Appendix 7.2 Botanical and Protected Species Survey Results

Appendix 7.2: Botanical and Protected Species Survey Results

Great Crested Newt Survey Methodology and Results

Methodology

A7.2.1 Great crested newt (GCN) are a species known to be present in Oxfordshire. Waterbodies are a key habitat for this species which are known to be able to move up to 500m between breeding ponds (English Nature, 2001). An assessment of local Ordnance Survey maps identified a number of waterbodies within this distance from the development site. Given the presence ditches and ponds at the development site, along with terrestrial habitat suitable for GCN (rough grassland) and the presence of a network of suitable ponds within 500m of the development site, in the absence of appropriate mitigation it was assessed that GCN would be adversely impacted by the proposed development.

A7.2.2 Records from Thames Valley Environmental Records Centre returned 21 records of GCN within 2km of the site boundary from the last ten years.

A7.2.3 The distribution of aquatic features within 500m of the development site boundary are shown on plan **11920/P01.**

A7.2.4 The ditches D1, D2 and D3 were assessed as unsuitable for supporting GCN due to being dry/containing little water and lacked suitable vegetation. As a result, no surveys were undertaken for these waterbodies.

A7.2.5 Ponds P1, P2 and P3 were determined to have potential to support GCN, and as a result were subject to survey using eDNA analysis. Water samples were taken from each waterbody on 25th June 2019 by experienced GCN surveyor and Natural England Licence holder Nathan Jenkinson (GCN Class Licence No. 2015-16404-CLS-CLS) using sterile kits provided by Nature Metrics Ltd. The surveys followed standard methodology to prevent contamination of the samples (Biggs et al, 2014). The weather conditions at the time the sample was collected were dry, calm and sunny with an air temperature of 14.5ºC. Samples were returned to Nature Metrics Ltd. for laboratory analysis and returned with a positive or negative result

Results

A7.2.6 The laboratory analysis of the water samples returned a **negative** result for each waterbody. This indicates the **likely absence of GCN**, although it should be noted that a negative result does not preclude the presence of Great Crested Newts at a level below the limits of detection. A full copy of the report from Nature Metrics Ltd. is included below.

Bat Survey Methodology and Results

Methodology

A7.2.7 Bat surveys were conducted following standard methodologies set out in the Bat Mitigation Guidelines (Mitchell-Jones, A.J., 2004), the Bat Workers Manual (Mitchell-Jones, A.J. and McLeish, A.P., 2004) and Bat

Surveys – Good Practice Guidelines (Collins, 2016). These surveys aim to assess the species assemblage present at the development site, identify significant commuting routes and foraging locations, and determine if a bat roost is present in any building or tree identified as having suitable bat roosting potential on the site.

Roost emergence/re-entry surveys

A7.2.8 A Preliminary Bat Roost Assessment was undertaken alongside the extended Phase 1 habitat survey to determine the potential of site buildings and trees to support roosting bats. During this survey Potential Roost Features (PRFs) that may be used by bats, as identified within the BCT Good Practice Guidelines (Collins, 2016), were searched for. The survey followed standard methodologies (Mitchell-Jones, A.J., 2004; Mitchell-Jones, A.J. and McLeish, A.P., 2004; Collins, 2016).

A7.2.9 An external inspection of buildings onsite was conducted. Building B1 (see **Habitat Features Plan 11920_P01**) was assessed as having **low potential** to support roosting bats, with open eaves, lifted roof tiles and missing hip ridge fillet forming the potential roosting features.

A7.2.10 A dawn re-entry survey was undertaken on 18th June 2019 by two ecologists positioned to surround the building. These were Robert Sinclair (Natural England Level 2 Bat Licence 2017-30685-CLS-CLS), and Rebekah Baker. Details of the timings and weather conditions are presented below in **Table A7.2.1**.

Building	Survey	Date	Survey times	Weather conditions (start – end)	Surveyors
B1	Dawn: Re-entry	18/06/2018	Sunrise: 04:44 Start: 02:44 End: 04:59	Wind (Beaufort): 0 Temp (°C): 12 – 10 Precipitation: Dry Cloud (% cover): 100	Robert Sinclair and Rebekah Baker

Table A7.2.1: Weather conditions and timings of building B1 bat roost surveys

A7.2.11 All trees that will be affected by the proposal development were originally assessed as having negligible potential to support roosting bats and no further surveys were recommended.

Bat activity transects and static surveys

A7.2.12 The site was initially assessed as providing **Low Suitability** for foraging and commuting bats, in line with BCT guidance (Collins 2016). As such, three activity transect surveys are required between April – October to cover spring, summer and autumn bat activity at the site. In addition two static bat detectors are deployed over five nights per season to record levels of bat activity over several nights.

A7.2.13 Two ecologists walked transect routes which covered a variety of habitats across the site. They walked at a steady pace to identify concentrations of bat activity and recorded observations. Surveys commenced at sunset and continued for at least two hours.

A7.2.14 An Anabat Express and Batbox Duet detector were used for the first survey; the Duet detector was used for identification in the field and Anabat Express to record zero-crossing data for confirmation of species. 'Analook' (Titley Scientific) bat call analysis software was used to confirm the identification of bat calls.

A7.2.15 For the second survey, a Batbox Duet detector was used for active monitoring with a Zoom recording device for recording in Full Spectrum. 'Pettersson BatSound' analysis software was used to analyse these recordings. Details of the timings and the weather conditions for the activity surveys are shown in **Table A7.2.2**.

