



LIZARD

Landscape Design and Ecology

ECOLOGICAL IMPACT ASSESSMENT

Land North of Toddington Lane, Littlehampton

On behalf of: HNW Architects LTD

Prepared by	CO
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EXECUTIVE SUMMARY

Lizard Landscape Design and Ecology has been commissioned to undertake an Ecological Impact Assessment of the proposed development of land to the north of Toddington Lane, Littlehampton, (*Grid Reference: TQ 035 042 – hereafter referred to as 'the site'*).

An initial preliminary ecological appraisal (*PEA*) was undertaken on 14th June 2021 to assess the current site conditions. Badger sett monitoring and reptile surveys were recommended and subsequently undertaken between June and November 2021.

The main body of the development site is dominated by hard / bare ground recently colonised with sparse ephemeral / short perennial vegetation, with areas of tall ruderal species and bramble scrub; habitats of value within the site area only. The tree lines to the north of the site are considered to be of local importance and shall be protected from damage or degradation during the development.

Reptile surveys undertaken between August and September 2021 found a good population of slow worm (max. 15 adults), and a limited number of juvenile grass snake. A translocation of reptiles shall be completed to the on-site buffer along the northern boundary to ensure that development proceeds in accordance with The Wildlife and Countryside Act 1981 (as amended).

Badger sett monitoring found a subsidiary badger sett to the northern boundary of the site. A licence shall be sought from Natural England to allow closure of the sett prior to works in this area proceeding. The northern boundary treeline shall be retained to allow its continued use by badgers and other species.

Once avoidance, mitigation and compensation measures have been taken into account, the impacts of the planned development upon biodiversity will be **negligible** with proposed ecological enhancements resulting in a **net gain** and a **long-term positive increase** in biodiversity in line with national planning policy guidance.

1.0 INTRODUCTION

1.1 Lizard Landscape Design and Ecology has been commissioned to undertake an Ecological Impact Assessment of the proposed development of land to the north of Toddington Lane, Littlehampton (*Grid Reference: TQ 035 042 – hereafter referred to as ‘the site’*).

1.2 An initial preliminary ecological appraisal (*PEA*) was undertaken on 14th June 2021 to assess the current site conditions. The following Phase 2 Protected species surveys were recommended and subsequently undertaken between August and November 2021:

- Badger Sett Monitoring;
- Reptile Surveys;

1.3 The field survey data and analysis contained in this report was undertaken and prepared by Catherine O'Reilly (*MCIEEM, Senior Ecologist; Lizard Landscape Design and Ecology*). The report has been reviewed by George Sayer (*MCIEEM, Senior Ecologist;; Lizard Landscape Design and Ecology*).

Site Information

1.4 The survey area covers c. 1.7 Hectares (ha) of dense scrub, ephemeral / short perennial growth and hard / bare ground located just beyond the north-western edge of Littlehampton. The site is bordered by agricultural land and scattered trees to the north and east – with black ditch being situated c. 59 meters (m) north of the proposed development area. The survey area is bounded to the south and west by a parcel of land (Persimmon Homes Phase 1) which comprises 114 occupied dwellings

Surrounding Landscape

- 1.5 The site is located to the northeast of the parish of Littlehampton in a predominantly residential environment. Land to the north is more open, dominated by agricultural land interspersed with mature tree / hedge lines. Directly to the east of the site there is agricultural land and beyond this lies Zuider Zee nurseries, an area dedicated to commercial horticultural production. The southern boundary of the site is bordered by residential properties with the residential area of Toddington located just beyond the railway line c. 366 meters (m) to the south. Most of the surrounding landscape is residential, with the built mass of Littlehampton stretching out c. 4.5 kilometres (km) to the south-east.
- 1.6 There are 2no ponds within 500.0m of the site – located 480m south-east. There are a number of drainage ditches which lead into Black Ditch located to the north of the site.

Development Proposals

- 1.7 It is understood that the proposals include an outline application for up to 71 dwellings.

2.0 SCOPE OF THE SURVEY

- 2.1 The aim of this ecological appraisal survey has been:
- *To identify habitats and protected species present, and any other features of ecological value;*
 - *Identify impacts of the proposed development*
 - *Set out appropriate avoidance, mitigation and compensation measures.*
 - *To provide details of enhancements which will be incorporated into the scheme.*

3.0 METHODOLOGY

3.1 Desk Study

- 3.1.1 The Multi-Agency Geographical Information Centre (*MAGIC*) was consulted for information regarding priority habitats and statutory designated sites within 2.0km of the proposed construction site. The desk study was completed on 13th June 2021.

3.2 Site Visit

- 3.2.1 A preliminary ecological appraisal was undertaken on 14th June 2021, and the site subjected to an ecology survey using guidelines set out in the *Handbook for Phase 1 Habitat Survey – A Technique for Environmental Audit (JNCC, 2003)*. This has resulted in a Site Habitat Plan (*Figure No. 01*) and Species Lists for Habitat Parcels (*Table No. 05*).
- 3.2.2 Habitats within the land were classified and the presence, or potential presence, of certain protected and / or notable species of flora and fauna were identified. This involved identifying features that may be used by protected species, potential foraging areas and other signs of use. Water bodies were recorded wherever possible, within 500m of the proposed development site.
- 3.2.3 The results are summarised and accompanied in large part by photographic evidence contained in *Appendix A – Site Photographs*.

