VOLUME 4: APPENDICES

APPENDIX F – ECOLOGY AND BIODIVERSITY

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APPENDIX F1 – 2018 ECOSUPPORT SURVEY RESULTS

Explanatory Note

Survey work was undertaken by Ecosupport in 2017 and the survey methodology and survey results have been lifted from the submitted 2018 Ecological Impact Assessment for ease of reference.

Please also refer to ES Volume 4, Appendix F2: Ecology Survey Update 2021.

2.2 Ecological Baseline

2.2.1 Data Sources

A data request was submitted to Hampshire Biodiversity Information Centre (HBIC). This provided background data on protected and notable species and protected sites within 2km of the site.

2.2.2 Phase I Survey

The initial Phase I survey was carried out over a number of days by Adam Jessop (Natural England License holder for both Bats and Great Crested Newts) in May 2017 and updated in May 2018. The Phase I survey incorporated a visual assessment of the site and the surrounding landscape, loosely following the methodology outlined within the Joint Nature Conservation Committees (JNCC) *Phase I habitat survey handbook* (2003). The habitats present were described, paying particular attention to their potential to support protected species. A species list was also compiled.

2.2.3 Badger Survey

A systematic search for evidence of Badger (*Meles meles*) was also undertaken. In accordance with the *Badgers and Development: A Guide to Best Practice and Licensing* (Natural England, 2011) guidance, the survey accounted for a 30m from the sites boundary (observed where possible i.e. does not conflict with private dwellings). It consisted of a thorough search for sett entrances, badger paths, latrines, badger hairs, scratching posts and evidence of foraging.

2.2.4 Ground Based Bat Roost Assessment of Trees

All trees were subject to a preliminary roost assessment which is a detailed inspection of the tree from the ground level to look for features (Potential Roost Features PRFs) that bats could use to roost within. PRFs would include woodpecker holes, rot holes, hazard beams, cavities, partially detached Ivy with stem diameters in excess of 50mm, with the aim of identifying any PRFs and then characterise the trees roost potential (i.e. negligible, low, moderate or high)

The survey was carried out in accordance with *Bat Surveys for Professional Ecologists: Best Practice Guidelines3rd Edition* (Collins (ed), 2016) by Adam Jessop (2015-13366-CLS-CLS).

2.2.5 Phase II Bat Surveys

2.2.5.1 Activity Surveys

For a development where the habitat has been assessed as being of low - moderate quality for foraging and commuting bats, the current Bat Conservation Trusts (BCT) *Bat Surveys for Professional Ecologists: Good Practice Guidelines 3rd Edition* (Collins (ed) 2016) suggest activity transect surveys should be conducted throughout the active season (one visit per month April – October) to qualitatively assess the bat activity within the site (***NB October was not carried out during the staff shortages***).

Approximately 15 minutes was spent at each listening point during which passes of species were noted (**Fig 2**). Any passes recorded whilst walking between points was also noted. Both heterodyne (Bat Box Duet, Elekon Bat Scanner) and Anabat SD1 frequency division (for analysis of calls via sonogram) detector was employed during all surveys. All surveys were carried out by Adam Jessop BSc (Hons) MSc (Natural England class level 2 licence number 2015- 13366-CLS-CLS), Dean Swensson (2015-18675-CLS-CLS), Joe Carter and Aaron Domblides, Gemma Renyard and Adam Tollefson

Figure 2. The transect routes used to assess bat activity on site with numbered listening stations.

2.2.5.2 Static Detectors

As per best practice guidance, static bat surveys were also undertaken to facilitate quantitative analysis of data to supplement that collected during the transect surveys. As per guidelines, one static detector (Anabat Express) was deployed per transect and left *in situ* to collect data for five consecutive nights, with care taken to ensure suitable weather conditions for the duration of the survey period once per season (May (spring), July (summer) and October (autumn)). The static detector was positioned so that there were no obstructions to the microphone and at a suitable height to maximise the amount of bat activity recorded. Data

was subsequently analysed using Analook software, with all bat species and passes recorded. The locations the statics were placed during each deployment are shown in **Fig 3** below.

Figure 3. Locations of Anabat Express static detectors deployed on site.