A7.2.16 The final survey visit has yet to be undertaken at the time of writing.

Survey	Date	Survey times	Weather conditions (start – end)	Surveyors
Evening Activity 1	20/05/2019	Dusk: 20:59 Start: 20:59 End: 23:00	Wind (Beaufort): 1 Temp (°C): 15 - 13 Precipitation: Dry throughout Cloud cover (%): 0 - 50	Christian Cairns and Rebekah Baker
Evening Activity 2	17/06/2019	Dusk: 21:26 Start: 21:26 End: 23:29	Wind (Beaufort): 2 - 0 Temp (°C): 16 - 14 Precipitation: Dry throughout Cloud cover (%): 20 - 90	Robert Sinclair and Rebekah Baker
Evening Activity 3	Autumn	No data collected yet		

Table A7.2.2: Weather conditions and timings of bat activity surveys

A7.2.17 Two static bat detectors were deployed in areas of habitat with potential interest for bats (one halfway along the western tree-line boundary and one at the eastern end of the hedgerow running west across site) in order to assess the activity of the bat assemblage using the development site.

Limitations

A7.2.18 Bats use a variety of roosts, ranging from maternity, mating, or swarming and hibernation roosts, containing many individuals, to mating or night-feeding roosts containing few individuals or single animals. Bats also tend to be nomadic (although they are faithful to certain favoured roosting sites), spending variable lengths of time in a variety of roosts. Thus, even with considerable survey effort it is possible that small transient roosts of bats may have been missed, although these tend to be of less importance to bats and as such this should not affect the evaluation and recommendations made.

A7.2.19 Bat surveys are subject to numerous variables. The echolocation calls of species such as brown long-eared bats *Plecotus auratus* are of low amplitude and may not always be picked up on bat detectors. Survey results represent a sample of bat activity during the surveys. It is possible that bats may use the development site at other times.

A7.2.20 Bat calls cannot always be identified to species level, either due to distant contacts or the similarity between some types of bat calls. Where this occurs, it is recorded as an 'unidentified bat species' (Unid.), or will show which bat species it is considered likely to be (e.g. *Pipistrelle sp. Or Myotis sp.).*

A7.2.21 The transect route was adapted on the second activity survey to avoid a field with livestock. This resulted in a slight limitation as the middle of the south west field was not surveyed, but this is not considered to be significant in context of the overall survey effort.

Results

A7.2.22 Bat species codes used in data results are given in **Table A7.2.3**.

Pipistrelle	Myotis	Nyctalus	Other
Ppi Common pipistrelle	**My** Myotis species	**Nyc** Nyctalus species	**Ep** Serotine
Ppy Soprano pipistrelle		**Nn** Noctule	**Pa** Brown long-eared bat
NathPip Nathusius' pipistrelle			

Table A7.2.3: Species Code Key

Roost emergence/re-entry surveys

A7.2.23 **Figure A7.2.1** shows the locations of the possible roost (C) and confirmed roosts (D) and (E). The figure should be read in conjunction with **Table A7.2.4** which shows the collated results from both surveyors along with the flight line the bat took. Entries in red indicate a bat returning to a roost (or possible return to a roost).

Time	Species	Flight line	Activity
02:45	Ppi	A	2 x foraging near RS
02:56	Ppy	B	Commuting
02:58	Ppy	B	Commuting
02:59	Ppi	Unseen	Not seen
03:02	Ppi	C	Possible Re-entry into missing brick at roof height
03:04	Ppi	B	Foraging
03:14	Ppi	B	Foraging above house
03:17	Ppy	B	Foraging
03:20	Ppi	A	5 x bats foraging and chasing around roof
03:23	Ppi	D	Possible Re-entry
03:23	Ppy	A	Foraging
03:25	Ppi	B	Foraging till 03:40
03:42	Ppi	B	Not echolocating
03:49	Ppi	B	3 bats foraging
04:00	**Ppi**	**E**	**5 x Re-entries on South side between 04:00 and 04:23**
04:04	**Ppi**	**D**	**Re-entry under ridge roof tile**
04:08	Ppi	B	5 x bats foraging and chasing around roof
04:13	Ppi	B	Foraging

04:16	Ppi	D	Re-entry
04:18	Ppi	D	Re-entry
04:19	Ppi	D	Re-entry
04:19	Ppi	D	3 x Re-entry
04:20	Ppi	D	Re-entry
04:23	Ppi	D	2 x Re-entry

Table A7.2.4 Collated results from dawn Re-entry survey 18th June 2019. Refer to Figure A7.2.1 for indication of flight lines.