3.3 Preliminary Bat Roost Assessment

- 3.3.1 A Preliminary Bat Roost Assessment was undertaken on 14th June 2021 by an experienced bat surveyor. Assessment involved a ground-level assessment of trees within and adjacent to the proposed construction zone.

3.3.2 Trees were visually identified from the ground, using binoculars where necessary, for features that could be used by bats such as:

- Woodpecker Holes;
- Knot Holes;
- Tear-outs;
- Flush Cuts;
- Double Leaders.

3.3.3 Once features had been assessed the trees were then categorised in accordance with *Table 4.1 of the Bat Conservation Trust's Good Survey Guidelines (2016)*.

Table No. 01 – Categorisation Criteria

Category	Buildings	Trees
Negligible	No suitable features identified.	No suitable features identified.
Low	A structure which could be used opportunistically, however, are not likely to be used on a regular basis / by a large number of bats.	Tree of sufficient size / age to support bat roost features; but with none identified from the ground.
Moderate	A building with features which, could be used regularly by a small number of bats.	Tree with features which, may support a bat roost of low conservation status.
High	A building with features suitable for use by a large number of bats on a regular basis.	A tree with several potential bat roost sites that are suitable for use by a large number of bats.
'Confirmed'	Signs of bats present such as dead or live bats or droppings.	Signs of bats present such as dead or live bats or droppings.

3.4 Reptile Survey

- 3.4.1 30 no. artificial reptile refugia (*roofing felt; 0.50 x 1.0 m²*) were laid out around the site on 16th August 2021 and allowed to settle for 15 days prior to commencement of the survey. Much of the site is hard bare ground with a sparse covering of short ephemeral vegetation; despite offering suitable basking sites, these areas offer no suitable cover for reptiles. c. 1.27 Ha on site was considered suitable reptile habitat; refugia were therefore placed at a density of c.39 per hectare, well above the minimum recommended density (Froglife, 1999). The locations of artificial reptile refugia are detailed within Figure No. 03.
- 3.4.2 07 no. site visits were conducted, where the number, species, age and sex of the reptiles' present were recorded.
- 3.4.3 Surveys were undertaken where possible during recommended times (08:00 - 11:00 and 16:00 - 18:30) with suitable weather conditions for surveying reptiles (*guidelines recommend temperatures 9-18°C with intermittent or hazy sunshine during warm days*). Weather conditions recorded at each survey visit are shown in Table No. 02 below.

Table No. 02 - Details of Weather Conditions during the Reptile Surveys

Survey	Date of Visit	Time	Weather
01	31.08.21	16:00	21°C – Overcast, Dry, Wind F3
02	18.08.21	10:00	17°C – Cloud / sun, Dry, Wind F4
03	07.09.21	09:30	21°C – Clear / Sunny, Dry, Wind F2
04	09.09.21	09:30	18°C – Overcast, Dry, Wind F4
05	13.09.21	16:20	19°C – Light Cloud, Dry, Wind F4
06	21.09.21	09:30	16°C – Light Cloud, Dry, Wind F2
07	27.09.21	16:00	19°C – Clear / Sunny, Dry, Wind F5

3.5 Badger Sett Monitoring

Initial Survey

- 3.5.1 The initial field survey was undertaken on 14th June 2021 whereby the red line boundary of the site, and all land within a 30m radius (where access was available) was surveyed.
- 3.5.2 The survey area was systematically searched for any evidence of badger such as:
- Setts.
 - Latrines.
 - Snuffle Holes.
 - 'Push-unders' through boundary fencing.
 - Hair caught on fencing or sett entrances.
 - Prints left in mud or sand.
 - Mammal tracks.
- 3.5.3 Any evidence was then mapped to allow the status and distribution of badger activity to be assessed. Due to the presence of dense scrub, the site was re-assessed following sensitive scrub clearance completed on the 20th July, with a further area of clearance on the 22nd October 2021.

Sett Monitoring

- 3.5.4 A total of 4no. potential badger holes were monitored on site. All holes were subject to a period of 21 days continuous monitoring each between 02nd September and 03rd December 2021. Setts were monitored using a combination of infrared cameras, as well as hair and print traps.
- 3.5.5 Where found, setts were categorised as follows:
- Main Sett – Large setts with well-worn pathways between entrances. The sett is in continual use by badgers and is used by the dominant breeding female.
 - Annex Sett – Normally located within 150m of the main sett and linked by well-worn pathways. Generally consist of many holes, however it may not be in use all of the time.

- **Subsidiary Sett** – A smaller sett located further from the main sett with no obvious pathways linking to the main sett. The sett is likely to be disused for part of the year.
- **Outlier Sett** – Often a single hole which is used sporadically and may be used by rabbits and foxes when not in use.

