recorded from circa. 1.7 km east of the Site in Kidlington and the target of the Cherwell Swift Conservation Project) will be integrated into the design of new buildings at the Site, placed at suitable aspects, locations and heights, as advised by a professional ecologist. A suitable product would be the Schwegler Brick Nest Box Type 24[4].
Reptiles and Great crested newt	The enhancement of grassland described under Semi-improved neutral grassland above will increase the foraging value of this off-site area for reptiles and amphibians. The following mitigation is to be reviewed subject to results of a reptile survey of the Site and the wider Science Park and a great crested newt survey of the pond scheduled for April–May 2018. Killing or injury of individuals will be avoided by turf stripping being carried out prior to construction under supervision of a professional ecologist and following a precautionary non-licenced method statement. This work will be carried out outside the hibernation period (i.e. outside October to March inclusive). If any reptiles or amphibians are found during this process, these will be moved to a suitable location in the wider Science Park in lidded buckets (newts or small reptiles) or cloth bags (reptiles). In the unlikely event that great crested newts are encountered, it may be necessary to obtain a European Protected Species licence for preparation and construction works to continue. New habitat for reptiles and amphibians will be created within the wider Science Park in the form of two amphibian and reptile habitat mounds in suitable locations. These will be a minimum of 2 m × 1.5m by 1.5 m high, constructed from inert rubble and untreated logs and turfed with turf removed during site preparation works for the development. These habitat mounds are intended to provide suitable shelter, basking and hibernation sites for reptiles and hibernation and shelter sites for great crested newt. Location and construction will be under the advice of a professional ecologist.
Invertebrates	New invertebrate habitat will be provided within the wider Science Park through the creation of two banks of sandy soil in suitable locations exposed to the sun. Each habitat bank will be a minimum of 2 m x 1.5 m by 1 m high. These will be created from sandy soil translocated from the area of semi-improved neutral grassland within Zone B. It is expected that a significant soil seed bank will be translocated with this soil, and no seeding will be necessary. Ongoing management will be limited to strimming of vegetation once per year in August or September.

[3] https://www.nhbs.com/schwegler-brick-nest-boxes
[4] https://www.nhbs.com/schwegler-brick-nest-boxes

8 Biodiversity Calculation

8.1 The biodiversity value of the Site has been determined (as discussed with Cherwell District Council) using the Warwickshire Coventry and Solihull Biodiversity Calculator (WCC, 2018).

Current habitats

8.2 The calculation of the current habitat biodiversity value of the Site is based on the following habitats currently present:

- Hardstanding (in poor condition by default): 0.80 ha.
- Amenity Grassland (in poor condition by default): 0.26 ha.
- Semi-improved grassland (in moderate condition[5]): 0.15 ha.
- Intact hedgerow (in moderate condition[6]): 65 m.
- Total area of Site: 1.21 ha.
- An area of 0.3 ha of poor semi-improved grassland outside the Site (but within the Science Park) will be used for compensatory habitat enhancement (for indicative location, see Figure 1). This area has therefore been included within the calculation of current value.

Habitats after development

8.3 The calculation of the future habitat biodiversity value of the Site after the proposed development assumes the following:

- All of the Site will be converted to building/hardstanding (i.e. this is a worst case scenario): 1.21 ha
- The loss of semi-improved neutral grassland and other habitats at the site will be compensated for by enhancing an area of 0.3 ha of poor semi-improved grassland outside the site but within the Science Park (for potential areas see Figure 1; currently in poor condition[7]) to semi-improved neutral grassland in moderate condition within 5 years. This will be achieved by 1) scarifying to remove the thick thatch layer that is present, 2) harrowing to expose some bare ground, 3) seeding using an appropriate wildflower mixture for neutral loamy soils[8]. Management thereafter will be based on one annual cut in late summer, with removal of arisings.

Net gain in habitat biodiversity

8.4 Based on these assumptions, the Habitat Impact Score (HIS) is 1.72 and Habitat Mitigation Score (HMS) is 2.0. This means the proposed development (including the habitat enhancement specified above) will lead to a Habitat Biodiversity Impact Score of 0.28, i.e. a gain in habitat biodiversity.

