

Other rivers and streams r2b

A watercourse runs from the west to the east along the southern part of the site (see Figures 38 & 39). This watercourse is semi-natural in nature and has carved a meandering watercourse with relatively steep sides through the broadleaved and semi-natural woodland located within this area. Due to the topography, this area is likely prone to occasional flooding.

As mentioned previously, the water quality is very poor within the site due to the impact from the coarse fishing outflow pipe located at TQ 28897 24268.



Figure 38: View of the watercourse located along the southern site boundary.



Figure 39: View of the same watercourse showing the high levels of sediment loading.

Developed land, sealed surface u1b

This habitat type was confined to the exposed surface of a concrete underground fuel storage facility located at the northern end of grassland parcel G4.

Artificial unvegetated unsealed surface u1c

This habitat was confined to the edges of the edges of the area of gravel/hardstanding parking provision located to the north of grassland Parcel G1 (see Figure 40). Species recorded included daisy *Bellis perennis*, annul meadow grass *Poa annua*, dandelion, scattered individual plants of perennial rye grass, wood avens *Geum urbanum*, dove's-foot cranesbill, white clover and patches of white English stonecrop *Sedum anglicum*.



Figure 40: View of the Artificial unvegetated unsealed surface habitat located on site.

Hedgerows

Native hedgerows were recorded throughout the northern part of the site (see Figures 41–44 & Appendix 1). The parkland areas of the site lacked hedgerows. The hedgerows varied from being of some antiquity to being of more recent origin (the southern, eastern and northern boundaries of grassland Parcels G1 & G2) and varied in terms of management from annual flailing to no apparent management. These are dealt with in more detail below:

Native hedgerow h2a6

These hedgerows were confined to the northern and eastern boundaries of grassland Parcel G1 and the northern and eastern boundaries of grassland Parcel G2. Species recorded included hazel (the general dominant species) with sycamore, hawthorn, ash (with ADB), dog rose, field elm *Ulmus minor*, bramble and blackthorn. Of these, only the northern hedgerow of grassland Parcel G1 was managed in any way, utilising mechanical flail on an annual basis. Of these, the western boundary of grassland Parcel G1 supported trees including a series of mature oak and ash trees.

Species-rich native hedgerow with trees h2a5

These hedgerows were generally unmanaged and had grown tall and bushy (approx. 6m tall x 5 m wide). From studying aerial photographs, these hedgerows date from the time that the broadleaved plantation woodland was planted (circa 1990s). Species were varied with hazel (dominant) with goat willow *Salix caprea*, sycamore, blackthorn, dog rose, field maple *Acer campestre*, hawthorn, dog rose, field elm, rowan *Sorbus*

aucuparia, bramble, grey willow *Salix cinerea*, elder *Sambucus nigra*, ash (with ADB), spindle *Euonymus europaeus*, guelder rose *Viburnum opulus* and holly *Ilex aquifolium*.



Figure 41: View of the northern hedgerows of grassland Parcel G1



Figure 42: View of the eastern hedgerows of grassland Parcel G1



Figure 43: View of the south-western hedgerow of grassland Parcel G2



Figure 44: View of the north-eastern hedgerow of grassland Parcel G2

4.3 Amphibians

The woodland edges, dense scrub edge, hedgerow bases and ponds on site are likely to provide both terrestrial and aquatic breeding habitat for amphibian species, such as common frog *Rana temporaria*, common toad *Bufo bufo*, and palmate newt *Lissotriton helveticus*.

Records for great crested newt have been recorded within the locality and this species is known to be present within the locality. There are a number of ponds located within the site boundary and these were all subject to further survey in the form of Habitat Suitability Index (HSI) and, if required eDNA surveys.

4.3.1 Great Crested Newt Habitat Suitability Index (HSI)

An assessment of each water body's suitability to support a breeding population of great crested newts (GCN) was made according to the criteria of the Habitat Suitability Index (HSI – see Table 4) (Oldham *et al.*, 2000) following the methodology described in the ARG UK Guidance Note 5 (ARG UK 2010). The scores translate into a breeding suitability as shown in Table 7.

4.3.2 Environmental DNA (eDNA)

Ponds A, B, C & D were identified as suitable for water collection during the HSI assessment were the sampled for eDNA. This method involved taking water samples from each water body within Natural England's accepted sampling period of 15th April to 30th June following the methodology described in the Defra Report WC1067 (Biggs *et al.* 2014a) and the subsequent Technical Advice Note (Biggs *et al.* 2014b).

Twenty 30ml water samples were taken from each pond on the 18th April 2023 by Dominic Sheldon and Paul Lott, using sterile field equipment supplied by Applied Genomics. Sample locations were selected based on accessibility and suitable GCN egg laying and displaying areas in combination with the proposed impacts of the restoration works, with as much of the margin being sampled as possible. The surveyor wore sterile gloves whilst taking the sample and did not enter the water. The water column was mixed gently before taking the sample, with care taken not to disturb the sediment at the bottom of the pond. The samples from each pond were mixed and 15 ml added to six sterile tubes containing 35ml ethanol. Ponds containing less than 5cm depth of water were not sampled.

Samples were stored overnight in a refrigerator and then sent to Applied Genomics for analysis. The methodology for laboratory analysis can be provided by Applied Genomics on request.

The results indicate that the site is of **site Importance** to great crested newt with a positive result on likely breeding within one pond on site. This species is likely located throughout the site during its terrestrial phase.

Table 7: Habitat Suitability Index and eDNA Results

Pond No.	Location (OS grid ref)	HSI score	Pond suitability	eDNA survey (Y/N)	eDNA result
1	TQ 29489 25286	0.7963	Excellent	Y	Negative
2	TQ 29018 24372	0.5993	Average	Y	Negative
3	TQ 289632 4392	0.3863	Poor	Y	Negative
4	TQ 292342 4536	0.7885	Good	Y	Positive
5	TQ 28926 24391	0.3378	Poor	N	N/A
6	TQ 28901 24308	0.3324	Poor	N	N/A

Ponds 1-4 were subject to an eDNA survey, of which pond 4 returned positive for GCN eDNA. As such, great crested newt are considered present within the terrestrial habitat on site. Refer to **Appendix 1** for pond locations.

4.4 Badger

No records of badger were returned by SBRC within 1 km of the site. However, Sussex Biological Records Centre (SBRC) state that they do not release their records on this species. However, badger are known to be both widespread, common and are known to be living at relatively high densities for this species within the local landscape.

During the site surveys, one active main badger sett, comprised of seven sett entrances and one apparently disused main badger sett comprising five sett entrances was recorded within the woodland habitats located on site (see Appendix 1). A single entrance outlier of recent construction was also recorded within grassland parcel G5 during one of the bat activity transects.

A further six-entrance, disused former badger sett was located to the north of the site (see Appendix 1). Field signs of badger travelling through the site (pathways and snuffle holes) indicate that the site is of **site Importance** to at least one, possible two badger social group/clan.

4.5 Bats

Numerous records for commuting or foraging bats were returned from the data search from SBRC from within 1 km of the site.

This included records for brown long-eared bat *Plecotus auritus*, unidentified long-eared species *Plecotus* sp., soprano pipistrelle *Pipistrellus pygmaeus*, common pipistrelle *Pipistrellus pipistrellus*, unidentified pipistrelle *Pipistrellus* species, Nathusius's pipistrelle *Pipistrellus nathusii*, Noctule *Nyctalus noctula*, Whiskered bat *Myotis mystacinus*, Brandt's bat *Myotis brandtii*, unidentified *Myotis* sp., serotine *Eptesicus serotinus* and unidentified bat *Chiroptera* species.

On consulting aerial photographs, it is most likely that bats using the local area utilise the flanking woodlands within the site to travel from east to west and from north to south along these strong linear features supporting the commuting of bat species and allowing the access of further foraging grounds/ habitats within the surrounding landscape through the use of other commuting features such as hedgerows, hedgerow trees and woodlands. The veteran (and ancient) sweet chestnut trees within the site are likely to be of interest due to the rich habitats (and therefore likely diverse and abundant invertebrate prey) they provide.

As the main body of the site contains foraging habitat for bats and the site is considered to be of importance for foraging bat species, including noctule, particularly during May – July, when cockchafer beetles *Melolontha sp.* are on the wing.

However, there is an abundance of high quality foraging habitat in the local area comprising woodlands, woodland edge habitats with smaller areas of good-quality semi-improved grassland and river corridors and as such, the importance of the site for foraging bat species is not considered important above the local level.

4.5.1 Roosting Bats

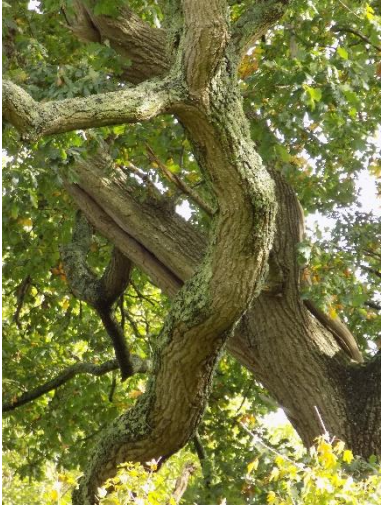
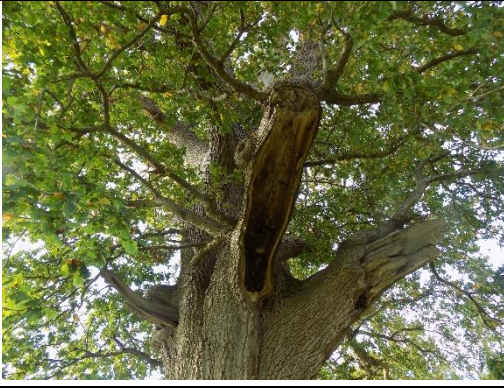
Numerous roost records were returned by SBRC including a single maternity roosts for brown long-eared *Plecotus auratus* and records for general summer roosting for brown long-eared bat *Plecotus auritus*, unidentified long-eared species *Plecotus sp.*, soprano pipistrelle *Pipistrellus pygmaeus*, common pipistrelle *Pipistrellus pipistrellus*, unidentified pipistrelle *Pipistrellus* species, Noctule *Nyctalus noctula*, natterer's bat *Myotis nattereri*, unidentified *Myotis sp.*, serotine *Eptesicus serotinus* and unidentified bat *Chiroptera* species within 2 km of the site.

Trees

No bat roosts were found within trees on Site although a number of trees on site presented potential roosting features (PRFs) that had a moderate to high bat roosting potential. These are discussed in more detail in **Table 8** below:

Table 8: PRFs within Site trees (refer to Appendix 1).

Picture	Description	Potential Roosting Feature category
	Bark flake – Appendix 1	Low
	Woodpecker hole (WPH) – Appendix 1	Low-moderate
	Woodpecker hole – Appendix 1	High

Picture	Description	Potential Roosting Feature category
	Rams horns feature – Appendix 1	Low-moderate
	Multiple features present on veteran ancient sweet chestnut trees – Appendix 1	High
	Impact shatter and rot features – Appendix 1	Moderate - high

Picture	Description	Potential Roosting Feature category
	Woodpecker hole – Appendix 1	High
	Woodpecker hole – Appendix 1	High

Building

The only building located on site supported a large number of features that have the potential to support roosting bats. Gaps under ridge and roof tiles were recorded along with access gaps into the two (locked) rooms within the building providing access into dark areas including access to the ridge beam. As stated earlier, access into the two rooms of the building were not possible so a full assessment could not be undertaken.

A single degraded bat dropping was recorded lying on the edge of the southern facing open area within the building (see Figure 45 below).

It is considered highly likely that the building supports unknown numbers of roosting crevice dwelling bat species including both day and night roosting. The presence of 'breathable membrane' under the ceramic tiles of this building is cause of significant concern as this has been shown to actively entrap and kill bats that come into contact with it.

Within the context of the local area and bearing in mind the presence of numerous roosts for the species recorded from SBRC, the site is considered to be of no more than **Parish Importance** for roosting bats.



Figure 45: View of the same tree with human for scale showing a multitude of veteran and faunal features.

4.5.2 Bat Activity Survey

Manual Bat Activity Transect Survey

The manual bat activity survey identified a moderate level of bat activity for a moderate diversity of bat species, predominately formed by common pipistrelle, with occasional passes from soprano pipistrelle, common pipistrelle, noctule, serotine, and bats from the *Myotis* and *Plecotus* genus.