3.5.6 Sett entrances were mapped and their usage recorded. Entrances were classified as:

- **Active** – a hole clear of debris, with signs of recent excavation. Bedding balls may be present along with other signs of badger occupation.
- **Partially active** – a hole which shows no recent sign of occupation and may have debris and leaf litter to the entrance.
- **Disused** – a hole which is blocked with debris or collapsed, and which could only be used again with significant excavation.

4.0 BASELINE ECOLOGICAL CONDITIONS

4.1 Designated Sites

Statutory Protected Sites

4.1.1 MAGIC was consulted for details of statutory protected sites within the vicinity of the site. The following Zones of Influence were used: SSSI & LNR within 2.0km and SAC, SPA, RAMSAR: within 10km.

Table No. 03 – Statutory Protected Sites

Site	Description	Location
South Downs National Park	The national park covers the chalk hills of the South Downs as well as a substantial part of the western weald.	1.53 km north
Arun Valley Ramsar, SAC, SPA	A 487-hectares (ha) of grassland, bogs and marshes. One of the main population centres for the Ramshorn Snail (<i>Anisus vorticulus</i>)	7.1 km NE
Duncton to Bignor Escarpment SAC	Mature beech woodland located on the steep scarp face of the South Downs. The site exhibits all stages in the ecological succession between	9.9 km NW

	<i>chalk grassland and woodland, and supports a rare fern, rare snail (<i>Helicodonta obvoluta</i>), and notable a moth community.</i>	
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Non-Statutory Protected Areas

- 4.1.2 *Sites of Nature Conservation Importance (SNCIs)* are designations applied to the most important non-statutory nature conservation sites. They are recognised by the *National Planning Policy Framework (2021)* and as such are material considerations when assessing planning applications; however, no SNCI's were found within the 2.0km potential zone of influence of the development.

4.2 Habitats

- 4.2.1 Within 2.0 km of the site there are *Priority Habitats* of *Coastal and Floodplain Grazing Marsh, Ancient & Semi-Natural Woodland, Deciduous Woodland* and *Traditional Orchard*.

- 4.2.2 Habitats within and adjacent to the land include:

- Hard / Bare Ground;
- Short Ephemeral;
- Dry Ditch
- Tall Ruderal;
- Dense Scrub
- Scattered Trees;

Hard / Bare Ground

- 4.2.3 Isolated areas of tarmac and concrete hardstanding exist to the east and north-east of the site. Species noted in these locations include: locally abundant areas of willowherb (*Epilobium sp.*), buddleia (*Buddleja davidii*) and sow-thistle (*Sonchus sp.*). This common and widespread habitat is of **negligible value**.

Ephemeral / Short Perennial

- 4.2.4 Almost the entirety of sites A and B are characterised by areas of short ephemeral vegetation. There is slightly higher species richness within Site A as compared to Site B.
- 4.2.5 Species noted within Site A include bristly ox-tongue (*Helminthotheca echinoides*) dominating with locally frequent areas of annual beard grass (*Polypogon monspeliensis*), common daisy (*Bellis perennis*), yorkshire fog (*Holcus lanata*), chickweed (*Stellaria media*) and curled dock (*Rumex crispus*). Occasionally, there is creeping thistle (*Cirsium arvense*), cocks-foot (*Dactylis glomerata*), ragwort (*Jacobaea vulgaris*) and chenopodium (*Chenopodium sp.*). Rarely, there is mugwort (*Artemisia vulgaris*), cow parsley (*Anthriscus sylvestris*), dandelion (*Taraxacum officinale*), perennial rye-grass (*Lolium perenne*) and ribwort plantain (*Plantago lanceolata*). This common and widespread habitat is of **site / negligible value**.
- 4.2.6 Species noted within Site B include bristly ox-tongue (*Helminthotheca echinoides*) dominating with locally frequent areas of haretail (*Lagurus ovatus*), willowherb (*Epilobium sp.*) and sow-thistle (*Sonchus sp.*). Occasionally, there is common fumitory (*Fumaria officinalis*), curled dock (*Rumex crispus*) and broad-leaved dock (*Rumex obtusifolius*). Rarely, there is yorkshire fog (*Holcus lanata*), perennial rye-grass (*Lolium perenne*) and wild fennel (*Foeniculum vulgare*). This common and widespread habitat is of **site / negligible value**.

Dry Ditch

- 4.2.7 To the northwest of site A there is an area of dry ditch / swale dominated by short ephemeral vegetation and grasses. Species noted here include: yorkshire fog (*Holcus lanata*), cocks-foot (*Dactylis glomerata*), smooth meadow-grass (*Poa pratensis*) and bristly ox-tongue (*Helminthotheca echinoides*), dominating. There are locally abundant areas of white clover (*Trifolium repens*) and bramble (*Rubus fruticosus*). Occasionally, there is buddleia (*Buddleja davidii*), creeping buttercup (*Ranunculus repens*), willowherb (*Chamaenerion sp.*), ribwort plantain (*Plantago lanceolata*) and thistle (*Cirsium sp.*). This small area of habitat is of **low site value**.