[5] Based on criteria 1–4 for lowland meadows on page 65 of Natural England (2010), as specified in WCC (2014). Criteria 1, 2 and 4 are met. Criterion 3 is not met due to the presence of more than 10% bare ground. Therefore, three of the four criteria are met, equating to moderate condition (i.e. 'maintain or restore') as per page 24 of Natural England (2010).
[6] Based on the advice on determining condition under *Hedges: Intact hedge* in (WCC, 2018) which states: "*Using FEP guidance but also taking species-richness into account or providing your reasoning where this is not suitable*". FEP Criteria 1-3 for high environmental value hedges on page 50 of Natural England (2010) are met, suggesting good condition, however, the hedgerow contains only one woody species, and therefore following the guidance in WCC (2018) (i.e. also taking species-richness into account), this has been reduced to moderate.
[7] Poor Semi Improved Grassland has poor condition by default. Species lists for these areas are included in Appendix 3.
[8] A suitable seed mix would be Emoresgate EM5 meadow mixture for loamy soils. Further details of this mixture are available here: https://wildseed.co.uk/mixtures/view/6

9 Conclusion

Residual Effects

9.1 The proposed development will likely cause a loss of mature and semi-mature trees, but if the mitigation and enhancements specified in this Report are implemented in full there will be no significant ecological impacts or breaches of wildlife legislation.

9.2 The proposed development is likely to produce a net gain in biodiversity, in terms of both habitats and species. This is in line with the National Planning Policy Framework.

Ensuring Delivery

9.3 It is recommended that the mitigation outlined in Table 6 is specified in detail in a Construction Environmental Management Plan (CEMP), to be followed by the applicant and any contractor(s). It is recommended that the submission and approval of this document by Cherwell District Council is subject to a suitably-worded planning condition on any planning permission for the proposed development of the Site.

9.4 It is recommended that the submission and approval of the lighting strategy (including a lux level contour plan) by Cherwell District Council is also subject to a planning condition on any permission for the proposed development.

10 References

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11 Figures

Figure 1: Phase 1 habitat plan

LEGEND

- Site boundary
- Broadleaved plantation woodland
- SI — Semi-improved neutral grassland
- SI — Poor semi-improved grassland
- P1 — Open water
- A — Amenity grassland
- Introduced shrub
- Building
- Hardstanding
- Off-site areas of poor semi-improved grassland suitable for enhancement

Buildings potentially suitable for bats

- High
- Medium
- Low
- Species-rich intact hedge
- Stone wall
- Broadleaved tree
- 1 — Target note
- B1 — Building reference

BSG | ecology

OFFICE: Oxford
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JOB REF: 6947.03

PROJECT TITLE
BEGBROKE SCIENCE PARK APPLICATION

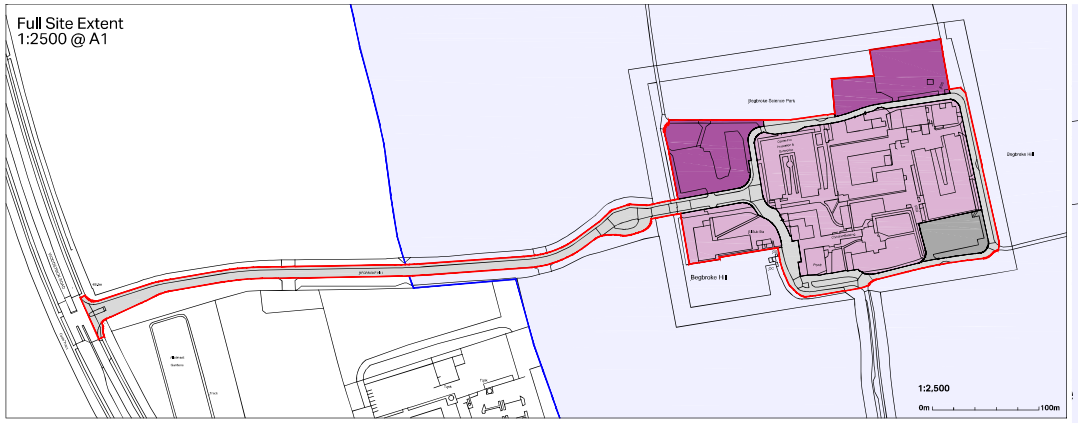
DRAWING TITLE
Figure 1: Phase 1 Habitat Survey Results - Begbroke Science Park

DATE: 06.03.2018 CHECKED: TF SCALE: 1:1,500
DRAWN: COH APPROVED: JF STATUS: FINAL

Sources: BSG Ecology survey data, basemap derived from drawing TDN/033/12/01 produced by University of Oxford Estate Services