The activity predominantly comprised of bats recorded along the woodland edges with more limited activity within the central portions of the site as would be expected with reduced commuting habitat present. The site boundaries provide sheltered feeding habitat and sheltered flight lines for bat species.

Survey dates and subsequent weather conditions experienced during the manual bat activity surveys are provided in Table 9.

The manual bat activity survey results are quantified in Table 9, with the cumulative distribution and frequency of the results indicated in Figure 10 (a cumulative survey map for all of the manual bat activity survey visit are presented in Appendix 2).

Table 9. Manual bat activity survey transect dates, timings and weather conditions.

		Temp (°C)	Wind Speed (Beaufort Scale)	Cloud Cover %	Precipitation
17th April 2023 Sunset: 19:59 Start Time: 19:55 End Time: 21:55	Start of Survey	16	1	10	None
	End of Survey	15	0	0	None
20th June 2023 Sunset: 21:18 Start Time: 21:03 End Time: 23:18	Start of Survey	16	0-1	15	None
	End of Survey	15	0	25	None
23rd Sept 2023 Sunset: 18:58 Start Time: 18:43 End Time: 21:45	Start of Survey	13	1	15	None
	End of Survey	12	1	5	None

Table 10. Summary of bat activity recorded during the manual bat activity transect surveys

Species Detected	Number of Bat Passes/Encounters				
	Visit 1	Visit 2	Visit 3	Species Total	Activity Identified
	17 th April 2023	20 th June 2023	23 rd Sept 2023		
Common pipistrelle	11	16	6	<u>33</u>	Foraging; social
Noctule	2	0	0	<u>2</u>	
Soprano pipistrelle	10	11	12	<u>33</u>	Foraging; social
Long eared species	3	0	0	<u>3</u>	
Serotine	1	0	1	<u>2</u>	Foraging
Myotis species	1	1	2	<u>4</u>	Foraging
Total (all bats)	28	28	21	<u>77</u>	

Automated Bat Activity Survey

The automated bat detector survey comprised of four automated bat detectors, deployed for the following periods (See Appendix 2 for static automated bat detector positions):

- 17th to 27th April 2023;
- 20th to 26th June 2023; and,
- 13th to 17th – September 2023.

See Tables 11-14 for a summary of recorded bat activity for each recording location.

Due to the species recorded, the site location, habitat connectivity to large areas of semi-natural woodland and the diverse semi-natural habitats present, the site is considered to be of **parish importance** for commuting bat species.

The static automated bat detector recorded a moderate level of bat activity, including a high diversity of bat species, including at least 14(15) species recorded. Of note is the possible Alcaholic bat *Myotis Alcaholic* recorded during the bat automated surveys.

Table 11: Combined Automated Bat Passes – Location A.

Location A	19th to 23rd April 2023	21 st - 25th June 2023	13 th -17 th Sept 2023	Total
Alcaholic	-	-	-	0
Barbastelle	-	-	1	1
Bechstein's bat	-	-	-	0
Brandt's bat	-	3	-	3
Common Pipistrelle	447	670	476	1593
Daubenton's bat	7	3	20	30
Greater Horseshoe bat	-	-	-	0
Lesser Horseshoe bat	-	-	-	0
Leisler's bat	-	1	-	1
Long-Eared bat	-	2	-	2
Nathusius Pipistrelle	-	2	4	6
Natterer's	2	-	-	2
Noctule	-	4	-	4
No ID Myotis	-	4	2	6
Serotine	-	43	-	43
Soprano Pipistrelle	261	332	19	615
Whiskered Bat	-	-	7	7
			Total	1313

Table 12: Combined Automated Bat Passes – Location B.

Location A	19th to 23rd April 2023	21 st - 25th June 2023	13 th -17 th Sept 2023	Total
Alcathoe	-	2	-	2
Barbastelle	-	-	37	37
Bechstein's bat	-	-	-	0
Brandt's bat	-	7	-	7
Common Pipistrelle	77	719	8456	9252
Daubenton's bat	3	1	2785	2789
Greater Horseshoe bat	-	-	-	0
Lesser Horseshoe bat	-	-	-	0
Leisler's bat	-	-	-	0
Long-Eared bat	-	-	11	11
Nathusius Pipistrelle	-	11	4	15
Natterer's	-	-	95	95
Noctule	-	-	14	14
No ID Myotis	-	2	630	632
Serotine	-	2	-	2
Soprano Pipistrelle	134	195	2549	2878
Whiskered Bat	-	-	1244	1244
			Total	16980

Table 13: Combined Automated Bat Passes – Location C.

Location A	19th to 23rd April 2023	21 st - 25th June 2023	13 th -17 th Sept 2023	Total
Alcathoe	-	-	-	
Barbastelle	2	-	6	8
Bechstein's bat	-	-	-	0
Brandt's bat	1	-	-	1
Common Pipistrelle	35	235	181	451
Daubenton's bat	12	6	22	40
Greater Horseshoe bat	-	-	-	0
Lesser Horseshoe bat	-	-	-	0
Leisler's bat	-	-	2	2
Long-Eared bat	-	-	33	33
Nathusius Pipistrelle	-	4	4	8
Natterer's	6	3	3	6
Noctule	-	6	8	14
No ID Myotis	-	-	40	40
Serotine	-	-	-	0
Soprano Pipistrelle	10	29	80	119
Whiskered Bat	1	-	2	2
			Total	724

Table 14: Combined Automated Bat Passes – Location D.

Location A	19th to 23rd April 2023	21 st - 25th June 2023	13 th -17 th Sept 2023	Total
Alcathoe	-	-	-	0
Barbastelle	-	-	2	2
Bechstein's bat	-	-	-	0
Brandt's bat	-	-	-	0
Common Pipistrelle	60	10	29	99
Daubenton's bat	2	1	2	5
Greater Horseshoe bat	-	-	-	0
Lesser Horseshoe bat	-	-	-	0
Leisler's bat	-	-	-	0
Long-Eared bat	-	-	2	2
Nathusius Pipistrelle	2	-	2	4
Natterer's	1	1	1	3
Noctule	1	7	-	8
No ID Myotis	-	-	-	0
Serotine	-	2	-	2
Soprano Pipistrelle	31	2	19	52
Whiskered Bat	-	-	1	1
			Total	178

4.6 Dormice

The dense scrub, hedgerows and woodland on site provide suitable habitat to support dormice.

Thirteen records were returned by SBRC within 1 km of the site within connecting habitat (nearest location approximately 200 m east of the site). Owing to the number of records, the good connectivity of the habitat within the local landscape in the form of large areas of woodland types and native hedgerows, their presence on site was considered likely.

A total of 100 dormouse nesting tubes were installed on the 18th April 2023 at 20 m intervals within the site boundaries (see Appendix 4 for locations and results).

The tubes were subsequently checked monthly from June to September 2023 (see Table 15 below).

Two dormouse nests were identified on two separate visits in June to October.

The site is considered to be of **Local Importance** for dormouse.

Table 15. Dormouse nesting tube survey results

Dormouse nesting tube locations	Field Signs of Dormouse Use				
	18 th April 2023	20 th June 2023	29 st July 2023	15 th Aug 2023	13 th Sept 2023
Perimeter of survey area	Setup	None	X2 nests recorded	None	X2 nests recorded

4.7 Hedgehog

The scrub, woodland, and hedges will provide shelter and foraging resources for hedgehog.

4.8 Birds

The scrub, hedges and trees provide foraging and nesting opportunities for birds.

However, a total of 37 bird species were recorded, including 27 bird species which are considered to breed within or in the immediate surroundings of the site. See Table 16 for a list of species recorded.

Of the species recorded, four are considered to be of high (red-listed) conservation status under the Birds of Conservation Concern 4: willow tit *Poecile montanus*, marsh tit *Poecile palustris*, skylark *Alauda arvensis*, song thrush *Turdus philomelos*, redwing *Turdus iliacus*, mistle thrush *Turdus viscivorus* and grey wagtail *Motacilla cinerea*. [underlined species considered as breeding within the site].

Three species were recorded which are considered to be of medium (amber-listed) conservation status: dunnock *Prunella modularis*, kingfisher *Alcedo atthis* and meadow pipit *Anthus pratensis*, skylark *Alauda arvensis* and tawny owl *Strix aluco* [underlined species considered as breeding within the site].

Combined survey visit maps are provided in Appendix 6. Survey timings and weather conditions are presented in Table 17 below.

Table 16: Bird species recorded during any of the survey visits

Bird Species	Latin	Breeding	Status
Barn owl	<i>Tyto alba</i>		
Blackbird	<i>Turdus merula</i>	✓	
Blackcap	<i>Sylvia atricapilla</i>	✓	
Blue Tit	<i>Cyanistes caeruleus</i>	✓	
Buzzard	<i>Buteo buteo</i>	✓	
Carrion Crow	<i>Corvus corone</i>		
Chaffinch	<i>Fringilla coelebs</i>	✓	
Chiffchaff	<i>Phylloscopus collybita</i>	✓	
Coal Tit	<i>Periparus ater</i>		
Dunnock	<i>Prunella modularis</i>	✓	Amber
Wood pigeon	<i>Columba palumbus</i>	✓	
Goldcrest	<i>Regulus regulus</i>	✓	
Goldfinch	<i>Carduelis carduelis</i>	✓	
Great Tit	<i>Parus major</i>	✓	
Greater spotted woodpecker	<i>Dendrocopos major</i>	✓	
Green Woodpecker	<i>Picus viridis</i>	✓	
Greenfinch	<i>Chloris chloris</i>	✓	
Grey wagtail	<i>Motacilla cinerea</i>		Red
Jackdaw	<i>Corvus monedula</i>		
Kingfisher	<i>Alcedo atthis</i>		Amber
Magpie	<i>Pica pica</i>	✓	
Marsh tit	<i>Poecile palustris</i>	✓	Red
Meadow Pipit	<i>Anthus pratensis</i>	✓	Amber
Mistle thrush	<i>Turdus viscivorus</i>		Red
Nuthatch	<i>Sitta europaea</i>	✓	
Pheasant	<i>Phasianus colchicus</i>	✓	
Pied wagtail	<i>Motacilla alba</i>		
Redwing	<i>Turdus iliacus</i>		Red
Robin	<i>Erithacus rubecula</i>	✓	
Skylark	<i>Alauda arvensis</i>	✓	Amber
Song Thrush	<i>Turdus philomelos</i>	✓	Red
Swallow	<i>Hirundo rustica</i>		
Tawny owl	<i>Strix aluco</i>	✓	Amber
Tree creeper	<i>Certhia familiaris</i>	✓	
Willow tit	<i>Poecile montanus</i>	✓	Red
Wood Pigeon	<i>Columba palumbus</i>	✓	
Wren	<i>Troglodytes troglodytes</i>	✓	

Table 17. Breeding bird survey dates, timings, and weather conditions

Date & Times	Start/End	Temp (°C)	Wind Speed (Beaufort Scale)	Cloud Cover %	Precipitation
29 th April 2023	Start of Survey	14	2	35	0
Start Time: 06:00 End Time: 08:30	End of Survey	16	3	40	0
13 th May 2023	Start of Survey	10	4	90	0
Start Time: 05:53 End Time: 08:21	End of Survey	11	5	95	0
26 th May 2023	Start of Survey	10	1	70	0
Start Time: 07:00 End Time: 9:50	End of Survey	14	3	25	0
21 st June 2023	Start of Survey	17	1-2	25	0
Start Time: 8:00 End Time: 10:00	End of Survey	18	2-3	50	0

4.9 Reptiles

The dense scrub, field parcel verges, woodland edge and hedgerow base provide suitable habitat for common reptile species such as slow worm *Anguis fragilis*, common lizard *Zootoca vivipara* and grass snake *Natrix natrix*.

Reptile survey

The artificial reptile refugia were laid on the 17th April 2023, with 200 refugia set out on site and allowed to 'bed in' for a period of seven days (see Appendix 4). Following the setting up of refugia, a further 7 visits were undertaken in total during May & June 2023. The weather conditions and results of the survey visits are presented in Table 18 below.

The reptile survey identified a 'good' population of slow worm (Froglife, 1999) and a 'good' population of glass snake.