Tall Ruderal

- 4.2.8 Areas of tall ruderal vegetation exists around the site, mostly along the southern boundary fence of Site A and to the north of Site B. Common nettle dominates with areas of bramble (*Rubus fruticosus*), thistle (*Cirsium vulgare*), curled dock (*Rumex crispus*), bristly ox-tongue (*Helminthotheca echinoides*) and buddleia (*Buddleja davidii*) noted. To the north of Site B there is an earthen mound covered in dense vegetation including bristly ox-tongue, sowthistle and willowherb. This common and widespread habitat is of **site value only**.

4.2.9 Dense Scrub

Areas of dense scrub exist to the northern boundary of site B and to the north-western boundary of site A. Species noted here include dominant bramble (*Rubus fruticosus*) with locally dominant areas of creeping thistle (*Cirsium vulgare*) and occasionally buddleia (*Buddleja davidii*) and goat willow (*Salix caprea*). This common and widespread habitat is of **site value only**

Scattered Trees

- 4.2.10 Semi-mature and mature white poplars (*Populus alba*) grow along the northern border of site B. Other tree species noted here include frequent cypress (*Cupressaceae*) and, rarely, eucalyptus (*Eucalyptus sp.*), princess tree (*Paulownia tomentosa*) and laurel (*Prunus laurocerasus*). Juvenile trees, planted as part of the adjacent development, were also noted around the site including: locally dominant areas of norway maple (*Acer platanoides*), lime (*Tilia sp.*) with frequent hazel (*Corylus avellana*) and, occasionally, oak (*Quercus sp.*) and ash (*Fraxinus excelsior*). The mature and semi-mature treeline to the north and west of the Site are considered not be of **site / low local value**.

4.3 Protected Species

- 4.3.1 The following is based upon a detailed data search, field study and any further Phase 2 Protected Species Surveys which were undertaken on site.

Amphibians

Desk Study

- 4.3.2 No records of GCN exist within 2.0km of the site, with the nearest being 2.26km north-east of the proposed development site. There are six records of common frog (*Rana temporaria*) within 2.0km of the site.
- 4.3.3 It is accepted that, unless connected by high quality habitat, the majority of great crested newts tend to stay within 250m of breeding ponds (Langton *et al*, 2001). The intervening land between the closest ponds and the site is dominated by residential developments, hard bare ground and roads, unsuitable habitats for GCN.

Terrestrial Habitat Assessment

- 4.3.4 Tall ruderal and dense scrub to the north, west and south of the site margins do provide some limited suitable terrestrial habitat for GCN and common toad. Although, no suitable breeding habitat is presented by the site itself, no.2 waterbodies do exist c. 480 meters (m) to the south-east of the site, and these ponds might offer some suitable breeding habitat. However, these ponds are separated from the site by significant areas of hard bare ground, road and residential development which would present a significant barrier to dispersal.

Overall Site Assessment

- 4.3.5 Given the lack of records in the area, the absence of suitable breeding grounds within 250m of the site, and the unsuitable characteristics of adjoining habitats to the south-east, the site is considered to be of **negligible value** to GCN and common toad.

Reptiles

Desk Study

- 4.3.6 Records of grass snake, slow worm and adder exist within 2.0km of the site.

Initial Site Assessment

- 4.3.7 The site was found to contain areas of tall ruderal and dense ephemeral vegetation which were considered suitable for supporting reptiles, while the treeline and scrub to the northern boundary of the site were considered to offer suitable areas for shelter and hibernation.

Presence / Absence Survey

- 4.3.8 A peak count of 15no. adult slow worms were recorded on site during the surveys, with a number of juvenile grass snake and slow worm also found during the surveys. Although juvenile specimens do not contribute toward official population estimates, it is clear that the site is in use by both species.
- 4.3.9 Reptiles were distributed to the margins of the scrub to the north of parcel A, and along the swale / drainage feature to the north of parcel B.

Bats

Desk Study

- 4.3.10 Alcahoe (*Myotis alcathoe*), Common Pipistrelle (*Pipistrellus pipistrellus*), Soprano Pipistrelle (*Pipistrellus pygmaeus*), Nathusius Pipistrelle (*Pipistrellus nathusii*) Noctule (*Nyctalus noctula*), Serotine (*Eptesicus serotinus*), Brandts (*Myotis brandtii*), Whiskered (*Myotis mystacinus*), Daubenton's (*Myotis daubentonii*) and Brown Long-Eared bats have all been recorded within 2.0km of the site area.

Preliminary Roost Assessment

- 4.3.11 There are no existing buildings within the proposed construction zone and so no buildings were included within the roost assessment.
- 4.3.12 The majority of trees found on site were juveniles which contained no discernible potential roost features. A summary of those trees within the boundary tree lines which contained suitable features is shown below:

Table no. 04 – Trees with potential roost features

Ref.	Description	Category
T01	<i>Semi-Mature eucalyptus with cracked bark and small cavities. Small amount of deadwood throughout.</i>	<i>Low</i>
T02	<i>Mature poplar with deadwood and mature Ivy.</i>	<i>Moderate</i>
T03	<i>Mature poplar with deadwood and mature Ivy.</i>	<i>Moderate</i>
T04	<i>Mature poplar with split out main stem from low. Some deadwood and mature Ivy.</i>	<i>Moderate</i>
T05	<i>The remaining stump from a split out mature poplar. Some evidence of cavities and mature ivy throughout.</i>	<i>Moderate</i>
T06	<i>Mature poplar with deadwood and mature Ivy.</i>	<i>Moderate</i>
T07	<i>Mature poplar with deadwood and mature Ivy.</i>	<i>Moderate</i>

Foraging Suitability

- 4.3.13 The trees bordering the north and west of the site are likely to support foraging and commuting by numerous bat species. This habitat is likely to be of **site / low local importance** to the local bat community. The main body of the site is dominated by sparsely vegetated bare ground which is of **negligible value** to bat species.