C:\Users\melanie\Documents\working\files\roost.bsg-ecology.com\Begbroke\6947.03_phase1_sciencepark.mxd

12 Appendix 1: Framework Plan



Site Area (5.54ha)

Other Land Under the Control of the Applicant

Existing Built Development

Proposed Employment Area

Existing Infrastructure

Proposed Parking

NOTE:
All building heights up to 12.6m above existing ground level (excluding point features and plant)

Park

Zone B
0.47ha

ESS

Zone C
0.52ha

Centre For Innovation & Enterprise

Zone A
2.47ha

B

ESS

Zone A
0.38ha

El Sub Sta

Zone D
0.22ha

Christian Building

GG

GG

Pond

Begbroke Hill

Rev	Description	Date

Client:
University of Oxford

Land at Begbroke

Framework Plan

Scale@A1:	Drawn:	Designed:	Approved:
1:500	ADW	DC	---

0m 20m

Drawing Number:	Revision:	Date:
TRI001/015	A	27.02.18

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David Lock Associates
Town Planning and Urban Design

13 Appendix 2: Correspondence with Cherwell District Council

Thomas Flynn

From: Thomas Flynn
Sent: 09 March 2018 13:58
To: 'Charlotte Watkins'
Cc: 'Rebecca Horley'; Carolyn Puddicombe; Helen Pearson-Flett
Subject: Begbroke Science Park Application: Scope of Ecology Surveys
Attachments: BegbrokeSciParkApplication_EcologyNote.pdf

Dear Charlotte,

In addition to my recent consultation relating to the PR8 application on behalf of the Tripartite, I would also like to consult you in relation to a separate outline planning application that Oxford University will be making shortly to allow them to build out remaining areas of Begbroke Science Park. This is a renewal of a previous similar outline permission that time-expired in May 2017. The proposal in question is now subject of a screening opinion recently registered with CDC (reference 18/00024/SO) and follows pre-application discussions with both Adrian Colwell and Paul Feehily since the start of January 2018, which have been supportive of the principle and parameters of the proposal.

The application would cover new buildings and car parking in three parts of the Science Park, as indicated on the attached plan (i.e. new buildings in Zone B and Zone C and new parking in zone D). These areas currently support mostly hardstanding and amenity grassland, with one area of good semi-improved neutral grassland (of about 0.15 ha, marked on the attached plan, on an area that supported residential dwellings until at least 2004, according to online aerial images). I am writing to consult you about the scope of the ecology surveys and mitigation for this latter application.

BSG Ecology undertook extended Phase 1 habitat surveys of this area in January 2015 and January 2018, and also carried out botanical surveys of grassland at the Science Park (including the good semi-improved neutral grassland) in 2014 and 2015. Given the habitats present, the lack of any change in land management, land use or vegetation structure since 2014/15 (confirmed by the 2018 surveys), the botanical data collected in 2014 and 2015 is considered relevant. Since, on the basis of surveys, there is clearly no potential for grassland that is a Habitat of Principal Importance at the site, an update of the botanical survey is not considered necessary or appropriate.

No existing buildings will be affected by the proposed development, and bat roost potential at the Science Park (which was assessed as part of the Phase 1 habitat survey carried out in January 2018) is limited to the older buildings at the south of the site (including the old farmhouse) which are located away from the proposed new buildings.

There is a formal pond in the south of the Science Park which is stocked with ornamental fish, and is considered to provide poor breeding habitat for great crested newt. Areas to be affected in the development are at some distance from the pond (a minimum of 80m) and are dominated by hardstanding and amenity grassland which are poor terrestrial habitats for this species. The good semi-improved grassland is located 200 m from the pond by the shortest feasible route (which is mainly across hardstanding). Together, these observations suggest that this species is unlikely to be affected by the proposed development, but the ecology report will include precautionary measures to further minimise risk to this species. The pond will be subject to eDNA survey in mid-late April 2018, and if this suggests that this species is absent from the pond, these precautionary measures will be unnecessary. There are no other ponds within 250m of the Science Park.

The good semi-improved grassland is sub-optimal reptile habitat, but this species cannot be ruled out without survey. Precautionary mitigation will be put in place to avoid impacts, and a survey will be conducted in April May 2018. If this suggests that these species are absent from the site, these precautionary measures will be unnecessary.