2.2.6 Reptile Survey

A reptile survey was carried out in April 2017 following best practice methodology described in a number of sources (Griffiths & Inns 1998, Froglife 1999, Sewell et al., 2013). Artificial refugia comprising of bitumen roofing felt and corrugated tin were distributed throughout all suitable reptile habitats on site. Seven visits to the site were subsequently undertaken during suitable weather conditions during which all the refugia were checked for the presence of reptiles in combination with a visual observation transect. This involved surveyors remaining vigilant and visually searching for reptiles whilst walking between points. During warm weather reptiles are less inclined to utilise refugia and instead bask in the open.

2.2.7 Dormice Surveys

A number of lengths of hedgerow, considered suitable for Dormice, were identified on site. As a result a dedicated survey took place. Nest tubes were installed at 10-meter intervals along stretches of the hedgerow and along the woodland edges. Nest tubes were made from a stiff plastic folded into a tubular square, 25cm in length with a 5 x 5cm cross-section, with a plywood tray sealing one end. 50 tubes were tied to the underside of suitable branches using wire. These were put in place in March 2017 and then were checked monthly in April and May (with the intention to continue until November 2017 for the presence of and/or evidence of Dormice, such as Dormouse nests and nuts with teeth marks indicative of Dormice. By carrying out the surveys over these months the survey effort achieves a score of >20 for

thoroughness*. Guidelines state that as score should be none less than 20, therefore the survey effort expended was considered to be more than adequate and incorporated two of the best months (August and September).

* *This is based on the standard 50 tubes and Index of Probability of finding dormice present in nest tubes as per Bright et al 2006.*

			[nHR] *Lotus tenuis* [nHR]		
WC0447	Fort Nelson	2A/2B		1.8 km N	Potential minor negative from increased visitor numbers.

3.2 Phase I Survey

The vegetation within the site has been described below using the broad Phase I habitat classification terminology as described with JNCC (2010). The below species noted should not be considered an exhaustive list and instead refer to dominant, characteristic and other noteworthy species associated with each community within the survey area. The habitat types on site comprise:

- Arable field
- Improved grassland
- Tall ruderal
- Scattered scrub
- Hedgerows / tree lines

3.2.1 Arable field

The majority of the site comprises arable stubble field, which is used for summer cereal production with occasional greater plantain (*Plantago major*) (**Fig 6**).

Figure 6. View across the arable field (taken May 2018).

3.2.2 Improved grassland

The margins of the arable field comprise a (roughly 1 – 2 m) strip of unmanaged improved grassland dominated by coarse grasses. Species recorded included *Bromus* spp, Perennial Rye Grass (*Lolium perenne*), Cocks Foot (*Dactylis glomerata*), Common Cleaver (*Galium aparane*), Ivy (*Hedera helix*), *Geranium* spp, *Rumex* spp, Germander Speedwell (*Veronica chamaedrys*), Cow Parsley (*Antriscus sylvestris*), Horsetail (*Hippus vulgaris*), Common Hogweed (*Heracleum sphondylium*) and Lesser Celendine (*Ranunculus ficaria*) (**Fig 7**).

Figure 7. Improved grassland and scrub located along northern boundary.

3.2.3 Tall Ruderal

Small areas of tall ruderal are located along section of the northern and western boundaries as well as adjacent to the southern boundary tree line. This habitat type was largely dominated by Common Nettle (*Urticia dioica*) with Cow Parsley and Field Bindweed (*Convolvulus arvensis*).

3.2.4 Scattered Scrub

Bramble (*Rubus fruiticosus* agg) dominated scrub was asscoaited with the margins of the longer grassland areas on site (particularly along the northern boundary) (as per **Fig 7**).

3.2.5 Hedgerow / Tree lines

The western, eastern and southern boundaries of the site are marked by hedgerows / trees lines of varying levels of maturity / diversity. The western boundary hedgerow was well managed and comprised almost entirely of Hawthorn (*Crataegus monogyna*) and Ivy with eastern half of the southern boundary hedge of a similar composition (with the addition of Sycamore *Acer pseudoplantanus*). The eastern boundary hedgerow was the most diverse and

was well established with a number of mature Elder (*Sambuscus nigra*) specimens. Other species noted included Field Maple (*Acer campastre*), Hawthorn, Blackthorn (*Prunus spinosa*), Rowan (*Sorbus aucuparia*), Alder (*Alnus glutinosa*) and Dog Rose (*Rosa canina*) (**Fig 8**).

The western part of the southern boundary supports a small woodland / tree line which is dominated by Ash (*Fraxinus excelsior*), with Field Maple, Sycamore, Hazel (*Corylus avellana*), Oak (*Quercus* spp) and Blackthorn.