Table 18: Results of the reptile survey

Visit	Date and Time	Environmental conditions		Reptiles
1	3 rd May 2023 08:00	Temp. (°C): Cloud cover (%): Wind (Beaufort scale):	10 35 2	X2 grass snake (juv), X2 adult female slow worm, X1 male slow worm X2 juv slow worm
2	13 th May 2023 08:00	Temp. (°C): Cloud cover (%): Wind (Beaufort scale):	10 50 3	Slow worm: 1 x Adult male, x1 adult female, x2 juv grass snake.
2	25 th May 2023 16:15	Temp. (°C): Cloud cover (%): Wind (Beaufort scale):	17 15 3	X1 adult grass snake, x1 sub-adult grass snake, x4 juv grass snake, x1 adult female slow worm, x2 subadult slow worm, x2 juvenile slow worm.
3	20 th June 2023 16:15	Temp. (°C): Cloud cover (%): Wind (Beaufort scale):	18 15 2	X1 adult grass snake, x2 juv grass snake, x2 adult female slow worm, x2 adult male slow worm, x2 juv slow worm
4	25 th June 2023 16:15	Temp. (°C): Cloud cover (%): Wind (Beaufort scale):	28 25 3	X1 adult grass snake, x5 juv grass snake, x1 male slow worm, x1 female slow worm
5	6 th July 2023 16:00	Temp. (°C): Cloud cover (%): Wind (Beaufort scale):	20 0 1	Slow worm: x1 female. Grass snake: x1 juvenile and x1 adult.
6	7 th July 2023 08:30	Temp. (°C): Cloud cover (%): Wind (Beaufort scale):	22 65 3	X1 adult grass snake, x1 juv grass snake, x1 adult female slow worm
7	29 th July 2023 10:30	Temp. (°C): Cloud cover (%): Wind (Beaufort scale):	20 50 1	X6 adult grass snake, x1 juv grass snake, x2 shed grass snake skins.

4.10 Non-native Invasive Botanical Species

Rhododendron ponticum and least duckweed *Lemna minuta*, both listed on Schedule 9 of the Wildlife and Countryside Act 1981 as a non-native invasive species, were present on site.

Winter heliotrope *Petasites pyrenaicus* was found to be present at the south-western extent of the site, whilst not listed under the Wildlife & Countryside Act, Schedule 9, this is also a non-native invasive species and should be removed from the site.

4.11 Aquatic Invertebrates

Sampling of the aquatic flora and fauna within the ponds was carried out on 12th July 2023, during a period of warm sunny weather. The previous June and late May had seen a prolonged period of warm weather and low rainfall, such that the various watercourses noted on the habitat map had been dry for some time.

Upon visiting the plotted location of Pond 3, this was revealed to be a basin at the edge of woodland that was densely overgrown with brambles *Rubus fruticosus* agg. and other ruderal vegetation, with trees rooted in the basin and no evidence of standing water. Unlike the other three ponds within the site, no pond is marked at this location on earlier Ordnance Survey maps of the area, suggesting that this is instead an ephemeral waterbody at best that occasionally fills with run-off from the adjacent field following heavy rain; thus, only ponds 1, 2 and 4 were subsequently surveyed.

The lists of aquatic invertebrate taxa recorded from the ponds are presented in Table 19. Table 19 contains the environmental parameters, plant species lists, PSYM metrics and CCI values.

Pond 1

This pond is considered likely to have been a former stock watering pond as it is a relatively small pond enclosed by fencing at the south-western corner of grassland pasture G5. The stock fencing of the basin has led to further the dense growth of trees and scrub around the margins of the basin predominately of grey willow *Salix cinerea* around the pond edge, with oak *Quercus robur* and intermixed birch *Betula sp.* and blackthorn *Prunus spinosa* closer to the fence. This overhangs and completely shades the pond basin, with some of the willows having collapsed and fallen into the pond and subsequently rooted within the water. The pond is now very shallow with a considerable drawdown zone evident and just 0.5m depth of water at its deepest point, above a deep layer of rotting leaves and woody debris, overlying a clay base. The entire water surface was covered with a thick carpet of the invasive least duckweed *Lemna minuta* (as listed on Schedule 9 of the Wildlife & Countryside Act 1981) which further shades the water and was the only flora present in the pond. Aquatic invertebrate meso-habitats were limited to mats of submerged willow roots, consequently the invertebrate community was extremely poor in both numbers and diversity, the least diverse of the three ponds in the survey.

Whilst PSYM classified the pond as being of 'very poor' ecological quality, the CCI indicated a community of 'high' interest, but this highlights one of the prime weaknesses of this index, which does not work when based on communities of very few taxa; just two scoring taxa were present, resulting in an artificial elevation of the result. It is more likely that the community is of 'moderate' interest based on the presence of larvae of the uncommon diving beetle *Acilius sulcatus*, Empty *Limnephilus* caddis larval cases amongst the debris at the base of the pond indicated they formerly

occurred in this pond, possibly at a time when it was much more open and provided a suitable haven for a more diverse community.

Smooth newts *Lissotriton vulgaris* were collected in the net during invertebrate sampling indicating the pond's use as a breeding site.

Pond 2

Pond 2 was the most open of the four ponds and was subsequently the most diverse in terms of both its flora and fauna, although it too appears to be in the later stages of succession and its flora and fauna were still somewhat restricted for a lowland pond in southern England. Ancillary features, including a stile to cross the fence, a crude bridge to access a small island and a short reach of open margin on its south-western edge, suggest that it was once used as a fishing pond, although no evidence of fish were noted during the survey.

As with Pond 1, the basin lays within a fenced enclosure in open pasture (grassland parcel G4). Trees and shrubs, mostly of *Salix cinera*, with intermixed *Q. robur* and *P. spinosa* almost entirely surround the pond, with the exception of the aforementioned open margin on the southern side of the pond, with overhanging branches shading much of the margins. Several willows have collapsed and fallen into the north-western corner, which is heavily shaded, and willows have rooted in the water on the northern side of the main basin. Silt has accumulated around their bases forming an elongated 'floating' island, reached by a crude plank bridge. The southern margin of the pond is less shaded, which has allowed the growth of a few scattered marginal plants, including water mint *Mentha aquatica*, water plantain *Alisma plantago-aquatica*, gypsywort *Lycopus europaeus*, creeping bent *Agrostis stolonifera*, blunt-fruited water-starwort *Callitriche obtusangula* and occasional clumps of rushes *Juncus sp.* A similar community has also developed around the western side of the island, where less shaded by overhanging branches.

The open water in the middle of the basin is shallow, approximately 0.5m to 1m deep, overlying a clay base, vegetated in places with *Spirogyra* algae. The margins are relatively steeply sloping, which has perhaps hampered the development of more extensive marginal floral communities, since the margins are much less shaded than Ponds 1 and 4. It is also surprising that a more diverse community of submerged plants has not developed, as the water is relatively clear and lacking the thick coverage of *Lemna* characteristic of the other two ponds, although this could be testament to a

past legacy of fish stocking, despite the apparent lack of their presence during the survey. Carp are bottom-feeders and as such they tend to stir up the substrate causing murky conditions that hinder the establishment of submerged plant species, thus a recent absence of fish would suggest that first algae have begun to colonise the pond, with aquatic plant species to follow in subsequent years.

The aquatic invertebrate community was fairly diverse, although still somewhat restricted for a pond of this nature, with much of the water being relatively open and lacking in vegetation, aside from algal mats, and the majority of the fauna being present amongst the marginal vegetation along the southern margin and around the western edge of the island, and submerged *Salix* root mats. The CCI indicated an assemblage of 'fairly high' conservation interest. It was because of the presence of this fairly diverse invertebrate community, including a few species that have restricted distributions nationally although not uncommon in Sussex, that PSYM classified Pond 2 as being of 'good' ecological quality, although the Index of Biotic Integrity (78%) was only just over the threshold value of 75%. PSYM relies on Family taxonomic level data only and an examination of the actual species present in fact suggests a somewhat more restricted beetle fauna than one would expect in such a lowland pond. However, the disappearance of many such ponds from the wider British landscape over recent decades serves to highlight how even what might be thought of as a relatively poor pond botanically, is considered to be of ecological importance.

Other species of note observed during the survey included smooth newt adults and larvae, as well as adult common blue damselflies *Enallagma cyathigerum* and a solitary migrant hawket *Aeshna mixta*. Nymphs of the latter, along with those of the emperor dragonfly *Anax imperator* and red-eyed damselfly *Erythromma najas* indicate the pond as a breeding site.

Pond 4

Pond 4 lies at the edge of woodland at the northern edge of the site and, as with Pond 1, is both heavily shaded by surrounding trees and in the advanced stages of succession, resulting in restricted floral and faunal communities. The pond is relatively large in area with a substantial drawdown zone evident at the time of the survey. It is fed by run-off from the adjacent fields and woodland, with a dry overflow channel in the northern corner. The central basin consists of a very shallow layer of water, just 10 to 20cm in depth, overlying a deep layer of silt and decaying leaves and woody debris, above what is assumed to be a clay base. The entire water surface is covered with a

dense carpet of the invasive Schedule 9 listed least duckweed and approximately 55% of the pond surface is shaded by overhanging tree branches. In the north-eastern corner two fallen trees have opened up the canopy and there is a small stand of vegetation growing on the marginal mud. This is composed of a bed of greater reedmace *Typha latifolia*, with rare, intermixed bittersweet *Solanum dulcamara*, and a fringe of *Lycopus* and brooklime *Veronica buccabunga* behind, and is likely to be the remnants of a community that was more widespread across the basin before the maturing tree canopy shaded it.

PSYM classified the pond as 'very poor,' and due to the limited diversity of meso-habitats, essentially limited to the shallow open water and occasional marginal willow roots, the aquatic invertebrate assemblage was limited in both diversity and numbers and of 'low' conservation interest.

Table 19: Lists of aquatic invertebrate taxa

TAXA	POND 1		POND 2		POND 4	
	Nos.	Relative Abundance	Nos.	Relative Abundance	Nos.	Relative Abundance
OLIGOCHAETA	6	18.18	11	3.09	5	8.20
HIRUDINEA						
GLOSSIPHONIIDAE <i>Helobdella stagnalis</i>			54	15.17	5	8.20
CRUSTACEA						
ASELLIDAE <i>Proasellus meridianus</i>	4	12.12	15	4.21		
ZYGOPTERA						
COENAGRIONIDAE <i>Erythromma najas</i>			1	0.28		
Coenagrionidae sp. (indet.)			7	1.97		
ANISOPTERA						
AESHNIDAE <i>Anax imperator</i>			1	0.28		
<i>Aeshna mixta</i>			3	0.84		
EPHEMEROPTERA						
BAETIDAE <i>Cloeon dipterum</i>			22	6.18	17	27.87
HEMIPTERA						
HYDROMETRIDAE <i>Hydrometra stagnorum</i>			1	0.28		

TAXA	POND 1		POND 2		POND 4	
	Nos.	Relative Abundance	Nos.	Relative Abundance	Nos.	Relative Abundance
GERRIDAE						
<i>Gerris lacustris</i>			3	0.84		
<i>Gerris</i> sp. (nymphs)			3	0.84		
NOTONECTIDAE						
<i>Notonecta glauca</i>			3	0.84		
<i>Notonecta obliqua</i>			1	0.28		
<i>Notonecta</i> sp. (nymphs)			6	1.69		
NAUCORIDAE						
<i>Ilyochoris cimicoides</i>			2	0.56		
CORIXIDAE						
<i>Corixa punctata</i>			26	7.30		
<i>Corixa</i> sp. (nymphs)			10	2.81		
<i>Sigara dorsalis</i>			6	1.69	1	1.64
<i>Hesperocorixa linnaei</i>			1	0.28		
<i>Hesperocorixa sahlbergi</i>			8	2.25	1	1.64
MEGALOPTERA						
SIALIDAE						
<i>Sialis lutaria</i>			1	0.28		
DIPTERA						
CHIRONOMIDAE						
Chironomidae sp.	14	42.42	161	45.22	8	13.11
CERATOPOGONIDAE						
<i>Palpomyia / Bezzia</i> gp.			1	0.28		
CULICIDAE						
<i>Culiseta alaskaensis</i> gp.	3	9.09			5	8.20
TABANIDAE						
<i>Chrysops</i> sp.					1	1.64
PTYCHOPTERIDAE						
<i>Ptychoptera</i> sp.					2	3.28
CHAOBORIDAE						
<i>Chaoborus flavicans</i>					2	3.28
<i>Chaoborus crystallinus</i>	1	3.03	1	0.28	1	1.64
COLEOPTERA						
SCIRTIDAE						
<i>Cyphon</i> sp. (larvae)					3	4.92
PAELOBIIDAE						
<i>Hygrobia hermanni</i>			1	0.28		