Dormouse*Desk Study*

- 4.3.14 The data search returned 3no. records of dormice within 2.0km of the site.

Site Assessment

- 4.3.15 The proposed construction zone is formed of hard / bare ground and short ephemeral vegetation and as such offers no suitable habitat for dormice. Although bramble scrub and treelines to the north and east the of site do provide some suitable cover for foraging and hibernation, these areas are not functionally connected to areas of suitable dormouse habitat in the wider environment. The value of these areas is further reduced by the lack of favoured food plants and the limited records of dormice in the locality of the site. The construction zone is of **negligible value** to dormouse.

Badger*Desk Study*

- 4.3.16 Badger records are confidential and were therefore not included within the data search, however they are likely to be present in suitable habitat in the wider environment.

Preliminary Assessment

- 4.3.17 Single large mammal holes of a size and shape suitable for badger were noted to both the north-western boundary of site A and the northern boundary of site B. On a subsequent visit, a fresh latrine was recorded to the north-western boundary of site A. The site was considered to potentially be of moderate value to badger and additional surveys to both the noted burrows was advised.

Badger Sett Monitoring

- 4.3.18 Holes A, B & C were subject to detailed monitoring during September 2021, which did not record any badger usage of these areas. Badgers were recorded leaving the dense scrub along the northern boundary on two separate occasions; therefore some limited, supervised clearance of scrub in this area was advised so as to ascertain the presence / absence of further potential setts within this scrub.
- 4.3.19 Scrub clearance revealed 2 apparently well-used mammal holes (D & E), and 1 hole (F) which didn't appear to be in active use. Monitoring of these holes during November and December 2021 found no signs of use of hole E during the 21-day monitoring period. Holes C and D were found to be in active use by badgers during the entire monitoring period, though infrequently used. Holes C and D are considered to be a subsidiary sett, although the location of the main sett could not be determined during the survey period.

Water Vole*Desk Study*

- 4.3.20 The data search returned 15 no. records of water vole within 2.0km of the site, with the nearest being located 268 m to the north-east within black ditch – a tributary of the River Arun.

Site Assessment

- 4.3.21 A dry ditch, filled with bramble scrub and tall ruderal vegetation, borders the entire length of the northern boundary of site B; an additional length of dry ditch / swale is located to the north-east of Site A. No tracks, feeding remains or latrines were recorded within these areas, and, at the time of survey, these areas were completely dry.
- 4.3.22 Although records of water vole, and areas of suitable water vole habitat, do exist beyond the site to the north – these areas are not functionally connected to the ditches bordering Site A and B. The value of the on-site ditches is further reduced by the lack of favoured food plants. No ditches, offering suitable habitat, were located on site. The site is of **negligible value** to water vole.

Other Mammals

- 4.3.23 Numerous records of common mammals including rabbit exist within 2.0km of the site area.

*Birds**Desk Study*

- 4.3.24 A total of 146 no. bird species have been returned within 2.0km of the site, including 19 no. Schedule I species and 22 no. species listed on the BoCC Red List.

Site Assessment

- 4.3.25 Optimal nesting habitat is limited to the surrounding bramble scrub and tree lines to the north and west of Site B. The site is of negligible suitability to wintering waders and wildfowl due to the high levels of human disturbance within the vicinity. The area overall is likely to be of **site value** to breeding / foraging birds and **negligible value** to wintering waders and wildfowl.

*Invertebrates**Desk Study*

- 4.3.26 The data search returned records of numerous species of invertebrates within 2.0km of the site including stag beetle (*Lucanus cervus*).

Site Assessment

- 4.3.27 Suitable habitat for invertebrates includes the tree lines, and areas of standing deadwood, located along the northern border of the site. The site in general lacks the floral diversity to support a good range of invertebrates and is considered to be of no more than **site value**.

Others

- 4.3.28 No suitable habitat for any other protected species was recorded on site.

5.0 ASSESSMENT OF EFFECTS AND MITIGATION MEASURES

5.1 Designated Sites

Potential Impacts

- 5.1.1 The site is located within 10km of Arun Valley Ramsar, SAC, SPA and Duncton to Bignor Escarpment SAC. These designated sites contain areas of calcareous grassland, mesophile grassland, bogs and marshes. The habitats which will be directly impacted by the proposals are distinctly different from those found within Arun Valley Ramsar, SAC, SPA and Duncton to Bignor Escarpment SAC; there will be no loss of supporting habitat due to these proposals. These protected sites are susceptible to impacts from increased recreational pressure, however the proposed development does not lie within the impact risk zones associated with these sites.