There is scope to compensate for the loss of the 0.15 ha of good semi-improved grassland within the extensive areas of retained species-poor semi-improved grassland at the science park (within Area A), through habitat

enhancement, and we propose ecological enhancements in the form of grassed log and rubble habitat piles (if amphibians or reptiles are found to be present) in some of these areas along with swift, sparrow and bat boxes on new buildings. We also propose to minimise light spill from new development on to adjacent areas. This can be covered by the imposition of a condition requiring the approval of lighting details prior to occupation of any of the proposed buildings/car parking.

I consider that the habitat and botanical surveys mentioned above provide an appropriate basis for the assessment of the ecological impacts of the proposed development, and are proportionate to the scale and context of the proposed development. I seek your opinion on this matter.

We would also like to know whether CDC would expect to see the use of a Biodiversity Impact Assessment Calculator, for a development of this size and nature, and are agreement with the scale and nature of the propose ecological mitigation.

Many thanks for your assistance in this matter.
Regards
Tom Flynn

Dr Tom Flynn
Senior Ecologist

Worton Park
Worton Oxfordshire OX29 4SX

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14 Appendix 3: Summaries of Relevant Policy, Legislation and Other Instruments

14.1 This section briefly summarises the legislation, policy and related issues that are relevant to the main text of the report. The following text does not constitute legal or planning advice.

National Planning Policy Framework

14.2 The Government published the National Planning Policy Framework (NPPF) on 27th March 2012. Text excerpts from the NPPF are shown where they may be relevant to planning applications and biodiversity including protected sites, habitats and species.

14.3 In conserving and enhancing the natural environment, the NPPF (Paragraph 109) states that 'the planning system should contribute to and enhance the natural and local environment' by:

a. Recognising the wider benefits of ecosystem services;

b. 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;

c. Preventing both new and existing development from contributing to or being put at unacceptable risk from, or being adversely affected by unacceptable levels of soil, air, water or noise pollution or land instability.

14.4 In paragraph 111, the NPPF refers to brownfield land as follows: 'planning policies and decisions should encourage the effective use of land by re-using land that has been previously developed (brownfield land), provided that it is not of high environmental value.'

14.5 Paragraph 117 refers to how planning policies should aim to minimise impacts on biodiversity, to: 'identify and map components of the local ecological networks, including the hierarchy of international, national and locally designated sites of importance for biodiversity, wildlife corridors and stepping stones that connect them and areas identified by local partnerships for habitat restoration or creation;' and to 'promote the preservation, restoration and re-creation of priority habitats, ecological networks and the protection and recovery of priority species populations, linked to national and local targets, and identify suitable indicators for monitoring biodiversity in the plan.'

14.6 Paragraph 118 of the National Planning Policy Framework advises how, when determining planning applications, local planning authorities should aim to conserve and enhance biodiversity by applying the mitigation hierarchy. The mitigation hierarchy advises that 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.

14.7 Where proposals or activities require planning permission, the NPPF states that '…local planning authorities should aim to conserve and enhance biodiversity by applying the following principles:

d. Proposed development on land within or outside a Site of Special Scientific Interest likely to have an adverse effect on a Site of Special Scientific Interest (either individually or in combination with other developments) should not normally be permitted. Where an adverse effect on the site's notified special interest features is likely, an exception should only be made where the benefits of the development, at this site, clearly outweigh both the impacts that it is likely to have on the features of the site that make it of special scientific interest and any broader impacts on the national network of Sites of Special Scientific Interest;

e. Development proposals where the primary objective is to conserve or enhance biodiversity should be permitted;

f. Opportunities to incorporate biodiversity in and around developments should be encouraged;

g. Planning permission should be refused for development resulting in the loss or deterioration of irreplaceable habitats, including ancient woodland and the loss of aged or veteran trees found outside ancient woodland, unless the need for, and benefits of, the development in that location clearly outweigh the loss; and

h. The following wildlife sites should be given the same protection as European sites:

i. potential Special Protection Areas and possible Special Areas of Conservation

ii. listed or proposed Ramsar sites; and

iii. sites identified, or required, as compensatory measures for adverse effects on European sites, potential Special Protection Areas, possible Special Areas of Conservation, and listed or proposed Ramsar sites.'

14.8 In respect of protected sites, the NPPF requires local planning authorities to make 'distinctions…between the hierarchy of international, national and locally designated sites so that protection is commensurate with their status and gives appropriate weight to their importance and the contribution that they make to wider ecological networks.'