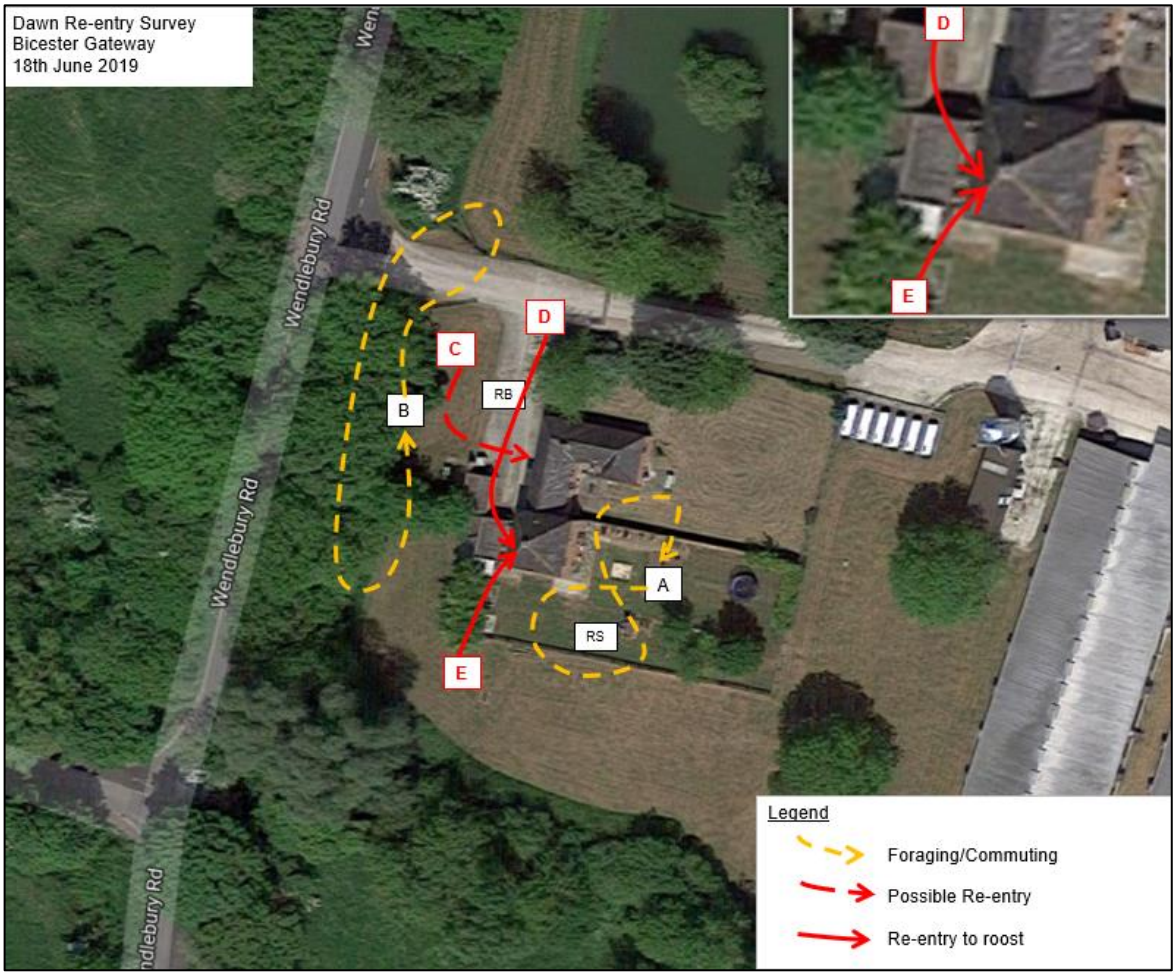

Figure A7.2.1 Results of bat re-entry survey on 18 June 2019

Figure A7.2.2 Bat roost locations

A7.2.24 Between 15 and 17 common pipistrelles were observed re-entering building B1 during the re-entry survey on 18th June 2019. As such, a confirmed bat roost is present in the roof area. Common pipistrelle activity close to a missing brick under the eaves on the west elevation was also observed, however, it was too dark to confirm re-entry of the bat into a roost. Meta data for the surveys can be found below.

Meta data for survey(s)

A7.2.25 Up to 17 common pipistrelles were observed re-entering building B1 during the re-entry survey on 18th June 2019. Survey results are provided below in **Tables A7.2.5** and **A7.2.6**.

Surveyor: Robert Sinclair		
Date: 18/06/19		
Site: 11920 – Bicester Gateway		
Building: B1		
Equipment used: Batbox Duet and Wave		
Sunrise time: 04:44	Start time: 02:40	End time: 04:59
Weather	**At start:**	**At end:**
Cloud cover (%):	10	90
Wind (Beaufort Scale):	1	0
Temperature (°C):	11	9
Precipitation:	Dry throughout	Dry throughout
Notes: **Confirmed re-entry** of five common pipistrelles.		

Table A7.2.5 – Building B1 dawn re-entry survey 18/06/2019

Surveyor: Rebekah Baker		
Date: 18/06/19		
Site: 11920 – Bicester Gateway		
Building: B1		
Equipment used: Batbox Duet and Zoom		
Sunrise time: 04:44	Start time: 02:44	End time: 04:59
Weather	**At start:**	**At end:**
Cloud cover (%):	20	45
Wind (Beaufort Scale):	1	1
Temperature (°C):	12	10
Precipitation:	Dry throughout	Dry throughout
Notes: **Confirmed re-entry** of at least 12-15 common pipistrelles. Almost constant activity throughout survey.		

Table A7.2.6 – Building B1 dawn re-entry survey 18/06/2019

Bat activity transects and static surveys

Activity Transects

A7.2.26 To date, two bat activity surveys have been undertaken at the site. .A summary of the results is shown below in **Tables A7.2.7** and **A7.2.8**.