- 5.1.2 Due to the intervening distances, no impacts upon any near-by SNCI's are anticipated.

Residual Impacts

- 5.1.3 There will be **no likely significant effect** upon any surrounding European protected site as a result of this development.

5.2 Habitats

Potential Impacts

- 5.2.1 Development proposals will result in the loss of areas of hard bare ground, covered in short ephemeral vegetation, as well as limited areas of tall ruderal. In addition, the proposals would require the removal of a large area of dense bramble scrub to the north of the site. The loss of ephemeral vegetation would be of minor impact magnitude given the poor quality of habitat in question. The loss of dense scrub, and limited areas of tall ruderal, to the north of the site would be of moderate impact magnitude at the site level given the extent of habitat in question.
- 5.2.2 In the absence of mitigation, impacts upon retained trees to the north and northwest of the site could include root compaction, smothering by dust, damage through vehicle strike and emissions during the construction phase as well as degradation through pollution events.

Mitigation and Compensation

- 5.2.3 The treelines along the north-western and northern boundaries are to be retained within the proposals and a fringe of the existing dense scrub habitat, in proximity to these tree-lines, will be retained. Land directly south of the retained scrub, to the north and north-west of the site, will be planted with a strip of native shrubs and suitable wildflower grassland to create a gradual ecotone between areas of soft landscaping and retained tree lines to the north and north-west of the site.
- 5.2.4 Works during the construction phase will be undertaken in accordance with guidance provided within *The Control of Dust and Emissions During Construction and Demolition SPG (July 2014)* to control any excess dust creation which may impact adjacent priority habitat.

Residual Impacts

- 5.2.5 No priority or other important habitats or plant species will be affected by this development, the impact of which is **negligible**.

5.3 Amphibians

Potential Impacts

- 5.3.1 Given the lack of records in the area, the absence of suitable breeding grounds in the vicinity of the site, and the unsuitable characteristics of adjoining habitats to the south-east, the site is considered to be of negligible value to GCN and common toad.

Mitigation and Compensation

- 5.3.2 None required. Proposed enhancements will increase the overall value of the site for amphibians. In the unlikely event that GCN are found on site all works will cease while a suitably qualified ecologist is contacted for advice.

Residual Impacts

- 5.3.3 The overall impact of the scheme will be **non-significant**, minor-adverse in the short-term, with a minor **positive impact** in the long-term once enhancements have been implemented.

5.4 Reptiles

Potential Impacts

- 5.4.1 In the absence of mitigation, impacts could include killing or injuring individual reptiles, increased predation, habitat removal and habitat fragmentation. Impacts would be of moderate impact magnitude and highly likely to occur.

Mitigation and Compensation

- 5.4.2 The following mitigation measure should be implemented during site clearance and construction to avoid any potential harm to any reptile species present:
- A 3-metre strip of land to the south of the retained bramble scrub, to the north and north-west of the site, is to be cleared under ecological supervision. The retained scrub and newly cleared 3-metre strip will constitute a buffer strip covering the full length of the northern and north-western boundaries
 - The newly cleared 3-metre strip of land will then be enhanced pre-works by the addition of log piles, compost piles, installation of hibernacula.

- Temporary reptile fencing shall be erected around the entire construction area, excluding the buffer strip to the north and northwest.
- All reptiles to be translocated from the grassland swale, northern areas of short ephemeral vegetation and bramble scrub into the buffer area. A minimum of 30 days translocation should be conducted, given the population sizes on-site and area of habitat lost. The translocation will continue until 5no. days have passed in suitable weather conditions with no reptiles found.
- Following completion of the translocation exercise, a destructive search of all suitable areas of reptile habitat shall be undertaken.
- All vegetation clearance and removal of any potential refugia or hibernation features (*such as log piles, tree/shrub stumps, brash or rubble*) shall be removed during the summer months when reptiles are active and able to move away from harm.
- Vegetation within the construction zone is to be kept short (<50mm) prior to and during work to prevent reptiles recolonising the area.
- All contractors should be given a toolbox talk to make them aware of the presence of reptiles in the locality, and location of exclusion zones and retained habitat.

5.4.3 Following completion of the development, the buffer zone to the north and north west of the site are to be retained as suitable reptile habitat. The areas of buffer not covered in pre-existing scrub will be formed of tussocky wildflower strip enhanced with log and compost piles. Areas of suitable reptile habitat created within the scheme will be subject to a management plan to ensure they remain in optimal condition.

Residual Impacts

5.4.4 Once mitigation is taken into account, the impacts will be **negligible** overall.

5.5 Bats

Potential Impacts

5.5.1 In the absence of mitigation impacts may include habitat fragmentation, loss of foraging areas, increased predation and killing or injuring of individual bats.

Mitigation and Compensation

- 5.5.2 All trees within northern and north-western tree line, which offer bat roost suitability, are to be retained and protected within the scheme. Existing boundary vegetation shall be retained to allow its continued use by foraging and commuting bats.
- 5.5.3 A sensitive lighting scheme will be employed with lighting kept to the minimum levels and angled down and away from surrounding tree lines, and mature trees. Lighting shall be designed in accordance with ILP Guidance Note 08/18 wherever possible.