Figure 8. View of the mature eastern boundary hedgerow.

3.3 Badger Survey

During the latest visit to the site to update the Phase I survey (May 2018) a number of signs of Badger activity were noted on site (trails) along with a suspected active sett in the south eastern corner. All recorded Badger activity is on site is shown in **Fig 9** below.

Figure 9. Recorded Badger / mammal activity on site based on the latest walkover undertaken (May 2018).

Based on the activity recorded on site and taking the presence of Badgers on the adjacent Cranleigh Road scheme into account (P/15/0260/OA), it is considered likely the sett on site is an annex to the main sett in the adjacent field (with the wider area used for foraging and commuting).

3.4 Bat Surveys

3.4.1 Activity Surveys

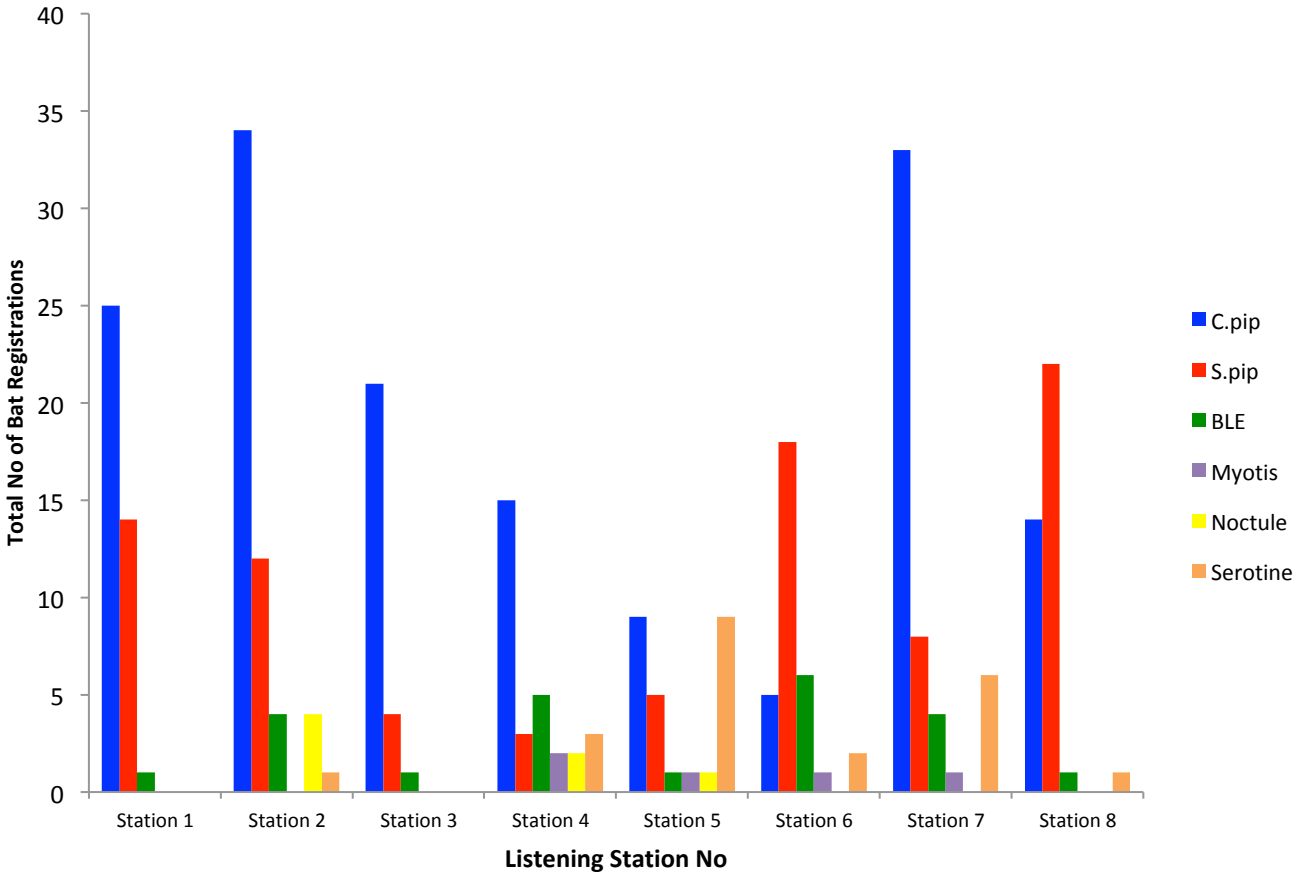
Table 4 below outlines the dates the walked bat activity transects were undertaken along with other pertinent environmental information with the results of the transects presented as a summed total (across all transects form April – October) presented in **Fig 10**.