Visit 1 – May 2019

Date	Pa	Ppi	Ppy	Ep	Grand Total
20/05/2019	2	12	5	3	**22**

Table A7.2.7 Activity transect data – Visit 1

Visit 2 – June 2019

Date	Nn	Ppi	Ppy	Grand Total
17/06/2019	2	4	13	**19**

Table A7.2.8 Activity transect data – Visit 2

A7.2.27 The full findings of the surveys are presented in **Tables A7.2.9** and **A7.2.10** and should be read in conjunction with **Figures A7.2.3** and **A7.2.4**.

Spring Activity Survey Results

Time	Species	Position	Activity
21:34	Ppi	A	Not seen
21:41	Ep	A	Not seen
21:46	Ppy	A	Foraging
21:48	Ppy	A	Not seen
21:53	Ppi	B	Foraging
21:54	Ppi	C	Not seen
21:59	Ppi	D	Foraging
22:09	Ep	B	Foraging
22:10	Ppi	B	Not seen
22:17	Ep	E	Passing
22:19	Ppi	F	Foraging
22:20	Pa	F	Foraging
22:24	Ppi	F	Foraging
22:35	Ppi	F	Foraging
22:39	2 x Ppi	G	Foraging
22:42	Pa	G	Foraging
22:51	Ppy	H	Foraging
22:52	Ppy	I	Not seen
22:58	Ppi	I	Foraging

23:01	Ppy	B	Not seen
23:02	Ppi	B	Foraging
23:05	Ppi	B	Not seen

Table A7.2.9 Results of spring dusk activity survey 20th May 2019

Figure A7.2.3 Results of spring dusk activity survey 20th May 2019.

A7.2.28 Bat activity was concentrated close to field boundaries. Five species of bat were recorded, including common pipistrelle, soprano pipistrelle, serotine, brown long-eared bat and noctule. The highest levels of activity were recorded at the southern boundary where all five species of bat were recorded foraging and commuting. There were low levels of recorded activity in the middle of fields and to the north of the site where there are higher levels of artificial light spill from the neighbouring properties.

Summer Activity Survey Results

Time	Species	Flight line	Activity
21:34	Ppi	A	Not seen
21:50	Ppy	A	Several commuting
21:57	Ppi	B	Commuting
22:01	Ppi	C	Foraging
22:05	Ppy	D	Foraging
22:08	Ppy	D	Commuting

22:09	Nn	D	Foraging
22:15	Ppy	E	Commuting
22:15	Nn	E	Commuting
22:15	Ppy	E	Not seen
22:16	Ppy	E	Not seen
22:20	Ppy	E	Foraging
22:20	Ppy	F	Commuting
22:31	Ppi	G	Foraging
22:44	Ppy	G	Foraging
22:51	Ppy	H	Foraging
22:59	Ppi	I	Foraging
23:17	Ppy	J	Commuting
23:19	Ppy	J	Foraging
23:21	Ppy	G	Foraging

Table A7.2.10 Results of summer dusk activity survey 17th June 2019

Figure A7.2.4 Results of summer dusk activity survey 17th June 2019.

A7.2.29 Fewer bat species were recorded during the summertime visit; Noctule, common pipistrelle and soprano pipistrelle were observed commuting and foraging at the site. The overall levels of bat activity were similar. There was a concentration of soprano pipistrelle activity at (A) close to a large willow *Salix alba*, at between 20 - 27mins after sunset which could indicate the presence of a nearby roost. There were low levels of bat activity at the north of the site.

A7.2.30 The field at the west of the site, north of the chicken sheds, could not be surveyed fully as a bull, and cattle with young calves were present.

Static surveys

A7.2.31 At the time of writing, two out of three static detector surveys have been completed. Results showing the numbers of each species of bat from the completed static detector surveys are given below in **Tables A7.2.11 to A7.2.14**. These should be read in conjunction with **Figure A7.2.5** which shows the locations referred to.

Figure A7.2.5 Static bat detector locations

Date	My	Nyc	Nn	Ppi	Ppy	Ep	Pa	Grand Total
20/05/2019	2	0	40	272	207	18	0	**539**
21/05/2019	2	1	26	6	335	21	1	**392**
22/05/2019	2	0	20	34	110	23	0	**189**
23/05/2019	9	0	24	135	176	11	1	**356**
24/05/2019	24	0	32	76	248	101	0	**481**
Grand Total	**39**	**1**	**142**	**523**	**1076**	**174**	**2**	**1957**

Table A7.2.11 Static detector data – Visit 1, Location 1

Date	My	Nyc	Nn	Ppi	Ppy	Ep	Grand Total
20/05/2019	7	16	21	20	84	4	**152**
21/05/2019	5	4	9	40	105	0	**163**
22/05/2019	4	7	7	8	17	2	**45**
23/05/2019	5	5	7	21	44	0	**82**
24/05/2019	6	7	63	2	21	0	**99**
Grand Total	**27**	**39**	**107**	**91**	**271**	**6**	**541**

Table A7.2.12 Static detector data – Visit 1, Location 2

A7.2.32 During the first deployment of static detectors (20th-24th May 2019), 1957 bats were recorded at Location 1 and 541 were recorded at Location 2.

A7.2.33 Location 1, which is within the western tree line boundary, had moderate of bat activity. Species recorded at this location, in order of highest to least frequent, were: soprano pipistrelle, common pipistrelle, serotine, noctule, *Myotis* spp., brown long-eared bat and *Nyctalus* spp.