14.9 In paragraph 125 the NPPF states that 'by encouraging good design, planning policies and decisions should limit the impact of light pollution from artificial light on local amenity, intrinsically dark landscapes and nature conservation.' This applies to protected species that are a material consideration in the planning process including bats and may also apply to other light sensitive species.

Government Circular ODPM 06/2005 Biodiversity and Geological Conservation

14.10 Paragraph 98 of Government Circular 06/2005 advises 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. Local authorities should consult Natural England before granting planning permission. They should consider attaching appropriate planning conditions or entering into planning obligations under which the developer would take steps to secure the long-term protection of the species. They should also advise developers that they must comply with any statutory species' protection provisions affecting the site concerned..."

14.11 Paragraph 99 of Government Circular 06/2005[9] advises that "it is essential that the presence or otherwise of protected species, and the extent that they may be affected by the proposed development, is established before the planning permission is granted, otherwise all relevant material considerations may not have been addressed in making the decision. The need to ensure ecological surveys are carried out should therefore only be left to coverage under planning conditions in exceptional circumstances, with the result that the surveys are carried out after planning permission has been granted".

Standing Advice (GOV.UK)

14.12 The GOV.UK website provides information regarding protected species and sites in relation to development proposals: 'Local planning authorities should take advice from Natural England or the Environment Agency about planning applications for developments that may affect protected species.' GOV.UK advises that 'some species have standing advice which you can use to help with planning decisions. For others you should contact Natural England or the Environment Agency for an individual response.'

14.13 The standing advice (originally from Natural England and now held and updated on GOV.UK[10]) provides advice to planners on deciding if there is a 'reasonable likelihood' of protected species being present. It also provides advice on survey and mitigation requirements.

[9] *ODPM Circular 06/2005. Government Circular: Biodiversity and Geological Conservation – Statutory Obligations and their Impacts within the Planning System* (2005). HMSO Norwich.

[10] https://www.gov.uk/protected-species-and-sites-how-to-review-planning-proposals#standing-advice-for-protected-species

14.14 When determining an application for development that is covered by standing advice, in accordance with guidance in Government Circular 06/2005, Local planning authorities are required to take the standing advice into account. In paragraph 82 of the aforementioned Circular, it is stated that: 'The standing advice will be a material consideration in the determination of the planning application in the same way as any advice received from a statutory consultee…it is up to the planning authority to decide the weight to be attached to the standing advice, in the same way as it would decide the weight to be attached to a response from a statutory consultee.'

Natural Environment and Rural Communities (NERC) Act 2006 – Habitats and species of principal importance (England)

14.15 The Natural Environment and Rural Communities (NERC) Act came into force on 1st October 2006. Sections 41 and 42 (S41 and S42) of the Act require the Secretary of State to publish a list of habitats and species which are of principal importance for the conservation of biodiversity in England and Wales respectively. The list has been drawn up in consultation with Natural England and Countryside Council for Wales (now NRW), as required by the Act. In accordance with the Act the Secretary of State keeps this list under review and will publish a revised list if necessary, in consultation with Natural England and NRW.

14.16 The S41 and S42 lists are used to guide decision-makers such as public bodies, including local authorities and utilities companies, in implementing their duty under Section 40 of the NERC Act 2006, to have regard to the conservation of biodiversity in England, when carrying out their normal functions, including development control and planning. This is commonly referred to as the 'Biodiversity Duty.'

14.17 Guidance for public authorities on implementing the Biodiversity Duty[11] has been published by Defra. One of the key messages in this document is that 'conserving biodiversity includes restoring and enhancing species populations and habitats, as well as protecting them.' In England the administration of the planning system and licensing schemes are highlighted as having a 'profound influence on biodiversity conservation.' Local authorities are required to take measures to "promote the preservation, restoration and re-creation of priority habitats, ecological networks and the protection and recovery of priority species. The guidance states that 'the duty aims to raise the profile and visibility of biodiversity, clarify existing commitments with regard to biodiversity, and to make it a natural and integral part of policy and decision making.'

14.18 In 2007, the UK Biodiversity Action Plan (BAP) Partnership published an updated list of priority UK species and habitats covering terrestrial, freshwater and marine biodiversity to focus conservation action for rarer species and habitats in the UK. The UK Post-2010 Biodiversity Framework[12], which covers the period from 2011 to 2020, now succeeds the UK BAP. The UK priority list contained 1150 species and 65 habitats requiring special protection and has been used as a reference to draw up the lists of species and habitats of principal importance in England.