Table 4. Relevant information recorded during the walked bat activity transects.

Date	Starting Point (listening station number)	Start / Finish Time	Weather Conditions	Direction of Travel
7th April 2017	1	19:36 - 21:20	Overcast, 11°C with light breeze	Counter clock wise (CCW)
14th May 2017	1	20:40 – 22:33	Clear, 13°C, no wind	Clockwise (CW)
7th June 2017	4	21:15 – 23:01	Overcast, 16 °C with light breeze	CW
5th July 2017	8	21:20 – 23:16	Clear skies, 20 °C with light breeze	CCW

14th August 2017	7	20:27 – 22:18	Overcast, 17 °C and breezy	CCW
22nd September 2017	1	19:06 – 21:00	12 °C, partly cloudy	CW

Figure 10. Graphical representation (cluster graph) of the number and species composition of bat recordings noted during the walked transects (n = 6) at the different listening points from all the surveys (April - September totaled).



The activity transects would indicate that listening stations 2 and 7 was the most frequently used (in terms of the total number of registrations) with the southern boundary hedgerow / tree line also fairly frequently used by Serotine. As would be expected given the habitat types *Pipistrellus* spp dominated the calls across most listening stations during all surveys.

3.4.2 Static Detector

Whilst the static detectors were in operation at least six species of bat were recorded on site including Common and Soprano Pipistrelles, Noctule, Serotine, *Myotis* and *Plecotus* spp (**Tables 5 - 7**). The bat recorded in the highest abundance was Common Pipistrelle.

Table 5. Results from the static detector deployment during May 2017 (calls analysed using the Analook software).

May 2017	Bat Passes				
	C.pip	S.pip	*Myotis* spp	Noctule	Serotine
02/05/2017	41	-	3	-	-
03/05/2017	7	-	1	-	-
04/05/2017	28	-	8	-	-
05/05/2017	16	-	5	-	-
06/05/2017	7	2		-	
Total	***99***	***2***	***17***	***0***	***0***

Table 6. Results from the static detector deployment during July 2017 (calls analysed using the Analook software).

July 2017	Bat Passes					
	C.pip	S.pip	*Myotis* spp	Noctule	Serotine	BLE
03/07/2017	88	54	2	-	1	1
04/07/2017	76	58	1	-		6
05/07/2017	122		5	2	22	-
06/07/2017	49	14	8	-	5	-
07/07/2017	50	6	9	-	1	-
Total	***385***	***132***	***25***	***2***	***29***	***7***

Table 7. Results from the static detector deployment during October 2017 (calls analysed using the Analook software).

October 2017	Bat Passes				
	C.pip	S.pip	*Myotis* spp	Noctule	BLE
07/10/2017					
08/10/2017		1		2	
09/10/2017	55		3		
10/10/2017			2		3
11/10/2017	9		1		2
Total	***64***	***1***	***6***	***2***	***5***

3.4.3 Trees

The only mature trees that will be impacted upon by the proposals are the row of Ash in the south western corner that may require removal to enhance sight lines for waders and Brent Geese within the SPA bird reserve. The trees are shown in **Fig 11** with an assessment of any PRFs noted in **Table 8**.

Figure 12. Row of Ash trees proposed for removal in the south western corner of the site (taken from the AIA, Sapling 2018).