TAXA	POND 1		POND 2		POND 4	
	Nos.	Relative Abundance	Nos.	Relative Abundance	Nos.	Relative Abundance
HELOPHORIDAE						
<i>Helophorus minutus</i>			2	0.56		
DYTISCIDAE						
<i>Acilius sulcatus</i>	3	9.09	2	0.56		
<i>Hydroporus palustris</i>					2	3.28
<i>Hydroporus</i> sp. (larvae)	2	6.06				
<i>Laccophilus minutus</i>			2	0.56		
<i>Hyphydrus ovatus</i> (larvae)			1	0.28	8	13.11
Nos. Identified Taxa	7		25		14	
Total Nos. of Invertebrates	33		356		61	

Table 20: Environmental data, plant lists, PSYM metrics and CCI values

Site details			
Site name	Pond 1	Pond 2	Pond 4
Grid reference	TQ 29014 24372	TQ 29272 24536	TQ 29487 25285
Environmental variables			
Altitude (m)	66	77	110
Shade (%)	100	40	55
Inflow (0/1)	0	0	0
Grazing (%)	0	0	0
Conductivity (µS/cm)	226	351	377
pH	6.29	6.89	6.81
Emergent plant cover (%)	0	<1	5
Pond Base			
Clay/Silt (1-3)	3 (100%)	3 (100%)	3 (100%)
Area (m ²)	400	1400	1500
Plant species			
Submerged	None	None	None
Floating-leaved	<i>Lemna minuta</i>	<i>Lemna minor</i>	<i>Lemna minuta</i>
Emergent / Marginal	None	<i>Alisma plantago-aquatica</i> , <i>Juncus inflexus</i> , <i>Juncus effusus</i> , <i>Juncus bufonius</i> , <i>Mentha aquatica</i> , <i>Agrostis stolonifera</i> , <i>Pulicaria dysenterica</i> , <i>Equisetum telmateia</i> , <i>Carex pendula</i> , <i>Epilobium parviflorum</i> ,	<i>Typha latifolia</i> , <i>Veronica beccabunga</i> , <i>Lycopus europaeus</i> , <i>Solanum dulcamara</i> , <i>Carex remota</i> ,

		<i>Galium palustre</i> , <i>Lycopus europaeus</i> , <i>Callitriche obtusangula</i>	
Bryophytes	None	None	None
Algae	None	<i>Spirogyra sp.</i> , <i>Microspora sp.</i>	None
Plant metrics			
No. of submerged + marginal plant species (not including floating leaved)	0	12	4
Predicted (SM)	18.2	23.2	23.7
EQI (SM)	0	0.5	0.2
IBI (SM)	0	2	0
Number of uncommon plant species	0	1	0
Predicted (U)	3.2	4.1	4.2
EQI (U)	0	0.2	0
IBI (U)	0	0	0
Trophic Ranking Score (TRS)	0	8.43	9.5
Predicted (TRS)	8.81	8.79	8.8
EQI (TRS)	0	0.96	1.08
IBI (TRS)	0	3	2
Invertebrate metrics			
ASPT	2.75	4.44	3.33
Predicted (ASPT)	5.1	5.07	5.09
EQI (ASPT)	0.54	0.88	0.65
IBI (ASPT)	0	3	1
Odonata + Megaloptera (OM) families	0	3	0
Predicted (OM)	3.42	3.15	3.27
EQI (OM)	0	0.95	0
IBI (OM)	0	3	0
Coleoptera families	1	3	1
Predicted (CO)	3.77	3.72	3.73
EQI (CO)	0.26	0.81	0.27
IBI (CO)	1	3	1
Community Conservation Index (CCI)	20	13.1	1.33
Average Conservation Score (CS)	4	2.62	1.33
Community Score (CoS)	20	5	1
Conservation Interest	Moderate (High??)	Fairly High	Low

PSYM Analysis results			
Sum of Individual Metrics	1	14	4
Index of Biotic Integrity (%)	6%	78%	22%
PSYM quality category (IBI >75%=Good, 51-75%=Moderate, 25-50%=Poor, <25%=V Poor)	Very Poor	Good	Very Poor
Is this a Priority Pond? (Good quality category)	No	Yes	No

Photographs and sketch maps of the ponds



Figure 46: View of Pond 1

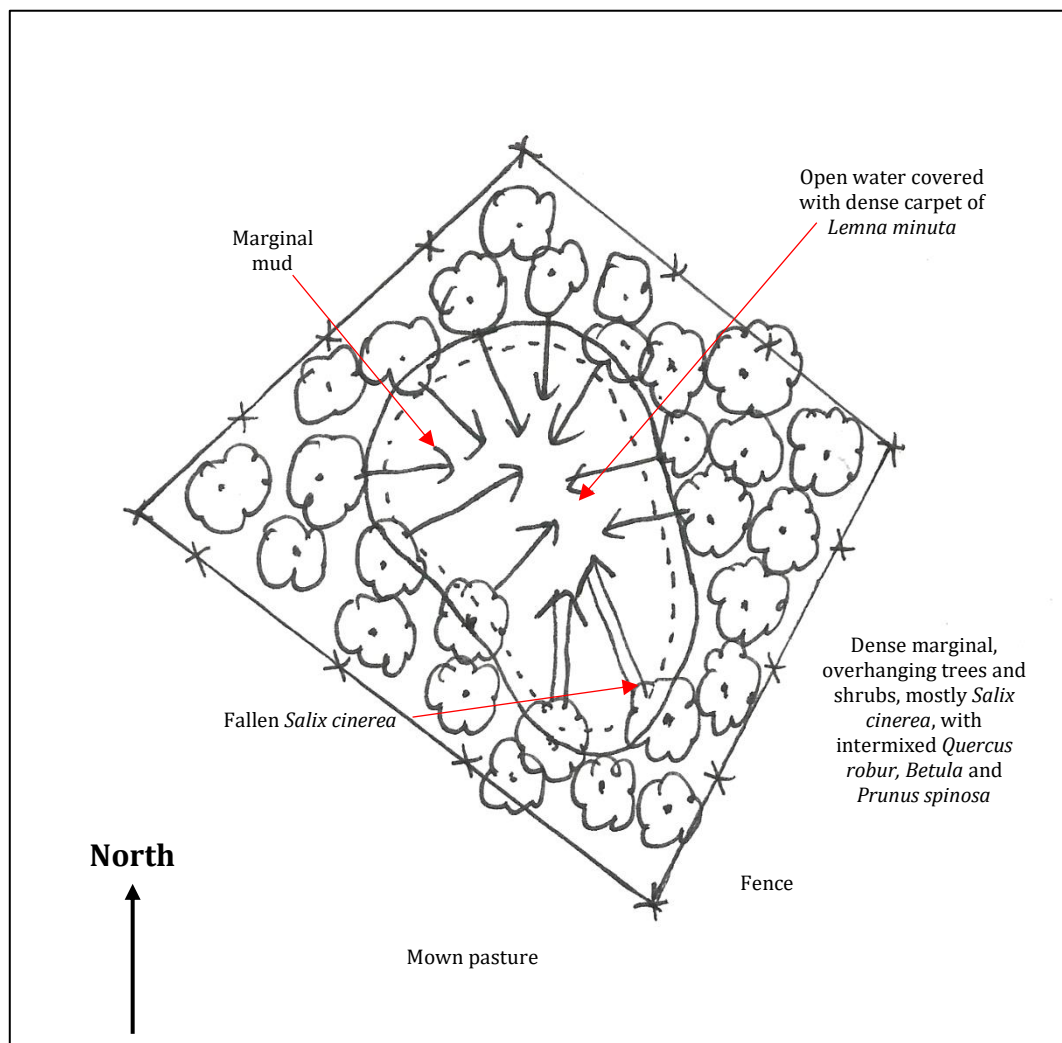
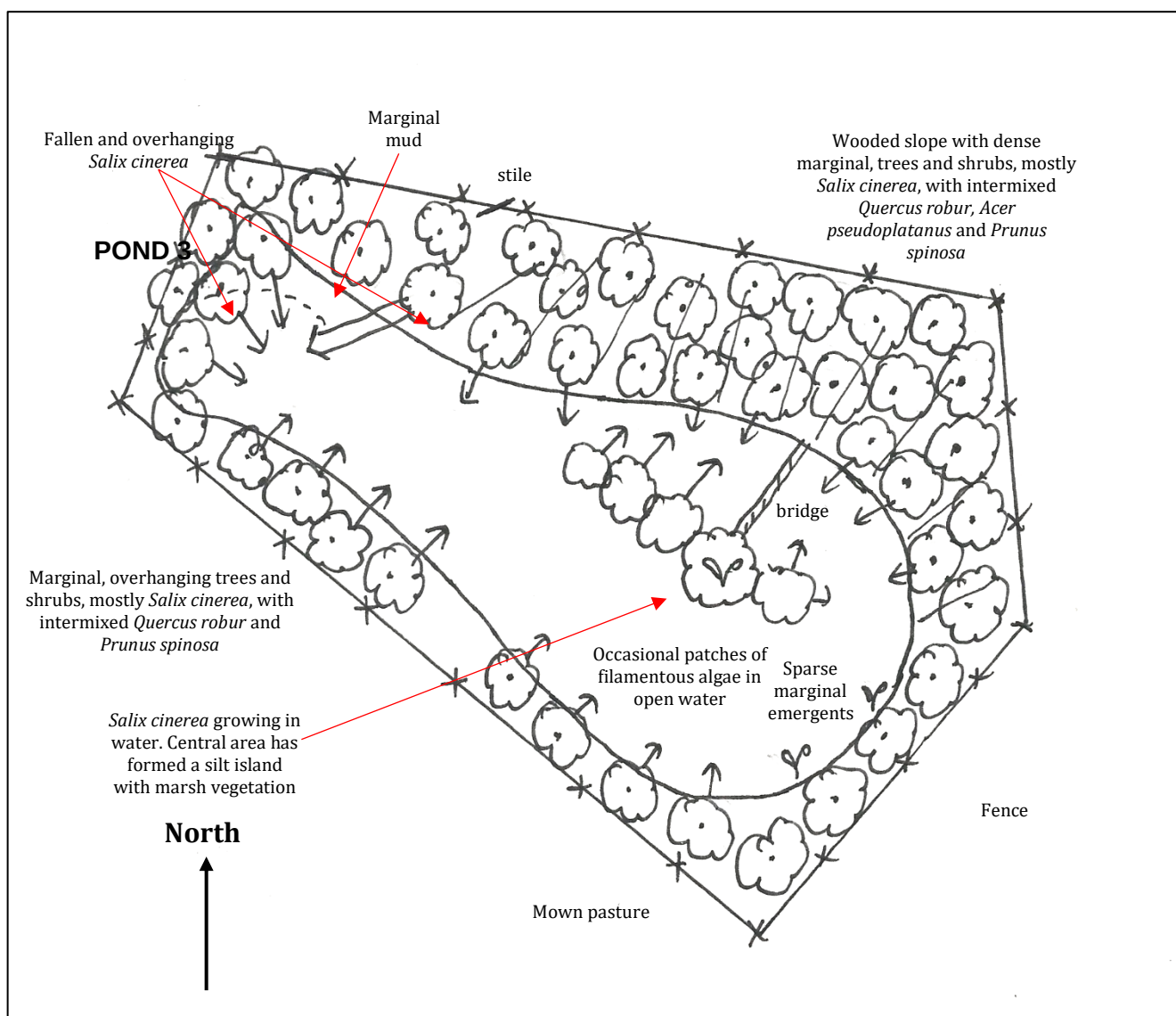


Figure 47: Sketch map of Pond 1



Figures 48 & 49: View of Pond 2

Figure 50 (below): Sketch map of Pond 2





Figures 51 & 52: View of the dried up bed of Pond 3.