14.19 In England, there are 56 habitats of principal importance and 943 species of principal importance on the S41 list. These are all the habitats and species found in England that were identified as requiring action in the UK BAP and which continue to be regarded as conservation priorities in the subsequent UK Post-2010 Biodiversity Framework.

European protected species (Animals)

14.20 The Conservation of Habitats and Species Regulations 2017 consolidates various amendments that have been made to the 2010 and original (1994) Regulations which transposed the EC Habitats Directive on the Conservation of Natural Habitats and of Wild Fauna and Flora (Council Directive 92/43/EEC) into national law.

[11] Defra, 2007. *Guidance for Public Authorities on Implementing The Biodiversity Duty*. (http://www.defra.gov.uk/publications/files/pb12585-pa-guid-english-070516.pdf)
[12] JNCC and Defra (on behalf of the Four Countries' Biodiversity Group). 2012. *UK Post-2010 Biodiversity Framework*. July 2012. (http://jncc.defra.gov.uk/page-6189)

14.21 "European protected species" (EPS) of animal are those which are shown on Schedule 2 of the Conservation of Habitats and Species Regulations 2010 (as amended). They are subject to the provisions of Regulation 43 of those Regulations. All EPS are also protected under the Wildlife and Countryside Act 1981 (as amended). Taken together, these pieces of legislation make it an offence to:

a. Intentionally or deliberately capture, injure or kill any wild animal included amongst these species

b. Possess or control any live or dead specimens or any part of, or anything derived from a these species

c. deliberately disturb wild animals of any such species

d. deliberately take or destroy the eggs of such an animal, or

e. intentionally, deliberately or recklessly damage or destroy a breeding site or resting place of such an animal, or obstruct access to such a place

14.22 For the purposes of paragraph (c), disturbance of animals includes in particular any disturbance which is likely—

a. to impair their ability—

i. to survive, to breed or reproduce, or to rear or nurture their young, or

ii. in the case of animals of a hibernating or migratory species, to hibernate or migrate; or

b. to affect significantly the local distribution or abundance of the species to which they belong.

14.23 Although the law provides strict protection to these species, it also allows this protection to be set aside (derogated) through the issuing of licences. The licences in England are currently determined by Natural England (NE) for development works and by Natural Resources Wales in Wales. In accordance with the requirements of the Regulations (2010), a licence can only be issued where the following requirements are satisfied:

a. The proposal is necessary 'to preserve public health or public safety or other imperative reasons of overriding public interest including those of a social or economic nature and beneficial consequences of primary importance for the environment'

b. 'There is no satisfactory alternative'

c. The proposals 'will not be detrimental to the maintenance of the population of the species concerned at a favourable conservation status in their natural range.

Definition of breeding sites and resting places

14.24 Guidance for all European Protected Species of animal, including bats and great crested newt, regarding the definition of breeding and of breeding and resting places is provided by The European Council (EC) which has prepared specific guidance in respect of the interpretation of various Articles of the EC Habitats Directive.[13] Section II.3.4.b) provides definitions and examples of both breeding and resting places at paragraphs 57 and 59 respectively. This guidance states that 'The provision in Article 12(1)(d) [of the EC Habitats Directive] should therefore be understood as aiming to safeguard the ecological functionality of breeding sites and resting places.' Further the guidance states: 'It thus follows from Article 12(1)(d) that such breeding sites and resting places also need to be protected when they are not being used, but where there is a reasonably high probability that the species concerned will return to these sites and places. If for example a certain cave is used every year by a number of bats for hibernation (because the species has the habit of returning to the same winter roost every year), the functionality of this cave as a hibernating site should be protected in summer as well so that the bats can re-use it in winter. On the other hand, if a certain cave is used only occasionally for breeding or resting purposes, it is very likely that the site does not qualify as a breeding site or resting place.'

[13] Guidance document on the strict protection of animal species of Community interest under the Habitats Directive 92/43/EEC. (February 2007), EC.

Competent authorities

14.25 Under Regulation 7 of the Conservation of Habitats and Species Regulations 2017 (as amended) a "competent authority" includes "any Minister of the Crown…, government department, statutory undertaker, public body of any description or person holding a public office.

14.26 In accordance with Regulation 9, "a competent authority must exercise their functions which are relevant to nature conservation, including marine conservation, so as to secure compliance with the requirements of the [Habitats and Birds] Directives. This means for instance that when considering development proposals a competent authority should consider whether EPS or European Protected Sites are to be affected by those works and, if so, must show that they have given consideration as to whether derogation requirements can be met.