Residual Impacts

- 5.5.4 The overall impact of the scheme will be **negligible**.

5.6 Dormouse*Potential Impacts*

- 5.6.1 None predicted, the main body of the site is formed of hard bare ground with short ephemeral vegetation of negligible value to this species.

Mitigation and Compensation

- 5.6.2 All areas of tree line to the north and northwest of the site will be retained and protected within the scheme. No specific mitigation required.

Residual Impacts

- 5.6.3 The overall impact of the scheme will be **negligible, non-significant**

5.7 Badgers

Potential Impacts

- 5.7.1 In the absence of mitigation, impacts would include the damage or disturbance of a badger sett in contrary to The Protection of Badgers Act 1992, trapping of badgers in footings/trenches, fragmentation of habitat and disruption of commuting corridors. Impacts would be of major impact magnitude at the site level and certain to occur.

Mitigation and Compensation

- 5.7.2 The identified sett (holes D and E) is located to the north-western boundary of parcel B, and within 10m of the proposed development. As such a licence shall be required from Natural England to allow closure of the sett. The following mitigation shall be employed:
- Once the licence is received, the sett shall be closed using one-way badger gates and chain link fencing left in place for a minimum of 21 days.
 - Gates will be checked every 3 days for signs that badgers are entering or exiting the sett.
 - Following the 21 day period, the sett shall be destroyed and secured using heave gauge mesh to ensure the area is not re-excavated.
 - Sett closure shall only take place between 1st July and 30th November to avoid disruption of breeding badgers.
- 5.7.3 As the vegetation is dense in areas across the site, if any other potential setts are discovered during the course of works, all operations will cease until further investigations have been undertaken to establish how the holes are being used. Should this occur, the mitigation shall be amended an appropriate and agreed with Natural England.
- 5.7.4 At night and when the site is unattended, any footings or trenches over 1m deep should be covered or have a ramp inserted to ensure any animals that fall in are able to escape easily. Pipework over 200mm diameter should be covers overnight to prevent badgers gaining access, and all piles of loose spoil should be checked daily for signs of badger excavation.

- 5.7.5 Boundary vegetation and tree lines to the north-western boundary of the site will be retained within the proposals to allow their continued use by badgers. The area will be re-enforced with native scrub planting to provide a suitable area for badger re-habitation.

Residual Impacts

- 5.7.6 Once mitigation measures are taken into account, the overall impact of the scheme will be **negligible**.

5.8 Water Voles

Potential Impacts

- 5.8.1 No evidence of water vole was found within or adjacent to the site. The site contains no suitable water vole habitat in the immediate vicinity of the site, with the pond currently too dry and scrubby.

Mitigation and Compensation

- 5.8.2 No potential for impacts.

Residual Impacts

- 5.8.3 The overall impact of the scheme will be **negligible**.

5.9 Birds

Potential Impacts

- 5.9.1 In the absence of avoidance / mitigation, the development could result in the damage / destruction of a bird nest and loss of foraging / commuting areas.

Mitigation and Compensation

- 5.9.2 Clearance of any tall ruderal, scrub or trees will be undertaken outside the bird nesting season. Should this not be possible, vegetation will be checked prior to removal by a Suitably Qualified Ecologist. The loss of suitable vegetation on site will be compensated through the incorporation of integrated nest boxes suitable for a range of species into new buildings and mature trees.

- 5.9.3 Valuable foraging habitat on site, in the form of tree lines, will be retained within the proposals.

Residual Impacts

- 5.9.4 The overall impact of the scheme will be **negligible**.

5.10 Invertebrates

Potential Impacts

- 5.10.1 In the absence of mitigation, the development would result in the modification of limited areas of tall ruderal as well as extensive areas of short ephemeral vegetation and dense continuous bramble scrub, resulting in a moderate loss of invertebrate foraging habitat.

Mitigation and Compensation

- 5.10.2 The scheme shall include areas of new wildflower planting and the use of trees / shrubs within the landscape scheme which have a recognised wildlife value.

Residual Impacts

- 5.10.3 The overall impact of the scheme will be moderate in the short-term, with a **positive impact** in the long-term once enhancements have been implemented.

6.0 ENHANCEMENTS

6.1 The design of the proposed development includes ecological enhancements for the benefit of wildlife in line with the *National Planning Policy Framework* and *Local Planning Policy*. Ecological enhancements which will be included as part of development proposals (*in addition to the mitigation measures above*) include:

- Southern fringe of buffer zones to be planted with native shrubs and suitable wildflower grassland to create a gradual ecotone between tree lines and the development.
- The use of flowering plants as listed within the RHS 'Plants for Pollinators' within the soft landscape scheme.
- The use of seed and fruit bearing species of tree such as cherry, rowan, birch and crab apple to provide a foraging resource for birds and insect.
- The use of log and compost piles in habitat creation areas to provide refugia for reptiles and amphibians.
- Installation of integrated bird and bat boxes into new buildings, and 'bug hotels', bird and bat boxes to mature trees.
- The use of flowering lawn in areas which require regular mowing rather than a standard amenity mix.
- Any new closed board fencing to be erected as part of proposals should incorporate 'hedgehog friendly' gravel boards which include a 13x13cm gap to allow movement of hedgehogs.