Figure 53: View of Pond 4

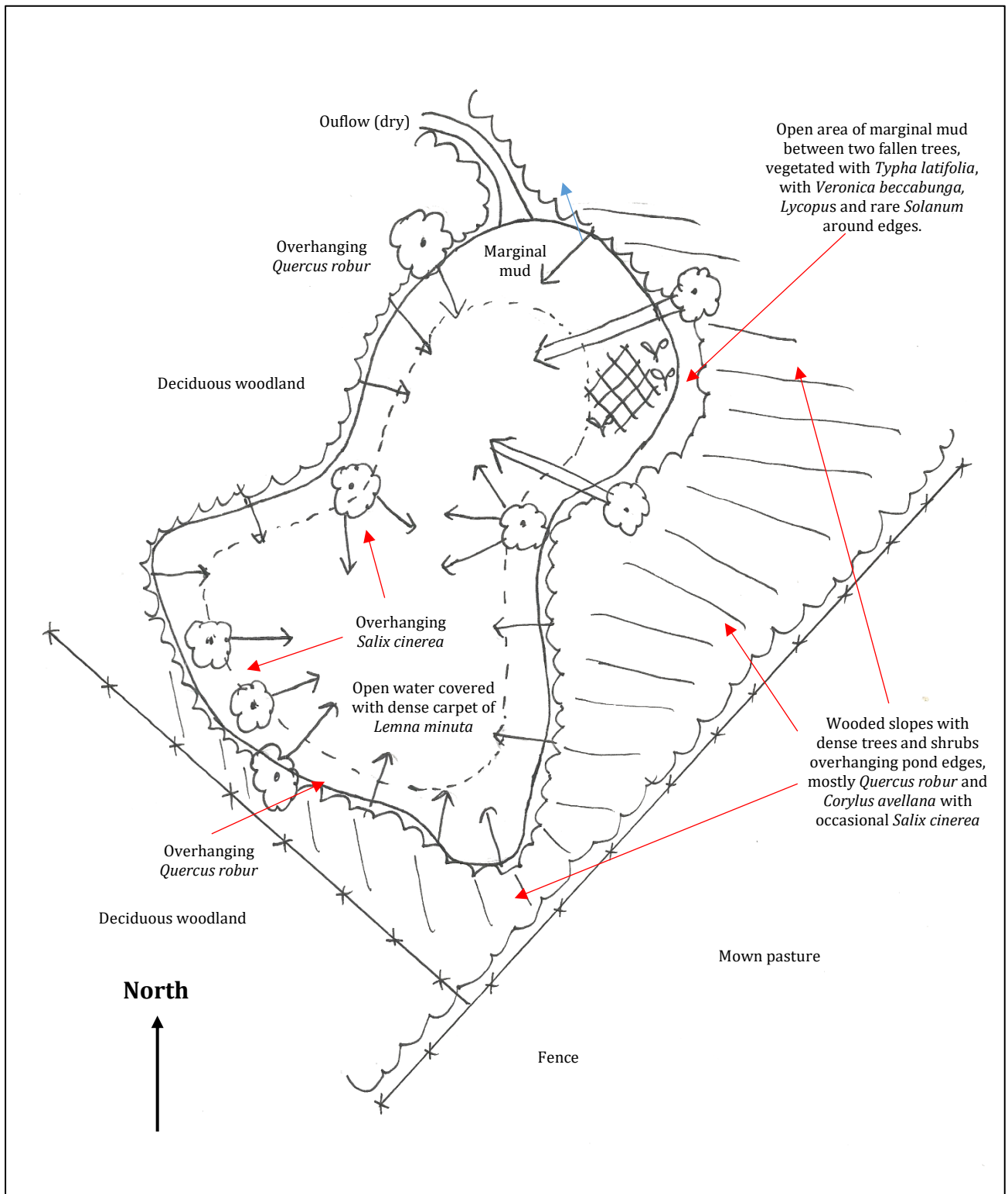


Figure 54: Sketch map of Pond 4

4.12 Otter

No evidence of otter was recorded during the field surveys located on site. However, otter are known to be within every catchment in England, including within Sussex from 2016. Otter are considered to be widespread, but at a low density within the local landscape and as such are considered likely to transit through the site during foraging/dispersal. Otter are considered as likely to utilise the watercourse throughout the year.

4.13 Water Vole

The combined results of both surveys found no evidence of water vole presence along the watercourse (River Adur) which was split in two sections for the purpose of the survey (Figure 55). The suitability of the habitat was also assessed at the time and found to be of negligible value along the River Adur as it was found to have poor habitat suitability.

Table 21: Summary of the habitat suitability for water vole at each watercourse

Watercourse ID	Habitat Suitability	Comments
North side of River Adur	Negligible value	Very dense riparian vegetation, largely trees with dense patches of nettle. Bankside profile unsuitable throughout being steep sided and heavily shaded. River supports very little in the way of vegetation and is located within a woodland and is therefore heavily shaded.
South side of River Adur	Negligible value	Very dense riparian vegetation, largely trees with dense patches of nettle. Bankside profile unsuitable throughout being steep sided and heavily shaded. River supports very little in the way of vegetation and is located within a woodland and is therefore heavily shaded.



Figure 55: View of River Adur

5.1 Proposed Development

It is proposed to develop the site, currently known as Cuckfield Park, into Beechy Bottom Parkland Reserve. Proposed plans indicate that the site will be developed to include enhanced public access and associated infrastructure, together with large areas set aside for a non-deterministic approach to habitat and species restoration as a goal, which the author has termed “constrained rewilding”.

This approach is drawing on the theoretical work on equilibrium and non-equilibrium ecology and conservation to show the options for ecological management and restoration, this has led to a number of ‘rewilding’ outcomes, there are:

1. Continuation of the “status quo” i.e. conserving pre-modern agricultural landscapes (equilibrium ecology and conservation);
2. Soft re-wilding – a hybrid equilibrium/non-equilibrium ecology and conservation);
3. Non-deterministic approach to goal setting which the author has termed “constrained rewilding” (non-equilibrium ecology and conservation); and,
4. Re-wilding (non-equilibrium ecology and conservation) – introduction of apex predators and keystone species.

For the purpose of this development, the proposal is to try to achieve a non-deterministic approach, termed “constrained rewilding” (option 4).

5.2 Statutory & Non-statutory Designated Sites

The desk-based review identified no internationally designated (Natura 2000) sites for nature conservation within 10 km of the site boundary. One statutory designated site and two non-designated statutory sites within 1 km of the site.

The statutory designated site are associated with the High Weld Area of Outstanding Natural Beauty (AONB). The proposed development has the potential to incrementally increase the footfall (in combination with other current and proposed developments) within the statutory sites due to the incremental increase in residents in close proximity to the development in combination with the creation of a new footpath network.

However, it is noted that the High Weld Area of Outstanding Natural Beauty (AONB) already experiences a high level of recreational use. It is understood that Natural

England will be consulted through the planning process regarding current recreational pressures and whether the development is perceived to include potential for an incremental 'in combination' impact to these designated sites. East Sussex operates a compensation scheme to offset any perceived impacts to the statutory designated sites. It is anticipated that a payment may be requested to compensate for the potential incremental increase in recreational impact caused by the development.

From the habitat and species restoration works proposed, no direct adverse impacts are predicted to affect the Natura 2000 sites within 10 km of the site.

There are no perceived direct impacts to the LWS located within 1 km of the site as they are separated from the site by roads and rural landscape. The Local Geological Site is also separated from the site and is unlikely to be impacted by an increase in pedestrian access in any way.

5.3 Habitats and Flora

5.3.1 Grassland Habitats

Modified Grassland g4

Grassland parcels G1, G2, G3 & G6 are to be retained as modified grassland for public use (sports pitches, sporting facilities and purpose-built dog walking). Bar the loss of small areas of this habitat for the creation of a series of footpaths, the modified grassland parcels G4 and G5 will be subject to the proposal is to try to achieve a non-deterministic approach, termed "constrained rewilding". Through the introduction of low numbers of carefully monitored rare-breed cattle and pigs, the aim is to transition this habitat to a more species-diverse tussocky sward with a woody scrub component. This is envisioned to mitigate for the loss of a small area of this low conservation value grassland by the creation of, over time, a high value habitat.

The grassland parcels G1 – G4 will be retained as modified grassland and utilised for public amenity purposes. As such, no impacts to the modified grassland within these parcels is anticipated.

The modified grassland habitat which exists within parcels G4 & G5, if the proposed management techniques are followed, is likely to develop into a more species and structurally diverse sward interspersed with scrub, over time. Grassland parcels G4 &

G5, is considered to likely slowly transitions away from the modified grassland habitat, creating a more high-value habitat measuring approximately 34.99 ha. The existing habitat type is both very widespread and has little in the way of conservation value. As such the impacts to the loss of the modified grassland located within grassland parcels G4 & G5 is considered to be at a site level only.

This transition of these grassland parcels away from modified grassland into a more species-rich sward, interspersed with woody scrub, is considered to be major positive impact in terms of biodiversity at a parish level.

The modified grassland parcels G4 & G5 are also designated as (secondary codes) *wood-pasture and parkland w(26)* and support a number of *mature parkland trees (203)* and *veteran & ancient trees (205)*. These features are of significant nature conservation value and should be retained and protected at all costs.

No direct impacts from the proposed development (foot and cycle path network with associated infrastructure) are anticipated to these secondary code receptors. However, there is a small risk of impacts to the veteran and ancient trees from anti-social behaviour, in the absence of mitigation. To mitigate for this, the addition of hedgerow buffer planting directly adjacent to the fence of the newly proposed footpaths will likely minimise the ability of pedestrian access into the site reducing the likelihood of this occurring.

Other Neutral Grassland g3c

A relatively small area of this habitat of other neutral grassland is present towards the southwest of grassland parcel G5 in an area that has been abandoned agriculturally. This habitat was also recorded within the field margins surrounding the large, modified grassland parcels G4 & G5.

No direct or indirect impacts to these areas of habitat are anticipated from the proposed development, as there are no plans to impact the area which has been agriculturally abandoned, and, the field margins which support this habitat are at most 1 m wide from the adjacent woodlands. The proposal is for the footpath and cycle path network to sit within the modified grassland component of the site, retaining the other neutral grassland verges that exist on site. As such, no direct or indirect impacts are anticipated.

This habitat, if the proposed management techniques are followed, is likely to develop within the large blocks of existing modified grassland within the grassland components G4 & G5, directly adjacent to this habitat, as the modified grassland slowly transitions towards 'other neutral grassland' habitat combined with the development of scrub.

Lolium-Cynosurus neutral grassland g3c6

A relatively small area of this habitat (approx. 0.89 ha) of this grassland type is present within the site within grassland parcel G7. This habitat will not be subject to the management techniques that are proposed for grassland parcels G4 & G5, but will be subject to annual mechanical cutting. As such, this habitat type will likely remain as g3c6 for the foreseeable future and no habitat impacts are anticipated bar the loss of a 2m wide section for the proposed footpath.

The loss relating to the footprint of the proposed cycle-path is to be off-set by the by the creation of high-value habitat within grassland parcels G4 & G5.

5.3.2 Hedgerows

Native Hedgerow h2a6

It is understood that only very small section of native hedgerow will be lost directly as a result of the proposed works (located at and at TQ 29741 25729) in order to make way for a proposed new bicycle access into the site from Stapleford Road. Impacts to the root protection areas of an adjacent (offsite – at TQ 29743 25725) beech *Fagus sylvatica* tree are possible, but are understood to be detailed in the accompanying arboricultural report. The only minor impact is relating to hedgerow fragmentation. The proposed gap to make way for the cycle path is understood to be small in scale (2 m wide for the cycle path). As such, the impact is considered to be minor at the site level only.

In the absence of mitigation, the proposed impacts are negligible in scale. The proposed creation of a substantial area of the similar habitat of woody scrub within grassland parcels G4 & G5 is likely to result in a major positive overall at a parish level.

Species-rich native hedgerow with trees h2a5

These hedgerows are located to the south of grassland parcel G1, to the south and east of grassland parcel G2 and to the south and east of grassland parcel G3. These hedgerows are all of relatively recent origin. Apart from the unmanaged shrub species,

it supports a series of semi-mature trees. Species composition is of hazel (dominant) with goat willow *Salix caprea*, sycamore, blackthorn, dog rose, field maple *Acer campestre*, hawthorn, dog rose, field elm, rowan *Sorbus aucuparia*, bramble, grey willow *Salix cinerea*, elder *Sambucus nigra*, ash (with ADB), spindle *Euonymus europaeus*, guelder rose *Viburnum opulus* and holly *Ilex aquifolium*.

Impacts will be limited to the proposed new pedestrian pathways allowing access from the north of the site towards the south. Impacts to this habitat will be confined to a new access being made at TQ 29479 25646 for this purpose.

In the absence of mitigation, the proposed impacts are negligible in scale. The proposed creation of a substantial area of the similar habitat of woody scrub within grassland parcels G4 & G5 is likely to result in a major positive overall at a parish level.