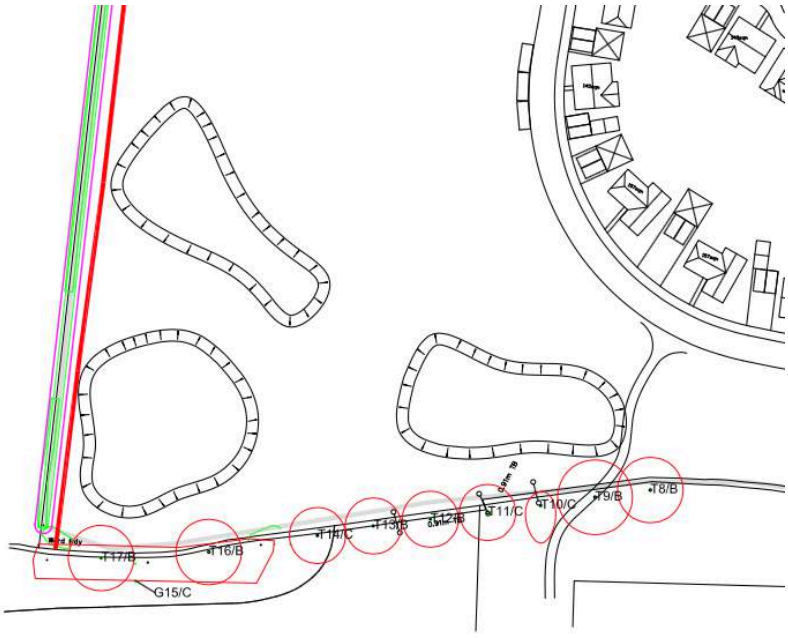


Table 8. Bat roost assessment of trees proposed for removal in south western corner.

Tree Number	Species	Category	PRFs	Assessed Potential
T8	Ash	B	Ivy coverage with a stem diameter of > 50mm.	***Low***
T9	Ash	B	Ivy coverage with a stem diameter of > 50mm.	***Low***
T10	Ash	C	None	***Negligible***
T11	Ash	C	None	***Negligible***
T12	Ash	B	Single rot hole noted although did not appear to have any depth	***Low***
T13	Ash	B	Fissures in stem and occuluded wound noted though didn't appear deep	***Low***
T14	Ash	C	None	***Negligible***
G15	Ash, Field Maple	B	None	***Negligible***
T16	Ash	B	Ivy coverage with a stem diameter of > 50mm.	***Low***
T17	Ash	B	Ivy coverage with a stem diameter of > 50mm.	***Low***

3.5 Reptile Survey

The results of the reptile presence / likely absence survey are presented below in **Table 9** where a ***'Good'*** population (between 5 – 20 adults seen in a single day as per Froglife 1999) was noted on site (max count of 19 adults) (with the vast majority of the reptiles recorded found within the northern boundary grassland strip to he rear of existing houses **Fig 7**).

Table 9. Reptile Survey results. AF = Adult Female, AM = Adult Male, Juv = Juvenile and SW = Slow Worm.

Dates	Time	Temp (°C)	Cloud Cover (%)	Reptiles	Total (Slow Worms only)
4th April 2017	15:25	15	100%	5 AM SW, 13 AF SW, 4 Juv SW	22
6th April 2017	11:00	14	50	7 AF SW, 5 AM SW, 2 Juv SW	11
11th April 2017	12:20	14	50	7 AF SW, 5 AM SW, 5 Juv SW	17
13th April 2017	10:21	13	100	9 AF SW, 4 AM SW, 2 Juv SW	18
21st April 2017	15:00	14	80	10 AF SW, 9 AM SW, 9 Juv SW	31
27th April 2017	16:23	17	100	6 AF SW, 3 AM SW, 11 Juv SW	20
2nd May 2017	14:30	14	30	5 AF SW, 4 AM SW, 5 Juv SW	14

3.6 Dormouse Survey

The Dormouse nesting tubes were distributed throughout all suitable hedgerows on site with a total of 50 tubes used as per best practice (Bright et al., 2006). **Table 10** below indicates the dates the tubes were checked and any evidence of occupation that was recorded. An indication of where any small mammal evidence was found is provided in **Fig 11.**

Table 10. Results of Dormouse nesting tube checks over the 2017 active season.

Month	Points scored as per Bright et al	Evidence	Tube No
15th May 2017	**4**	*None*	-
21st June 2017	**2**	*None*	-
7th July 2017	**2**	*None*	-
22nd August 2017	**5**	*Apodemus* spp feeding cache and partial nest	**T 9**
13th September 2017	**7**	Birds next	**T 35**
20th October 2017	**2**	Disused *Apodemus* spp nest	**T 19**

Figure 11. The location of any evidence of small mammals / bird nests recorded on site (as with adjacent application no Dormice found).

3.7 SPA Birds

3.7.1 Pre Existing Information

Fig 12 below provides the survey information for Brent Geese (*Brantra bernicla*) and waders as provided in the 2002 and 2010 strategies as provided by HBIC. **Table 11** provides more information on the numbers observed in each of the land parcels listed in **Fig 12.**