A7.2.34 Location 2 also had moderate levels of bat activity, although lower than at Location 1. Species recorded at this location, in order of highest to least frequent, were: common pipistrelle, noctule, soprano pipstrelle, *Nyctalus* spp., *Myotis* spp. and serotine. Brown long-eared bat was not recorded at this location.

Summer static survey results

Date	My	Nn	Ppi	Ppy	Pa	Ep	Grand Total
17/06/2019	4	2	69	13	0	0	**88**
18/06/2019	3	8	39	109	1	1	**161**
19/06/2019	8	4	177	123	0	1	**313**
20/06/2019	5	1	20	91	0	0	**117**
21/06/2019	4	3	56	68	0	1	**132**
Grand Total	**24**	**18**	**361**	**404**	**1**	**3**	**811**

Table A7.2.13 Static detector data – Visit 2, Location 1

Date	My	Nn	Ppi	Ppy	Grand Total
17/06/2019	1	1	6	6	**14**
18/06/2019	4	28	106	153	**291**
19/06/2019	0	3	6	18	**27**
20/06/2019	0	3	1	6	**10**
21/06/2019	2	2	10	16	**30**
Grand Total	**7**	**37**	**129**	**199**	**372**

Table A7.2.14 Static detector data – Visit 2, Location 2

A7.2.35 During the second deployment of static detectors (17th-21st June 2019), 811 bats were recorded at Location 1 and 372 were recorded at Location 2 (see Figure A7.2.5 for locations).

A7.2.36 Location 1 recorded soprano pipistrelle, common pipistrelle, Myotis spp., noctule, serotine and brown long-eared bat (in order of highest to least frequent). The same species were recorded at during both visits, although the assemblage of species differed.

A7.2.37 Location 2 recorded common pipistrelle, soprano pipistrelle, noctule and *Myotis* spp. (in order of highest to least frequent). Fewer species were recorded than on the first visit, and again the number of species was lower than at Location 1. As with the spring survey, Location 2 had lower levels of activity than Location 1.

A7.2.38 Location 1 had lower levels of activity during the second visit than the first visit, while Location 2 had a similar level during both visits.

A7.2.39 The levels of bat activity may be interpreted as bring reasonably high, but relative to the extent, location and nature of the site (in terms of its habitat composition) the overall activity levels and the diversity of bats recorded are comparable to other similar sites in the area.

Limitations

A7.2.40 The final bat activity surveys (both static and walked transects) are due to be undertaken in September/October 2019 in advance of the application being submitted. The results of these surveys are unlikely to change the level of importance assigned to the bat assemblage present on-site or the mitigation proposed for any potential effects. As such, this is not considered to be a significant limitation.

A7.2.41 Reptile Survey Methodology and Results

A7.2.42 Reptile surveys were undertaken across the site to identify the presence or likely absence of reptiles and to determine the size of any population(s) present. These surveys were conducted in-line with Froglife Advice Sheet 10 (Froglife, 1999) and Natural England's standing advice, and were completed within the active season for reptiles (March to October inclusive).

A7.2.43 A total of 60 reptile refugia, comprising 0.5×1m pieces of bitumen roofing felt, were deployed on the 20th March 2019 within areas of suitable habitat identified during the extended Phase 1 habitat survey.

A7.2.44 25 mats were placed along the western boundary of the site, covering semi-improved grassland and bordering hedgerow. A further 15 mats were placed on semi-improved grassland bordering and following the hedgerow running east to west across the middle of the site. The final 20 mats were placed along the hedgerow running north to south across the site, also covering semi-improved grassland and bordering the hedgerow. For a detailed map of reptile mat locations see plan **11920/P02**.

A7.2.45 Refugia were left in situ for seven days to bed in, before seven subsequent survey checks were undertaken between 27th March and 21st May during suitable weather conditions (dry, warm [air temperature between 9ºC to 18ºC], intermittent sun and light winds). The timings and weather data for these surveys are shown below in **Table A7.2.15**

Visit	Start Time	Weather Conditions					
		Temperature (ºC)		Cloud cover (%)		Precipitation	Wind (Beaufort Scale)
		Start	End	Start	End		
V1 27/03/19	10:50	10.5	11	100	100	Dry	0-1
V2 12/04/19	11:50	11	11	80	80	Dry	2
V3 17/04/19	10:15	14.3	14.5	10	5	Dry	1
V4 26/04/19	10:53	12.3	12.7	20	50	Dry	3
V5 30/04/19	10:48	13.1	13.4	20	25	Dry	0-1
V6 17/05/19	09:45	10.5	11	100	80	Dry	3
V7 21/05/19	09:30	12	17	0	0	Dry	1

Table A7.2.15: Meta data for reptile surveys of the site

A7.2.46 In addition to checking beneath the artificial refugia, visual searches of the top of the artificial refugia, and searches of natural refugia/basking spots were also undertaken during each reptile survey visit.

Limitations

A7.2.47 Visit 2 was undertaken outside the recommended survey times by Froglife (1999). However, due to it being only a small amount of time (20 minutes) after the ideal survey window, and weather conditions still being suitable, this is not considered to have a significant impact on the results.