It is understood that the retained hedgerows/ hedgerows with trees will be protected during the footpath construction period and managed in accordance with any Arboricultural Protection Plan undertaken for the site. The ash component of these hedgerows should also be monitored from a health & safety perspective.

5.3.3 Ponds

Ponds r1

A series of ponds (the two carp fishing ponds and ponds 1, 2 & 4) are located within the site.

The carp ponds are to be electro-fished out and the carp relocated to another sport fishery. This will be undertaken with the aim of restoring these two ponds which have been negatively impacted through the introduction of carp, which predate heavily on native invertebrate and amphibians and currently cause considerable water pollution impacts through the outflow to the south of the ponds into the nearby watercourse.

The removal of this fish from the carp ponds is considered to result in a large-scale positive impact event that will likely completely alter the existing community dynamics and restore and reset the aquatic habitat to a far more favourable condition in the medium to long term by making the ponds available to wildlife species. No negative impacts from this proposed activity have been identified.

In terms of the construction of the new foot/cycle path network, there is a very small risk of impacts to the two ponds, adjacent outflow channel and other connected or nearby watercourse, for example through accidental discharge of fuels/oils from plant utilised for the construction phase of the proposed development.

It is understood that strict pollution prevention measures, covering pre-works enabling works and during and post completion of works, must be employed during the course of the proposed footpath construction works.

In terms of wildlife conservation and habitat restoration, the removal of carp from these two ponds will positively affect the existing community dynamics to restore and reset the habitat to a far more favourable condition in the medium to long term, as already mentioned. This is considered to be a positive impact at the parish level.

No negative impacts other than the risk associated with the use/storage of plant in close proximity to these two ponds is anticipated, but with the mitigation taken into account, no further impacts are anticipated.

Ponds 1 & 2

These two ponds were likely created for the purpose of watering stock. It is proposed that both of these ponds have their stock fencing removed and a proportion of the scrub and semi-mature trees removed. Both ponds will then be subject to restoration by digging out the ponds down to their clay liners in order to restore the pond depth in order to improve their biodiversity value.

Pond 1 supports least duckweed, a Schedule 9 invasive species. It is an illegal act to allow this species to spread in the wild and precautions must be taken to ensure that this is not the case. This plant *must* be treated and exterminated from the waterbody prior to works commencing.

Neither of these ponds support great crested newt, but smooth newt has been recorded within both Ponds 1 & 2.

Least duckweed must be eliminated from the two ponds by professional contractors to ensure that they do not re-enter the restored ponds post completion of works.

Precautions must be taken to ensure that individual amphibians are not killed through a hand search by a suitably experienced ecologist during the restoration/excavation stage. Individuals should then be transported and placed inside the reptile hibernacula being constructed on site.

There is potential for indirect impacts such as air pollution and water pollution to cause adverse impacts during the pond restoration proposed to Ponds 1 & 4.

A Construction and Environmental Management Plan (CEMP) will be required to avoid any impacts of the proposed works.

In the absence of mitigation, possible pollution impacts have the potential to cause parish wide impacts to the ponds and the wider river catchment.

Overall, the restoration of these two ponds will have a significant positive impact on their conservation value, creating deeper and more open ponds with a restored botanical interest and value to wildlife, including a variety of botanical, amphibian and invertebrate species. With mitigation in place, the restoration of these ponds have the potential to create a large scale positive for a range of wildlife species at a parish level.

Pond 3 & 4

Pond 3 is comprised of a former historic quarry that partially fills with water during the winter period. As such it is not considered a waterbody and does not support an aquatic flora. As such it is not considered further in this report.

Pond 4 is located within the woodland located to the north of the site. This pond is to remain non-interventionalist and will not be restored as with ponds 1 & 2.

Neither of these ponds are to be impacted by the proposed restoration works, and as such no impacts are anticipated. This includes the ephemeral seasonal waterbody located in close proximity to the coarse fishing ponds.

5.3.4 Watercourse

Other Rivers and Streams r2b.

No direct works are proposed to the watercourse that runs along the River Adur, which runs close to the southern site boundary.

There is a small risk of impacts to the watercourse through accidental discharge of fuels/oils from plant utilised for the construction of the footpath network/pond restoration. It is understood that strict pollution prevention measures, covering pre-works enabling works and during and post completion of works, must be employed during the course of the proposed works.

The proposed footpath that runs along the southern site boundary will head over the existing piped section of the River Adur withing an area of grassland and no further bridge or other access infrastructure is required. As such, no other direct or indirect impacts from the construction of the footpath network are anticipated.

There are large positive impacts from the electrofishing and pond restoration of the carp ponds, located a short distance to the north of the site. Currently these ponds drain into the River Adur through the connected outflow channel causing widespread siltation and nitrate impacts. As such, the removal of the carp from these ponds and the creation of valuable ponds utilised for nature conservation will have a positive impact on the water quality of the River Adur.

A Construction and Environmental Management Plan (CEMP) will be required to avoid any impacts of the proposed works.

In the absence of mitigation, possible pollution impacts have the potential to cause parish wide impacts to the wider river catchment.

With mitigation in place the proposed works will have a large-scale positive impact to the River Adur through the removal of the main source of pollution from the carp ponds within this river section.

5.3.5 Woodland

Lowland Mixed Deciduous Woodland w1f

Part of this habitat is also designated as Semi-Natural Ancient Woodland, located to the west of the site. While sections of the semi-natural ancient woodland support the traditional understorey of coppice with maiden canopy trees, a large proportion of the designated area supports large stands of the invasive plant species *Rhododendron ponticum*, a Schedule 9 listed species. This species dominated the understorey in

certain areas, while the maiden trees have been felled and removed. This invasive species must be slowly removed over a 10-20 year period through repeat cutting the treating of stems and the area allowed to regenerate with native tree / shrub species through natural succession.

A proportion of this habitat will be subject to the introduction of small numbers of stock with cattle and pigs being allowed to access the non-fenced area. This will create an amount of bioturbation through the actions of rooting pigs and cattle poaching in some areas. Due to the limited stock numbers anticipated, the impact of this overall.

Due to the limited stock numbers anticipated, the impact of the introduction of stock is considered to be a positive overall, with cattle in particular being thought to provide biodiversity benefits in woodlands when grazed at low density since they eat dense vegetation of a low digestibility and break up vegetation mats with their hooves. This then opens up the ground layer vegetation and is thought to be beneficial for tree regeneration as well as leading to a greater variety of vegetation types and associated invertebrate and bird assemblages.

The potential impact area is considered to be in relation to the construction of the proposed cycle path (and associated stock fencing) which runs through this habitat, albeit, on an already existing overgrown trackway of some antiquity. This lowland mixed deciduous woodland may be impacted by the construction of the proposed footpath through limited fragmentation effects on the woodland component of the site through the installation of the proposed stock fencing.

Impacts will be restricted to the direct impacts relating to the proposed cycle path. It is understood that the design of this footpath will be in line with the Sustrans guidance ([design guide](#)).

Due to the soft and unstable nature, and the proximity of nearby trees to the existing 'path' in this location, the use of geogrids and geotextiles may enable a shallower foundation to be considered. Advice should be sought from an appropriately qualified person when specifying such systems. Due to the proximity of the proposed path in relation to retained (SNAW) woodland habitat, the use of a bituminous surface is to be avoided due to hydrocarbon runoff. Designers are encouraged to explore the most suitable path surfaces to suit the route as the introduction could be considered to 'urbanise' natural environments. To alleviate these concerns, designers can specify

alternative surface course materials such as an unsealed surface, such as compacted/crushed or graded rock/stone.

Overall, the wider measures are anticipated to have a positive impact on biodiversity through the eradication of the invasive plant species *Rhododendron ponticum* and the impact on the non-deterministic approach to habitat and species restoration termed “constrained rewilding”. In this approach the stock fencing is essential to keep people safe from stock and to constrain the stock within the site.

In the absence of mitigation, the impact of the proposed cycle path within the woodlands is considered by be negative at a parish level. With the proposed design taken into account, utilising the correct substrate, the impact of the proposed cycle path is likely to be a minor negative at the site level.

Other Broadleaved Woodland w1g

The areas of this habitat located to the east and north of the site will be in close proximity to a new footpath will run around the edge of this habitat. It is proposed that root protection areas (RPA's) of the boundary trees/shrubs are taken into account when positioning this pathway as set out in the arboricultural reports.

A large section of this habitat will be subject to the introduction of small numbers of stock, with cattle and pigs being allowed to access the non-fenced areas. This will create an amount of bioturbation through the actions of rooting pigs and cattle poaching in some areas. Due to the limited stock numbers anticipated, the impact of the introduction of stock is considered to be a positive overall, with cattle in particular being thought to provide biodiversity benefits in woodlands when grazed at low density since they eat dense vegetation of a low digestibility and break up vegetation mats with their hooves. This opens up the ground layer vegetation and is thought to be beneficial for tree regeneration as well as leading to a greater variety of vegetation types and associated invertebrate and bird assemblages.

The plantation woodland, located to the west of the site is to have a new cycle path, as well as a series of rides and glades cut into it. In addition to this, the poplar trees are to be targeted for veteranisation and felling. The woodland already has a series of rides within it and it is proposed to utilise these up in order to create space for the proposed cycle path. Th eastern side of this cycle path will also be fenced to prevent stock from accessing the far western side of the site.

The veteranisation of the poplar tree component of the woodland is proposed. This will create a large number of features suitable for nesting birds, roosting bats and, over time saproxylic invertebrate species, such as stag beetle species. This will create a large gain for biodiversity within an even-aged woodland which currently lacks any features that have the potential to support these species.

A proportion of this woodland habitat, located to the north of the grassland parcel G4 is currently used for the raising of pheasants for game shooting. This species is known to heavily predate reptile numbers. The removal of this activity/large numbers of this game bird from the site is considered to be a positive in terms of biodiversity.

The remainder of this this habitat located to the west of the site are is to remain unimpacted by the proposed development and as such no impacts are anticipated in these areas.

The potential impact area is considered to be in relation to the construction of the proposed cycle path (and associated stock fencing) which runs through this habitat, albeit, along existing rides. This woodland may be impacted by the construction of the proposed footpath through limited fragmentation effects on the woodland component of the site through the installation of the proposed stock fencing.

Impacts will be restricted to the direct impacts relating to the proposed cycle path. It is understood that the design of this footpath will be in line with the Sustrans guidance ([design guide](#)).

Due to the proximity of nearby trees to the existing 'path' in this location, the use of geogrids and geotextiles may enable a shallower foundation should be considered. Advice should be sought from an appropriately qualified person when specifying such systems. The use of a bituminous surface is to be avoided due to hydrocarbon runoff.

Designers are encouraged to explore the most suitable path surfaces to suit the route as the introduction could be considered to 'urbanise' natural environments. To alleviate these concerns, designers can specify alternative surface course materials such as an unsealed surface, such as compacted / crushed or graded rock / stone.

Overall, the wider measures undertaken within the site are anticipated to have a positive impact on biodiversity through the non-deterministic approach to habitat and species restoration termed “constrained rewilding”. In this approach the stock fencing is essential to keep people safe from stock and to constrain the stock within the site.

In the absence of mitigation, the impact of the proposed cycle path within the woodland is considered by be negative at a site level. With the proposed design taken into account, utilising the correct substrate, the impact of the proposed cycle path is likely to be a minor negative at the site level.

5.3.6 Other Habitats

Dense Bracken g1c

No areas of dense bracken are to be impacted by the proposed restoration works, and as such no impacts are anticipated.

The impact of the non-deterministic approach to habitat and species restoration termed “constrained rewilding”. This will likely allow the spread of this habitat into the existing modified grassland overtime, creating a more structured habitat for a variety of wildlife species.

Dense Scrub h3

No areas of scrub are to be impacted by the proposed restoration works, and as such no impacts are anticipated.

The impact of the non-deterministic approach to habitat and species restoration termed “constrained rewilding”, will likely allow the spread of this habitat into the existing modified grassland overtime, creating a more structured habitat for a variety of wildlife species. It is expected that after 10 years there will be a large increase in this habitat due to the actions of reduced overall grazing combined with the actions of the pigs breaking up the sward of the modified grassland sward within parcels G4 & G5. The development of this habitat is key to restoring populations of bird in particular and will support a wide range of amphibian, reptile, bat and invertebrate species over time.