Birds

14.27 All nesting birds are protected under Section 1 of the Wildlife and Countryside Act 1981 (as amended) which makes it an offence to intentionally kill, injure or take any wild bird or take, damage or destroy its nest whilst in use or being built, or take or destroy its eggs. In addition to this, for some rarer species (listed on Schedule 1 of the Act), it is an offence to disturb them whilst they are nest building or at or near a nest with eggs or young, or to disturb the dependent young of such a bird.

14.28 The Conservation of Habitats and Species Regulations 2017 places duties on competent authorities (including Local Authorities and National Park Authorities) in relation to wild bird habitat. These provisions relate back to Articles 1, 2 and 3 of the EC Directive on the conservation of wild birds (2009/147/EC, 'Birds Directive'[14]) (Regulation 10 (3)) requires that the objective is the 'preservation, maintenance and re-establishment of a sufficient diversity and area of habitat for wild birds in the United Kingdom, including by means of the upkeep, management and creation of such habitat, as appropriate, having regard to the requirements of Article 2 of the new Wild Birds Directive…' Regulation 10 (7) states: 'In considering which measures may be appropriate for the purpose of security or contributing to the objective in [Regulation 10 (3)] Paragraph 3, appropriate account must be taken of economic and recreational requirements'.

14.29 In relation to the duties placed on competent authorities under the 2017 Regulations, Regulation 10 (8) states: 'So far as lies within their powers, a competent authority in exercising any function [including in relation to town and country planning] in or in relation to the United Kingdom must use all reasonable endeavours to avoid any pollution or deterioration of habitats of wild birds (except habitats beyond the outer limits of the area to which the new Wild Birds Directive applies).'

Badger

14.30 Badger is protected under the Protection of Badgers Act 1992. It is not permitted to wilfully kill, injure, take, possess or cruelly ill-treat a badger, or to attempt to do so; or to intentionally or recklessly interfere with a sett. Sett interference includes disturbing badgers whilst they are occupying a sett, as well as damaging or destroying a sett or obstructing access to it. A badger sett is defined in the legislation as "a structure or place, which displays signs indicating current use by a badger".

14.31 ODPM Circular 06/2005[15] provides further guidance on statutory obligations towards badger within the planning system. Of particular note is paragraph 124, which states that "The likelihood of disturbing a badger sett, or adversely affecting badgers' foraging territory, or links between them, or significantly increasing the likelihood of road or rail casualties amongst badger populations, are capable of being material considerations in planning decisions."

[14] 2009/147/EC Birds Directive (30 November 2009. European Parliament and the Council of the European Union.
[15] *ODPM Circular 06/2005. Government Circular: Biodiversity and Geological Conservation – Statutory Obligations and their Impacts within the Planning System* (2005). HMSO Norwich.

14.32 Natural England provides Standing Advice[16], which is capable of being a material consideration in planning decisions. Natural England recommends mitigation to avoid impacts on badger setts, which includes maintaining or creating new foraging areas and maintaining or creating access (commuting routes) between setts and foraging/watering areas.

Reptiles

14.33 All native reptile species receive legal protection in Great Britain under Schedule 5 of the Wildlife and Countryside Act 1981 (as amended). Viviparous lizard, slow-worm, grass snake and adder are protected against killing, injuring and unlicensed trade only. Sand lizard and smooth snake receive additional protection as "European Protected species" under the provisions of the Conservation of Habitats and Species Regulations 2017 and are fully protected under the Wildlife and Countryside Act 1981 (as amended).

14.34 All six native species of reptile are included as 'species of principal importance' for the purpose of conserving biodiversity under Section 41 (England) of the NERC Act 2006 and Section 7 of the Environment (Wales) Act 2016.

14.35 Current Natural England Guidelines for Developers[17] states that 'where it is predictable that reptiles are likely to be killed or injured by activities such as site clearance, this could legally constitute intentional killing or injuring.' Further the guidance states: 'Normally prohibited activities may not be illegal if 'the act was the incidental result of a lawful operation and could not reasonably have been avoided'. Natural England 'would expect reasonable avoidance to include measures such as altering development layouts to avoid key areas, as well as capture and exclusion of reptiles.'