Reptile Survey Results

A7.2.48 During the seven reptile surveys conducted at the site, no reptiles or signs of their presence were found. Full results can be found in Table 7.1.16

A7.2.49 Results of the reptile surveys showed no sign of slow worm, common lizard or grass snake (the three species of reptile most likely to be found) using the site. Survey results for these are summarised below in **Table A7.2.16**

Visit	Species seen		
	Slow worm	Common lizard	Grass snake
V1 27/03/19	0	0	0
V2 12/04/19	0	0	0
V3 17/04/19	0	0	0
V4 26/04/19	0	0	0
V5 30/04/19	0	0	0
V6 17/05/19	0	0	0
V7 21/05/19	0	0	0
Grand Total	**0**	**0**	**0**

Table A7.2.16 – Reptile Survey Results

Botanical Survey Methodology and Results

Introduction

A7.2.50 In order to describe the plant communities present, a floral species list was compiled during an initial walkover of the site followed by a quadrat survey to provide a detailed description of the floral composition of the existing grass sward. Three plots were surveyed on 3 fields which required survey (see **Figure A7.2.6**).

A7.2.51 Quadrat survey methods were based upon those described in Rodwell (1992)[1]. The survey involved an initial walkover to determine an area of visibly structurally homogeneous vegetation. Following this, the species were listed, and the vegetation recorded within five 2m x 2m quadrats. This size of quadrat was used as the sward was relatively dense and gave a reasonable representation of the typical floristic composition across the area surveyed. Floristic abundance was expressed using the Domin scale.

A7.2.52 The survey was undertaken by John Moorcroft (Ecology Associate), a full member Chartered Institute of Ecology and Environmental Management (CIEEM) on the 29th May 2019. The weather conditions on the day of the survey were mostly dry, 15oc with a light breeze and occasional light showers.

Limitations

A7.2.53 The survey was undertaken during late May when some grassland forbs are yet to flower. However, given the fairly limited range of common plant species present, the surveyor was able to identify most species in the vegetative pre-flowering state.

[1] Rodwell, J.S. (Ed.), 1992. British Plant Communities Volume 3: Grasslands and Montane Communities, Cambridge University Press, Cambridge.

Figure A7.2.6 Aerial Image of the site (Google Earth)

Results

A7.2.54 The thee areas comprise the following phase 1 habitat types:

- Plot 1 - 6.3 ha of good semi-improved grassland;
- Plot 2 4.3ha of improved grassland;
- Plot 3 – 4.4ha of improved grassland.

A7.2.55 Plot 1 has the most species diverse sward and broadly conforms to the MG5 *Cynosurus cristatus Centaurea nigra* sub-community, though some of the normally constant species (such as black knapweed *Centaurea nigra* and sweet vernal grass *Anoxanthum odoratum)* were not found in all quadrats. This could be indicative of overgrazing or that the sward has been allowed to become rank in the past.

A7.2.56 Plot 1 would not qualify for selection under wildlife site selection criteria for Berkshire, Buckinghamshire and Oxfordshire[2] for the following reasons:

- It is not likely to support rare species listed in Section 5 of the wildlife section guidelines;
- Whilst MG5 grassland is listed as one of the lowland meadow habitat types for which sites can be selected, it does not support a sufficient number or diversity of indicator species listed in

[2] http://www.tverc.org/cms/sites/tverc/files/LWS%20criteria%20Nov%2009.pdf

table 8 Indicator and typical species of lowland meadows (see Appendix 2);

- The qualifying habitat (MG5) is too small in area (see Appendix 3);
- Does not correspond to 2 or more contextual criteria (see **Appendix 4**).

A7.2.57 Plots 2 and 3 are improved grassland most closely corresponding to MG6 *Lolium perenne - Cynosurus cristatus* grassland. Though in plot 2 perennial ryegrass *Lolium perenne*, co-dominates with soft brome *Bromus hordeaceus,* indicating perhaps that the field has been cultivated with arable crops in the past.

A7.2.58 Neither of the two fields containing plots 1 and 2 would correspond to the calcareous form of MG6 grassland, for which wildlife sites can be selected (or any of the other categories for which they can be selected).

A7.2.59 Full details of the floral composition of the three plots surveyed is provided in Tables A4.1 - A4.3.

Discussion

A7.2.60 The field containing plot 1 is proposed for employment development. Based on the survey results, it is considered that this would not contravene the part of planning policy ESD10 relating to the protection of non-statutory nature conservation designations.

A7.2.61 However, ESD10 also requires the Cherwell and District Council in considering developments for planning consent to seek "*a net gain for biodiversity by protecting mitigating and enhancing existing resources and to incorporate features to encourage biodiversity and where possible, enhance existing features of nature conservation value*". Therefore, some form of mitigation for habitat loss in plot 1 would be expected for compliance with the above planning policy.

A7.2.62 To date proposals for the creation of a wetland / species rich wet grassland mitigation area in the eastern section of the site centred on plot 2 and the eastern section of plot 3 have been made as mitigation for the habitat loss. This seeks to provide a degree of water attenuation for the proposed development whilst creating a series of habitat mosaics which would be contiguous with and provide supporting habitat to those present on the adjacent Bicester Wetland Reserve.

A7.2.63 Whilst the habitats created would not directly reproduce those that would be lost in plot 1, they would if designed correctly include grassland habitat of equal or higher value than that which would be lost. The habitat mosaics that would be created and their proximity to the Bicester Wetland Reserve would strengthen the wetland corridor along the watercourse which feeds the pools on the Reserve, thereby enhancing an important wildlife corridor. In combination this will provide sufficient mitigation for planning policy compliance with ESD10.