Developed Land, Sealed Surface u1b

No areas of ephemeral perennial are to be impacted by the proposed restoration works, and as such no impacts are anticipated.

Artificial Unvegetated Unsealed Surface u1c

No areas of ephemeral perennial are to be impacted by the proposed restoration works, and as such no impacts are anticipated.

5.3.7 Non-Native Botanical Species

Rhododendron ponticum and least duckweed, listed as a non-native invasive botanical species on Schedule 9 of the Wildlife and Countryside Act 1981 (as amended), were both recorded on site along with the non-native invasive winter heliotrope.

It will be required that these species are not caused to spread by the proposed works and is appropriately removed or eradicated from the site by a professional prior to or at the commencement of any development works.

The eradication of these species in the absence of appropriate mitigation will likely result in the spread of these species to other areas of habitat both on and adjacent to the site. This is considered to constitute a negative impact at a parish level.

With appropriate mitigation in place, the removal and eradication of these species is considered to have a positive impact at site level.

5.4 Fauna

5.4.1 Amphibians

Great crested newt was confirmed as present on site from the 2023 eDNA surveys. They were recorded within a single seasonal ephemeral waterbody located on site. This seasonal waterbody is to remain unimpacted by the proposed works. Common and widespread amphibian species are also present, including common frog, common toad and smooth newt.

Great crested newt and other amphibians are likely located within the suitable terrestrial habitat located on site.

Great crested newt is afforded protection under the UK Wildlife and Countryside Act 1981 (as amended) in Schedule 5, and the EC Habitats and Species Directive (92/43/EC), enacted in the UK by the Conservation of Habitats and Species Regulations 2010.

This level of protection makes it illegal to:

- Deliberately capture, kill or injure great crested newt/s; and,
- Damage or destroy a breeding site or resting place (including aquatic and terrestrial habitat whilst great crested newts are or are not present at the time).

Mitigation measures will be required in order to avoid the disturbance or killing and injury to this species, this is likely to comprise the retention and future management of terrestrial habitat within the site and within adjacent suitable habitat.

The construction of the footpath and cycle path network have the potential to impact these species during their terrestrial phases. Appropriate mitigation, in the form of habitat manipulation of the grassland habitats to be impacted, should be undertaken in order to encourage the movement of these species away from the proposed working areas.

Removal of a small proportion (of the modified grassland) habitat for the creation of the footpath and cycle path infrastructure must be conducted during the active season from mid-September – end October under a Method Statement and supervision of a suitably trained Ecologist. Any animals found should be carefully moved to nearby places of safety such as the proposed hibernacula to be constructed on site.

In the absence of mitigation, the removal of this habitat is considered to have a minor negative impact on amphibian species on a parish level.

With the proposed mitigation in place, the removal of relatively small areas of modified grassland to make way for the proposed foot/cycle path network is considered to be a neutral impact when taken in conjunction with the wider habitat restoration works proposed.

5.4.2 Badgers

The proposed installation of a network of foot and cycle paths, glade creation, poplar veteranisation, pond restoration and construction of viewing tower is only likely to indirectly impact any badger social group that may use the field for foraging purposes.

Badgers are protected by the Protection of Badgers Act 1992 and the Wildlife and Countryside Act 1981 (as amended), Schedule 6. Under the Wildlife and Countryside Act it is illegal to intentionally kill, capture, injure or ill-treat any badger. Under the

Protection of Badgers Act it is an offence to obstruct, destroy or damage a badger sett or to disturb badgers within a sett, with any works which will contravene this legislation requiring prior licensing from Natural England.

There is a risk of an offence being committed under the Protection of Badgers Act 1992 if an outlier sett of recent origin, located at TQ 29597 24339, in close proximity to the proposed footpath, is disturbed during construction. Therefore, to mitigate this risk, a 10m fenced off buffer zone around this sett entrance is recommended, in which no construction activities may occur. No works or vehicle access will occur within 10 m of the retained outlier sett. If 10 m boundary is breached, this may cause an offence under the Protection of Badgers Act 1992. If this cannot be achieved, the sett can be closed under licence from Natural England.

Other than this, impacts will be confined to the loss of foraging areas and the possible hinderance of traditional commuting routes, although it is considered that badgers are able to easily dig under stock fencing.

This will be mitigated for by the creation of large areas of high value habitat in the form of species-rich grassland with associated scrub and restored ponds providing a wide range of new habitat for prey animals which make up a significant proportion of badger diet, namely common frog and toad, which have been found to constitute up to 30 % of the diet (in terms of weight of overall food consumed) over a year in some badger social groups (*Roper & Mickevicius, 1995*). As such, the creation of a large area of species-diverse grassland and restored ponds is likely to enhance the foraging opportunities for this species over time.

In the absence of mitigation, the impact to badger may lead to death/injury or the destruction of a single entrance outlier sett. This is considered to be a negative impact at a site level.

With suitable mitigation/avoidance in place. The creation of a large area of vastly improved foraging grounds is likely to be a positive impact at a parish level.

5.4.3 Bats

Roosting bats - trees

A number of trees located within the site support features with moderate or high bat roosting potential. None of these trees are to be impacted in any way by the proposed works and no artificial lighting is proposed as part of the development. As such no impacts are therefore considered likely.

The installation of a six, tree mounted maternity and hibernation boxes/towers and the veteranisation of the poplar component of the lowland mixed deciduous woodland located to the west of the site will greatly enhance the roosting potential for a wide range of bat species and create hibernation potential within the site which is likely lacking due to the even aged and relatively young structure of the majority of the woodland on site.

The proposed habitat creation/box installation is considered to be a positive for roosting bats at a parish level, by providing a resource that is largely lacking from the site.

Roosting bats – building

The building and eight mature trees on site is considered likely to support roosting bats. No impacts to this building or trees are proposed. As such no impacts to roosting bats are anticipated.

Commuting & foraging

In terms of commuting, the proposed development and restoration works will result in no identifiable impacts. No artificial lighting is proposed and therefore no impacts are anticipated.

The creation of a larger area of suitable foraging habitat in the form of the creation of large areas of high value habitat in the form of species-rich grassland with associated scrub, a series of new woodland rides and glades and restored ponds providing a wide range of new habitat for prey animals, will enhance the site for foraging bat species over time through the supplying of a large volume of invertebrate species and numbers within the area. The restoration of the ponds (1 & 2 and the carp ponds) will also restore a large area of habitat that will then have the potential to support, through improved water quality, larger amounts of invertebrate species that bats feed on. These

proposed restoration works will enhance the site for bat species in general (see Appendix 5). The proposed works are considered to be a positive for foraging & commuting bats at a parish level.

5.4.4 Birds

Breeding Birds

The hedgerows, woodlands (including woodland edge habitats), scrub and grassland were identified as being of value to breeding birds. The impacts on nesting birds will be confined to the loss of two small sections of hedgerow to make way for site access and a small number of individual trees to make way for the proposed cycle route through the woodland to the west of the site within the lowland mixed deciduous woodland. This is considered to represent a minor negative in the absence of mitigation.

The installation of a number of tree mounted bird boxes and the veteranisation of the poplar component of the lowland mixed deciduous woodland located to the west of the site will greatly enhance the nesting potential for a wide range of bird species and create a greatly increased nesting potential within the site which is likely lacking due to the even aged and relatively young structure of the majority of the woodland on site.

The creation of a larger area of suitable foraging habitat in the form of the creation of large areas of high value habitat in the form of species-rich grassland with associated scrub, a series of new woodland rides and glades and restored ponds providing a wide range of new nesting and foraging habitat for bird species and will enhance the site for foraging bird species over time through the supplying of a large volume of invertebrate species and numbers within the area. The restoration of the ponds (1 & 2 and the carp ponds) will also restore a large area of habitat that will then have the potential to support, through improved water quality, larger amounts of invertebrate species that bird species feed on. These proposed restoration works will enhance the site for birds species in general.

In particular, certain rare, declining and scarce species should be monitored as indicators of habitat restoration success, such as nightingale *Luscinia megarhynchos*, cuckoo *Cuculus canorus*, skylark *Alauda arvensis*, barn owl *Tyto abla* and turtle dove *Streptopelia turtur*.

With these measures taken into account, these measures will result in a major positive impact for nesting birds (both open ground and woodland/shrub nesting species) at a parish level.

5.4.5 Dormouse

Dormouse was recorded on site during the survey, and are well recorded within the locality. The habitats with the potential to support dormice within the site as a whole are the semi-natural woodland habitats together with the scrub and hedgerow habitats.

The impacts on nesting dormouse will be confined to the loss of two small sections of hedgerow to make way for site access for the proposed cycle route through the lowland mixed deciduous woodland located to the west of the site. The loss of the two hedgerow sections is considered to be minor and under 10 m loss in total. This is not considered enough to trigger any specific mitigation in terms of licencing or specific precautionary approach in terms of dormouse. The proposed cycle path located to the west of the site within the plantation woodland is understood to only involve the removal of a very small number of immature/semi-mature mixed plantation trees in total due to the presence of the existing ride that runs through the area.

The hedgerows, woodlands and scrub were identified as being of value to dormouse.

The proposed development is considered to represent an initial negligible/minor negative in the absence of mitigation at a site level.

The veteranisation of the poplar component of the lowland mixed deciduous woodland located to the west of the site will greatly enhance the nesting potential for dormouse and create a greatly increased nesting potential within the site which is likely lacking due to the even aged and relatively young structure of the majority of the woodland on site.

The creation of a larger area of suitable foraging habitat in the form of the creation of large areas of high value habitat in the form of species-rich grassland with associated scrub will provide a wide range of new nesting and foraging habitat for dormouse and will enhance the site for dormouse over time through the supplying of a large volume of direct suitable habitat and, fruit, nuts and invertebrate species within the site. These proposed restoration works will enhance the site for dormouse in general.

Overall, there is considered to be a major positive for dormouse at a parish level from the proposed works.

5.4.6 Invertebrates

Terrestrial Invertebrates

Given the retention of the vast majority of the suitable habitats combined with the limited overall impacts (confined to the path network creation and viewing platform), on suitable habitats for invertebrate species returned within the desk study, no specific mitigation or compensation is considered necessary. The restoration of the habitats within the site is likely to enhance the value of the site for invertebrates, and could provide habitat for the County Notable species such as Jersey tiger *Euplagia quadripunctaria* and dingy skipper *Erynnis tages* in future.

Aquatic Invertebrates

A total of 33 species were recorded during the survey of three of the ponds on site. Ponds 1 and 4, are heavily shaded and in the advanced stages of succession, with shallow water and limited meso-habitat diversity which in turn has limited the floral and faunal communities. Pond 1, in particular, is completely shaded and of little interest. Pond 2 is more open but is still lacking in floral diversity, although the invertebrate community, whilst somewhat restricted was still of sufficient diversity to be classified as being of 'good' ecological status by PSYM.

Shaded ponds, especially in ancient woodlands can support communities limited in diversity but which can potentially include uncommon species that are specialists of this type of habitat, such as the diving beetle *Hydroporus incognitus* (Kirby, 1992).

Unfortunately, this is not the case at Beechy Bottom Parkland Reserve, where the shading of the ponds has occurred recently as the result of fencing and the growth of relatively young trees and shrubs. Shading by the bankside trees has also resulted in the rapid accumulation of leaf litter and woody debris in the basins.

As part of the planned restoration, the removal of vegetation from, as a minimum, their southern sides should be undertaken. Dredging can be an expensive and drastic procedure but in the case of ponds 1 and 4 is likely to be required for any meaningful restoration.

Grading the pond margins to provide shallow sloping or shelved profiles will encourage the development of communities of marginal and wetland vegetation. Most aquatic invertebrate species tend to live amongst dense stands of submerged plants or marginal vegetation, often in water as little as 10cm deep, with floating mats of grasses such as *Agrostis* and especially floating sweet-grass *Glyceria fluitans* being of particular value, especially for beetles.

The removal of fencing to provide livestock access will greatly improve marginal diversity for plants, encouraging the growth of smaller early-successional species that are later out-competed by taller, faster-growing species; improved floral diversity has a concomitant positive outcome for invertebrates. Light poaching can produce small pools that many *hydrophilid* beetle species utilise or areas of bare mud used by certain dragonfly species for egg-laying. However, note that excessive poaching can cause turbidity of the water, the collapse of banks and the opposite effect, curtailing the growth of marginal plants, thus stock density, which is designed to be very low, is of importance. Monitoring of impacts as stock numbers fluctuate is recommended.