14.36 The Natural England Guidelines for Developers state that 'planning must incorporate two aims where reptiles are present:

- To protect reptiles from any harm that might arise during development work;
- To ensure that sufficient quality, quantity and connectivity of habitat is provided to accommodate the reptile population, either on-site or at an alternative site, with no net loss of local reptile conservation status.'

Wild mammals in general

14.37 The Wild Mammals (Protection) Act 1996 (as amended) makes provision for the protection of wild mammals from certain cruel acts, making it an offence for any person to intentionally cause suffering to any wild mammal. In the context of development sites, for example, this may apply to rabbits in their burrows.

[16] http://www.naturalengland.org.uk/ourwork/planningdevelopment/spatialplanning/standingadvice/specieslinks.aspx
[17] English Nature, 2004. *Reptiles: guidelines for developers.* English Nature, Peterborough. http://publications.naturalengland.org.uk/publication/76006?category=31018

15 Appendix 4: Botanical Data

Semi-improved neutral grassland within the Site (source: BSG Ecology, 2015)

15.1 The species list in Table A3-1 is based on one 2 m × 2 m quadrat (number 9) deployed 23 July 2015 and reported in BSG Ecology (2015). This is an area of recently disturbed sandy soil now developing into grassland.

Table A3-1: Species list for semi-improved neutral grassland in north of Science Park.

Common Name	Scientific Name	DAFOR Abundance
Black medick	*Medicago lupulina*	A
Smooth hawk's-beard	*Crepis capillaris*	F
Smooth meadow-grass	*Poa pratensis*	F
Red clover	*Trifolium pratense*	F
Rat's-tail fescue	*Vulpia myuros*	F
Fern grass	*Catapodium rigidum*	O
Bristly ox-tongue	*Helminthotheca echioides*	O
Rough hawkbit	*Leontodon hispidus*	O
Buckthorn plantain	*Plantago coronopus*	O
Ribwort plantain	*Plantago lanceolata*	O
Greater plantain	*Plantago major*	O
Dandelion	*Taraxacum agg.*	O
Hop trefoil	*Trifolium campestre*	O
Scentless mayweed	*Tripleurospermum inodorum*	O
Canadian fleabane	*Conyza canadensis*	R
Weld	*Reseda luteola*	R

Poor semi-improved neutral grassland in north of Science Park

15.2 The species list in Table A3-2 is based on four 2 m × 2 m quadrats (numbers 5, 6, 7 and 8) deployed 23 July 2015 and reported in BSG Ecology (2015). The abundance of highland bent *Agrostis castellana* suggests there has been previous seeding with an agricultural or amenity grass mix.

Table A3-2: Species list for poor semi-improved neutral grassland in north of Science Park.

Common Name	Scientific Name	DAFOR Abundance
Common bent	*Agrostis capillaris*	A
Highland bent	*Agrostis castellana*	F
Red fescue	*Festuca rubra*	F
Yorkshire fog	*Holcus lanatus*	O
Perennial rye-grass	*Lolium perenne*	O
White clover	*Trifolium repens*	O
Creeping bent	*Agrostis stolonifera*	R
Common mouse-ear	*Cerastium fontanum*	R
Field bindweed	*Convolvulus arvensis*	R
Cock's-foot	*Dactylis glomerata*	R
Cut-leaved crane's-bill	*Geranium dissectum*	R
Prickly lettuce	*Lactuca serriola*	R
Common ragwort	*Senecio jacobaea*	R

Poor semi-improved neutral grassland in south-west of Science Park

15.3 The species list in Table A3-2 is based on two 2 m × 2 m quadrats (numbers 1 and 2) deployed 23 July 2015 and reported in BSG Ecology (2015). The abundance of highland bent suggests there has been previous seeding with an agricultural or amenity grass mix.

Table A3-2: Species list for poor semi-improved neutral grassland in south-west of Science Park.

Common Name	Scientific Name	DAFOR Abundance
Red fescue	*Festuca rubra*	A
Highland bent	*Agrostis castellana*	F
Common bent	*Agrostis capillaris*	F
Dandelion	*Taraxacum officinalis*	O
Lesser trefoil	*Trifolium dubium*	O
Common mouse-ear	*Cerastium fontanum*	R
Hawthorn seedling	*Crataegus monogyna*	R
Tall fescue	*Festuca arundinacea*	R
Common ragwort	*Senecio jacobaea*	R
Autumn hawkbit	*Leontodon autumnalis*	R
White clover	*Trifolium repens*	R