Appendix 1: Indicator Species for Lowland Meadows

Table 8| Indicator and typical species of lowland meadows

This list has been compiled to include those species that are particularly indicative of a long period without disturbance and the more typical wildflowers of neutral grassland. This allows proper consideration of sites where only remnants of this habitat are found such as East Berkshire, but which may still support many of the more common typical grassland species.

Indicator Species

Common name	Species
Sneezewort	*Achillea ptarmica*
Lady's mantle	*Alchemilla filicaulis*
Green-winged orchid	*Anacamptis morio*
Betony	*Betonica officinalis*
Quaking grass	*Briza media*
Meadow brome	*Bromus commutatus*
Smooth brome	*Bromus racemosus*
Marsh marigold	*Caltha palustris*
Common yellow-sedge	*Carex demissa*
Distant sedge	*Carex distans*
Brown sedge	*Carex disticha*
Star sedge	*Carex echinata*
Tawny sedge	*Carex hostiana*
Common sedge	*Carex nigra*
Carnation sedge	*Carex panicea*
Meadow thistle	*Cirsium dissectum*
Pignut	*Conopodium majus*
Early marsh orchid	*Dactylorhiza incarnata*
Southern marsh orchid	*Dactylorhiza praetermissa*
Heath grass	*Danthonia decumbens*
Slender spike-rush	*Eleocharis uniglumis*
Fescuelolium hybrids	
Dropwort	*Filipendula vulgaris*
Snake's-head fritillary	*Fritillaria meleagris*
Dyer's greenweed	*Genista tinctoria*
Water avens	*Geum rivale*
Meadow barley	*Hordeum secalinum*

Common name	Species
Bristle club-rush	*Isopelis setaceus*
Round-fruited rush	*Juncus compressus*
Fairy flax	*Linum catharticum*
Tubular water-dropwort	*Oenanthe fistulosa*
Spiny restharrow	*Ononis spinosa*
Adder's-tongue	*Ophioglossum vulgatum*
Marsh lousewort	*Pedicularis palustris*
Lousewort	*Pedicularis sylvatica*
Common milkwort	*Polygala vulgaris*
Tormentil	*Potentilla erecta*
Cowslip	*Primula veris*
Yellow-rattle	*Rhinanthus minor*
Salad burnet	*Sanguisorba minor*
Great burnet	*Sanguisorba officinalis*
Meadow saxifrage	*Saxifraga granulata*
Saw-wort	*Serratula tinctoria*
Pepper saxifrage	*Silaum silaus*
Ragged Robin	*Silene flos-cuculi*
Marsh stitchwort	*Stellaria paulstris*
Devil's-bit scabious	*Succisa pratensis*
Meadow rue	*Thalictrum flavum*
Marsh arrowgrass	*Triglochin palustris*
Marsh valerian	*Valeriana dioica*
Marsh pennywort	*Hydrocotyle vulgaris*
Grass vetchling	*Lathrus nissola*
Narrow-leaved water-dropwort	*Oenanthe silaifolia*
Marsh cinquefoil	*Potentilla palustris*

Typical Species

Common name	Species
Agrimony	*Agrimonia eupatoria*
Sweet vernal grass	*Anthoxanthum odoratum*
Cuckoo flower	*Cardamine pratensis*
Glaucous sedge	*Carex flacca*
Common knapweed	*Centaurea nigra*
Common spotted orchid	*Dactylorhiza fuchsii*
Meadowsweet	*Filipendula ulmaria*
Common marsh-bedstraw	*Galium palustre*
Fen bedstraw	*Galium uliginosum*
Lady's bedstraw	*Galium verum*
Meadow crane's-bill	*Geranium pratense*
Meadow vetchling	*Lathyrus pratensis*
Autumn hawkbit	*Leontodon autumnalis*
Rough hawkbit	*Leontodon hispidus*
Lesser hawkbit	*Leontodon saxatile*
Oxeye daisy	*Leucanthemum vulgare*
Common bird's-foot trefoil	*Lotus corniculatus*
Greater birds-foot-trefoil	*Lotus pedunculatus*
Field wood-rush	*Luzula campesteris*
Creeping Jenny	*Lysimachia nummularia*
Restharrow	*Ononis repens*
Burnet-saxifrage	*Pimpinella saxifraga*
Meadow buttercup	*Ranunculus acris*
Common sorrel	*Rumex acetosa*
Lesser stitchwort	*Stellaria graminea*

Appendix 2: Size Thresholds for Habitats

Table 3| Size thresholds for habitats

	Berkshire		Buckinghamshire		Oxfordshire	
	Total Area (ha)	Threshold (ha)	Total Area (ha)	Threshold (ha)	Total Area (ha)	Threshold (ha)
Deciduous woodland	8475	40			4825	45
Beech and Yew Woodland	437	30			3989	45
Wet woodland	496	6			136	6
Wood-pasture and parkland	1395	55			2286	55
Traditional orchard	114	1			268	2
Lowland calcareous grassland	214	5			808	9
Fens – species poor / swamp	90	4			150	4
Fens – species rich / spring fed	21	1			28	1
Lowland meadows	269	5			1143	10
Lowland dry acid grassland	144	5			56	1
Purple moor-grass and rush pasture	7	2			9	0.25
Lowland heathland	375	8			4	0.5
Reedbeds	42	7			27	4
Open Mosaic Habitat on Previously Developed Land	38	10			276	10
Floodplain grazing marsh	2249				4963	
Eutrophic standing water	1327				1012	