In the absence of mitigation, the impact of the proposed works on inveterate species is considered to be negligible overall.

The restoration of these two ponds, in combination with the electrofishing and stock removal from the carp ponds, will support a wide range of freshwater invertebrate species. The impact of the proposed works, although large in scale to the two ponds in the short-term, will likely result in no species losses in the medium to long-term as invertebrate species are well known to reproduce rapidly and with the species recorded will likely all be retained within the locality, they are considered as likely to re-colonise the newly restored and enhanced ponds post-completion of works.

The proposed works are considered to constitute a major positive impact for inveterate species at a parish level.

5.4.7 Reptiles

The construction of the footpath and cycle path network have the potential to impact these species during their terrestrial phases.

All reptiles are protected under the W&CA 1981 (as amended) and there is a risk of injury and mortality to slow worm, grass snake and adder during the grassland removal

of the existing habitat within the proposed area to be occupied by the Serpentine Lake, if unmitigated.

The modified habitats to be impacted must be subject to habitat manipulation in order to encourage the movement of these species away from the proposed working areas. Removal of the grassland habitat for the creation of the footpath and cycle path infrastructure must be conducted during the active season from mid-September – end October under a Method Statement and supervision of a suitably trained Ecologist.

The creation of large areas of species-diverse grassland supporting a wide range of invertebrate prey, interspersed with woody scrub creating a series of micro-habitats which can be used for basking and foraging, commuting and hibernation enhance the site for reptile species over the medium to long term.

The site also supported a moderate population barred grass snake. This species is particularly fond of wetland habitats but can also be found in dry grasslands. Grass snake hunt amphibians, fish, small mammals and birds.

The proposed works will restore the pond habitat present on site, therefore, creating opportunities for foraging reptiles. Both dispersal and hibernation will be maintained and enhanced through the creation of a series of reptile hibernacula. Long-term positive impacts to the local population are considered likely.

The construction of the footpath and cycle path network have the potential to impact reptile species. Appropriate mitigation, in the form of habitat manipulation of the grassland habitats to be impacted, should be undertaken in order to encourage the movement of reptile species away from the proposed working areas.

Removal of a small proportion (of the modified grassland) habitat for the creation of the footpath and cycle path infrastructure must be conducted during the reptile active season from mid-September – end October under a Method Statement and supervision of a suitably trained Ecologist. Any animals found should be carefully moved to nearby places of safety such as the proposed hibernacula to be constructed on site.

In the absence of mitigation, the removal of this habitat is considered to have a negative impact on reptile species on a site level.

With the proposed mitigation in place, the removal of relatively small areas of modified grassland to make way for the proposed foot/cycle path network is considered to be a neutral impact when taken in conjunction with the wider habitat restoration works proposed.

5.4.8 Otter

Otter utilise the site throughout the year, but are not confirmed as not breeding within the site. As such, no specific mitigation or compensation is required.

No records for otter were returned within 1 km of the site by the data search. However, otter are considered to be within the locality and have been recorded just over 2km away within the same river catchment. The existing carp ponds on site are also considered likely to be a draw for this species.

Otter is protected by as a European protected species (EPS). EPS are protected under the Conservation of Habitats and Species Regulations 2017. It is an offence to deliberately kill, injure, disturb or capture them, damage or destroy their breeding sites and resting places - even if otters are not present.

It is also an offence under the Wildlife and Countryside Act 1981 (as amended) to intentionally or recklessly disturb otters while they occupy a structure or place used for shelter or protection, or obstruct access to a place of shelter or protection.

It is considered likely that the River Adur section on site is utilised by otter when foraging or dispersing.

There is a very small risk of impacts to the River Adur via the adjacent outflow channel from the carp pond, for example through accidental discharge of fuels/oils from plant utilised for the construction of the footpath network/ pond restoration. It is understood that strict pollution prevention measures, covering pre-works enabling works and during and post completion of works, must be employed during the course of the proposed construction works.

In the absence of mitigation, the impacts have the potential to be negative at a parish level.

With suitable mitigation in place, the impacts to this species are considered to be positive at a site level through the restriction of the existing water pollution impacts from the adjacent carp ponds.

5.4.9 Water Vole

No records for water vole were returned within 1 km of the site by the data search.

The results of the water vole survey did not find any evidence of water voles within the proposed development site nor in association with the watercourse (River Adur) within the site.

The field survey identified the habitat to be of negligible value for water vole along the river corridor. Within the site, there was poor habitat suitability for water vole with negative indicators such as unsuitable surrounding habitat and run-off and eutrophication from the carp ponds.

As such, the species is considered to be absent from the site.

Through the removal of the carp from their existing fishing ponds. The suitability of the section of the River Adur within the site to water vole, could be improved from 'poor' to 'good' habitat suitability for water vole and may be of use to this species if they return to the area.

5.4.10 Hedgehog

Habitat of value to hedgehog is being retained and the creation of a large area of species-diverse grassland interspersed with scrub will provide greatly enhanced foraging opportunities. Therefore, creating opportunities for foraging commuting and hibernating, hedgehog habitat will be maintained and enhanced in the medium term. Long-term adverse impacts to the local population are considered to be positive overall.

6.1 Recommendations for Avoidance/Mitigation of Ecological Impacts

6.1.1 Ecology Mitigation, Compensation & Enhancement Strategy

Development of the site will require that an Construction Ecological Management Plan is implemented for development, including for:

- Amphibians (including great crested newt);
- Bat species;
- Badger;
- Nesting birds; and,
- Reptiles – including habitat manipulation.

6.1.2 Protection of River Adur

There is potential for indirect impacts such as air pollution and water pollution to cause adverse impacts during the pond restoration proposed to Ponds 1 & 4 as well as the electrofishing operation and restoration of the existing Carp Ponds, particularly given the connection of the watercourse located to the south of the site via the existing outflow channel. Two of these ponds (Ponds 1 & 4) also support the aquatic invasive plant least duckweed. Efforts should be made to eliminate this species from the two ponds to ensure that they do not re-enter the restored ponds.

A buffer of at least two metres between the outflow channel of the carp ponds, the ponds themselves and the area of plant storage or fuels is to take place. The buffer is to be demarcated by fencing or other means to ensure protection of the watercourse.

This measure will also protect the retained habitat for species including foraging birds, otter, fish, invertebrates, amphibians and reptiles.

6.1.3 Vegetation Management

Any areas where construction is to take place (including the proposed path network, storage of materials or welfare facilities) it to be maintained with a short sward prior to construction taking place. This is to encourage any reptiles/amphibians present to move away from the working areas.

6.1.4 Nesting Birds

Ideally, the pathway construction and small sections of hedgerow removal to make way for the path/cycle path network are to take place outside the nesting bird season (considered to be March-August inclusive, although depending on species, geographical area and weather conditions nesting can take place outside of these times) to avoid unnecessary delays caused by nesting birds. If this is not possible, a nesting bird check is to be carried out and if an active nest is found then works within a 10 m buffer should cease until the nest is no longer active (i.e. the last chick has fledged).

6.1.5 Site Excavations

As a precautionary measure during the construction works, any excavations which are to remain open overnight, are to be fenced or covered to prevent potential entrapment and or injury of species such as badger or hedgehog.

6.1.6 Removal of Non-native Invasive Plant Species

Rhododendron ponticum and least duckweed, listed as a non-native invasive botanical species on Schedule 9 of the Wildlife and Countryside Act 1981 (as amended), were both recorded on site along with the non-native invasive winter heliotrope.

Care must be taken that operations during the construction period, such as digging, do not cause the inadvertent spread of these species.

6.2 Compliance Monitoring

The development should include a pre-commencement site meeting and subsequent compliance monitoring visits, undertaken and recorded by a suitably qualified and pre-appointed ecologist. Such visits would be required to confirm adherence to recommendations/constraints and implementation of ecological mitigation and enhancement recommendations.

6.3 Ecology Compensation & Enhancement Measures

The National Planning Policy Framework (NPPF) outlines the Government's commitment to minimise impacts on biodiversity and provide 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.

The required enhancements will include:

- The conversion, through careful management, of the two modified grassland blocks (G4 & G5) into species-diverse grassland interspersed with woody scrub and dense bracken patches will create a habitat of enhanced value to a wide range of mammal, plant, invertebrate, amphibian and bird species;
- The restoration of the Ponds 1, 4 and the carp ponds, will restore the pond habitat present on site, therefore, creating opportunities for to a wide range of mammal, invertebrate, amphibian, plant and bird species;
- The planting of 60 standard trees (adequately stock protected) throughout the parkland in order, over time, to re-create the woodland pasture habitat that formerly existed on site;
- The veteranisation of the poplar trees over time within the Oter Woodland Broadleaved (w1g) located to the west of the site by targeting low-value / undesirable trees in order to create instant habitat of high value to roosting bats and nesting dormouse/bird species through the creation of standing deadwood with a series of specially designed features carving into them specifically designed for different species (different bat species prefer different roosting positions, and bird species such as treecreeper prefer bark flakes, nest boxes for general bird species and woodpecker holes). Features low down on tree trunks can also be created specifically to support dormouse and other small mammal species. Branches removed from the tree canopies in order to create a more stable trunk will be deposited on the woodland floor to create deadwood accumulations of significant interest to saproxylic invertebrate species and fungi;
- New hedgerows along the inside of the proposed footpath and cycle network will provide enhanced connectivity with surrounding habitats, additional nesting opportunities for breeding birds, additional commuting and foraging habitat for bats and dormouse, as well as additional foraging opportunities for badgers and hedgehog. This hedgerow will also provide a range of opportunities for invertebrate species. This hedgerow should be planted with at least five native woody species. For example: hawthorn, dog rose, hazel, oak and field maple. The hedgerow should be allowed to develop into a dense but short and tightly manged structure approximately 1 m tall and 1.5 m wide to allow the visual viewing of the wider landscape for members of the public;
- Newly restored Ponds 1 & 2 as well as the carp ponds will create a wide range of high-quality habitat for nesting and foraging birds including aquatic plants,

waterfowl, foraging bats, invertebrates, aquatic plants, fish, reptiles, badger, hedgehog and riparian mammals;

- Roosting opportunities should be provided for bats, comprising six maternity and hibernation capable tree mounted bat boxes in suitable locations throughout the site;
- New nesting opportunities for birds should be provided, for example the installation of 20 tree mounted bird boxes within suitable locations along the eastern edge of the Semi-Natural Ancient Woodland; and,
- The construction of a series of reptile hibernacula within the site will enhance the site for reptile species and provide hibernation, breeding and shelter opportunities to the slow-worm and barred grass snake recorded on site.

The above-required compensation and enhancement measures should be illustrated on landscape plan(s), proposed plans and/or elevation drawings, where appropriate (see Appendix 5).

6.4 Monitoring

The development of the site and proposed restoration works should include a pre-commencement site meeting and subsequent compliance monitoring visits, undertaken and recorded by a suitably qualified and pre-appointed ecologist as set out in a Construction Ecological Management Plan (CEMP), Landscape Ecological Plan (LEMP) and/or the Habitat & Ecological Restoration Management Plan (Tadorna Consulting, 2023). Such visits would be required to confirm adherence to recommendations/constraints and implementation of ecological mitigation and enhancement recommendations.

6.5 Conclusion

In summary, the majority of the site is considered to be of moderate ecological interest. However, some adverse impacts are predicted on reptiles, badger, invertebrates, and amphibians through the construction of the foot and cycle path network.

Avoidance measures have been incorporated into the design and careful timing of works recommended to reduce these impacts and further mitigation and compensation measures will be implemented in order to eliminate any residual impacts.

Provided the avoidance, timing of works, mitigation and compensation measures are carried out, the proposal is considered unlikely to have significant adverse effects on the majority of ecological receptors.

Implementation of the ecology mitigation, compensation and enhancement measures, and the Habitat & Ecological Restoration Management Plan (Tadorna Consulting, 2023) is considered to represent a major gain for biodiversity overall.

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APPENDICES

- Appendix 1: UK Habitats (UKHab) Plan
- Appendix 2: Bat Activity Survey – Manual Transect & Automated Results
- Appendix 3: Dormouse Survey Plan
- Appendix 4: Reptile Survey Plan
- Appendix 5: Enhancement Plan
- Appendix 6: Examples of Bat Roosting Provisions
- Appendix 7: Examples of Bird Nesting Provisions
- Appendix 8: Example of a Habitat Pile