Appendix 3: Contextual Criteria for Wildlife Site Selection

Table 1| Summary of evidence requirements for each of the nine criteria

Criterion	Eligiblity for criterion	
CORE CRITERIA		
1S. Rare or exceptional species features	**Criteria defined in section 5.0 including supporting one or more notable species or supporting an excepional assemblage of species**	Qualifies under core criteria 1S
1H. Rare or exceptional habitats features	**Presence of habitats that are rare in a county context, including degraded habitats, in table 2.**	Qualifies under either core criteria 1H or 2 **AND**
2. Naturalness (habitat quality)	**Presence of habitats as described in section 4.0 OR Provides recognisable semi-natural habitats within a largely urban setting**	
3. Size or extent of features (habitat)	Site exceeds 50 hectares in size with presence of some priority habitat OR Presence of at least one block of habitat that exceeds the threshold areas in Table 3	**EITHER** one or both of criteria 3 or 4
4. Diversity (numbers of species and habitats)	Site includes varied habitats and structures; AND/OR site includes high species diversity	
CONTEXTUAL CRITERIA		
5. Connectivity within the landscape	Site is within or links CTAs, BOAs or substantial areas of similar habitat OR Forms, extends or improves a wildlife corridor or linear site OR Has a buffering effect for other sites or habitats OR Provides permeability for wildlife within the landscape, particularly in an urban context	**OR** two or more of contextual criteria 5-9
6. Fragility	Contains a habitat that could not easily be recreated – see Table 4.	
7. Recorded history and cultural associations	Long-term biological monitoring OR Known historical/cultural significance including presence of ancient monuments or written historical documents.	
8. Value for appreciation of nature	Freely accessible to the public or offer engagement opportunities OR Add to the natural aesthetics of the local area OR Accessible or easily visible from a public right of way.	
9. Value for learning	Used by educational establishments for educational activities aimed at increasing knowledge and understanding about nature OR Used by local groups or organisations to educate people about nature.	

Appendix 4 – Floristic Tables for Plots 1-3

Constant species (those occurring across all 5 quadrats) are highlighted yellow.

Quadrat	**1**	**2**	**3**	**4**	**5**	**Constancy**
Species Recorded within quadrats						
Alopecurus pratensis	5	-	4	5		III
Anoxanthum odoratum	5	-	6	4	-	III
Carastium fontanum	4	5	5	-	-	III
Centaurea nigra	-	4	-	-	-	I
Cynosurus cristatus	8	5	8	4	4	V
Festuca rubra-	4	7	6	8	4	V
Galium aparine	1	-	-	-		I
Holcus lanatus	4	4	4	-	4	IV
Lolium perenne	4	-	-	3	4	III
Plantago lanceolata	3	-	2	2	-	III
Poa trivialis	4	-	4	-		II
Ranunculus acris	5	5	4	4	5	V
Ranunculus repens	-	-	-		1	I
Rumex acetosa	5	6	4	5	5	V
Sanguisorba minor	-	1	-	-	-	I
Trifolium pratense	-	-	3		1	II

Table A7.2.17 Results of Quadrat Survey Plot 1

Quadrat	**1**	**2**	**3**	**4**	**5**	**Constancy**
Species Recorded within quadrats						
Alopecurus pratensis	-	5	5	5	6	IV
Cerastium fontanum	1	1	-	4	1	IV
Cynosurus cristatus	-5	-	-	-	-	I
Festuca rubra-	4	4	5	-	-	III
Holcus lanatus	-	-		4	4	II
Lolium perenne	8	5	5	5	5	V
Plantago lanceolata	-	-	-	2	1	II
Poa trivialis	-	4	4	4	4	IV
Potentilla reptans	-	1	1	2	1	IV
Ranunculus acris	4	6	-	5	4	IV
Rumex acetosa	-	-	1	-	-	I
Trifolium pratense	-	-	-	-	1	I
Bromus hordeaceus	4	5	8	8	7	V
Dactylis glomerata	-	-	-	-	1	I
Taraxacum officinale	-	-	-	1	2	II

Table A7.2.18Results of Quadrat Survey Plot 2

Quadrat	1	2	3	4	5	Constancy
Species Recorded within quadrats						
Anoxanthum odoratum	-	-	-	4	-	I
Bellis perennis	1	-	-	-	1	I
Cerastium fontanum	-	-	-	1	1	IV
Cynosurus cristatus	8	5	-	5	5	IV
Festuca rubra-	-	-	-	5	5	II
Holcus lanatus	-	4	4	5	4	IV
Lolium perenne	7	8	8	4	9	V
Plantago lanceolata	1	-	-	-	-	I
Rumex acetosa	-	4	4	4		III
Trifolium pratense	-	-	4	-	-	I

Table A7.2.19 Results of Quadrat Survey Plot 3

Species Recorded but not in Quadrats
Achillea millefolium
Agrostis capillaris
Arrhenatherum elatius
Bromus hordeaceus
Cerastium arvense
Cirsium arvense
Cirsium vulgare
Crepis capillaris
Dactylis glomerata
Galium aparine
Lotus corniculatus
Phleum pratense
Poa annua
Poa trivialis
Potentilla reptans
Ranunculus acris
Ranunculus repens
Rumex crispus
Rumex crispus
Senecio jacobaea
Senecio jacobaea
Taraxacum officinale
Vicia sativa

Table A7.2.20 Other species recorded but not in quadrats