7.0 CONCLUSIONS

- 7.1 The development site is formed of common, widespread habitats of low ecological value. Floral diversity in general was very low, with the bulk of the site dominated by short hard bare ground, short ephemeral vegetation and bramble scrub.
- 7.2 The northern extent of the site is located within the *Impact Risk Zone* of *Arundel Park SSSI* and development proposals meet the criteria which would require the LPA to consult with Natural England (Residential developments of 50 units or more). The site is also located within 10km of Arun Valley Ramsar, SAC, SPA and Duncton to Bignor Escarpment SAC. These protected sites are susceptible to impacts from increased recreational pressure, however the proposed development does not lie within the impact risk zones associated with these sites. In addition, the site contain no habitat suitable for supporting Bewicks Swan or other wildfowl / waders associated with Arun Valley SPA / SAC. There will be **no likely significant effect** upon the surrounding protected sites as a result of the development proposals.
- 7.3 A subsidiary badger sett was identified towards the north-western boundary of parcel A. Due to the proximity of this sett to the development, a licence shall be sought from Natural England to allow closure of the sett.
- 7.4 The site was found to support a good population of slow worm, with juvenile grass snake also present. A full translocation of all reptiles on site shall be completed to ensure works proceed in accordance with The Wildlife and Countryside Act 1981 (as amended).
- 7.5 The site contains some limited suitable habitat for nesting birds, invertebrates and bats, however the detailed avoidance and mitigation measures detailed above shall ensure the impacts of the planned development upon biodiversity will be **negligible**.

8.0 REFERENCES

JNCC: Handbook for Phase 1 Habitat Survey – A Technique for Environmental Audit; (2003);

Collins J (ed): Bat Surveys for Professional Ecologists: Good Practice Guidelines (3rd ed.) The Bat Conservation Trust (2016);

Mitchell-Jones and McLeish: Bat Workers Manual; JNCC, 3rd Edition (2004);

Streeter, D.: The Most Complete Guide to the Flowers of Britain and Ireland; Harper Collins, London (2010);

www.magic.gov.uk.

Table No. 5 – Species List for Habitat Parcels**Short Ephemeral Vegetation**

Common Name	Scientific Name	DAFOR
Annual Beard Grass	<i>Polypogon monspeliensis</i>	LF
Annual Beard Grass	<i>Polypogon monspeliensis</i>	LF
Bristly ox-tongue	<i>Helminthotheca echinoides</i>	D
Chenopodium	<i>Chenopodium sp.</i>	O
Chickweed	<i>Stellaria media</i>	LF
Cocks-foot	<i>Dactylis glomerata</i>	LD
Common Daisy	<i>Bellis perennis</i>	LF
Common Fumitory	<i>Fumaria officinalis</i>	O
Cow Parsley	<i>Anthriscus sylvestris</i>	R
Creeping Thistle	<i>Cirsium arvense</i>	O
Curled Dock	<i>Rumex crispus</i>	LF
Dandelion	<i>Taraxacum officinale</i>	R
Haretail	<i>Lagurus ovatus</i>	F
Mugwort	<i>Artemisia vulgaris</i>	R
Perennial ryegrass	<i>Lolium perenne</i>	O
Ragwort	<i>Jacobaea vulgaris</i>	O
Ribwort Plantain	<i>Plantago lanceolata</i>	R
Sow-Thistle	<i>Sonchus sp.</i>	LF
Wild Fennel	<i>Foeniculum vulgare</i>	R
Willow Herb	<i>Epilobium sp.</i>	F
Yorkshire Fog	<i>Holcus lanatus</i>	LF

Dry Ditch / Swale

Common Name	Scientific Name	DAFOR
Bramble	<i>Rubus fruticosus</i>	LA
Bristly ox-tongue	<i>Helminthotheca echinoides</i>	LD
Buddleja	<i>Buddleja davidii</i>	O
Cocks-foot	<i>Dactylis glomerata</i>	LD
Creeping Buttercup	<i>Ranunculus repens</i>	O
Creeping Thistle	<i>Cirsium arvense</i>	O
Perennial ryegrass	<i>Lolium perenne</i>	O
Ribwort Plantain	<i>Plantago lanceolata</i>	O
Smooth Meadow Grass	<i>Polypogon monspeliensis</i>	LD
White Clover	<i>Trifolium repens</i>	LA
Willow Herb	<i>Epilobium sp.</i>	O
Yorkshire Fog	<i>Holcus lanatus</i>	LD

D – Dominant; A – Abundant; F – Frequent; O – Occasional; R – Rare; L – Locally

Table No. 5 – Species List for Habitat Parcels Cont.....**Tall Ruderal**

Common Name	Scientific Name	DAFOR
Bramble	<i>Rubus fruticosus</i>	LF
Buddleia	<i>Buddleja davidii</i>	O
Common Nettle	<i>Urtica dioica</i>	D
Creeping Thistle	<i>Cirsium arvense</i>	LF
Curled Dock	<i>Rumex crispus</i>	LF

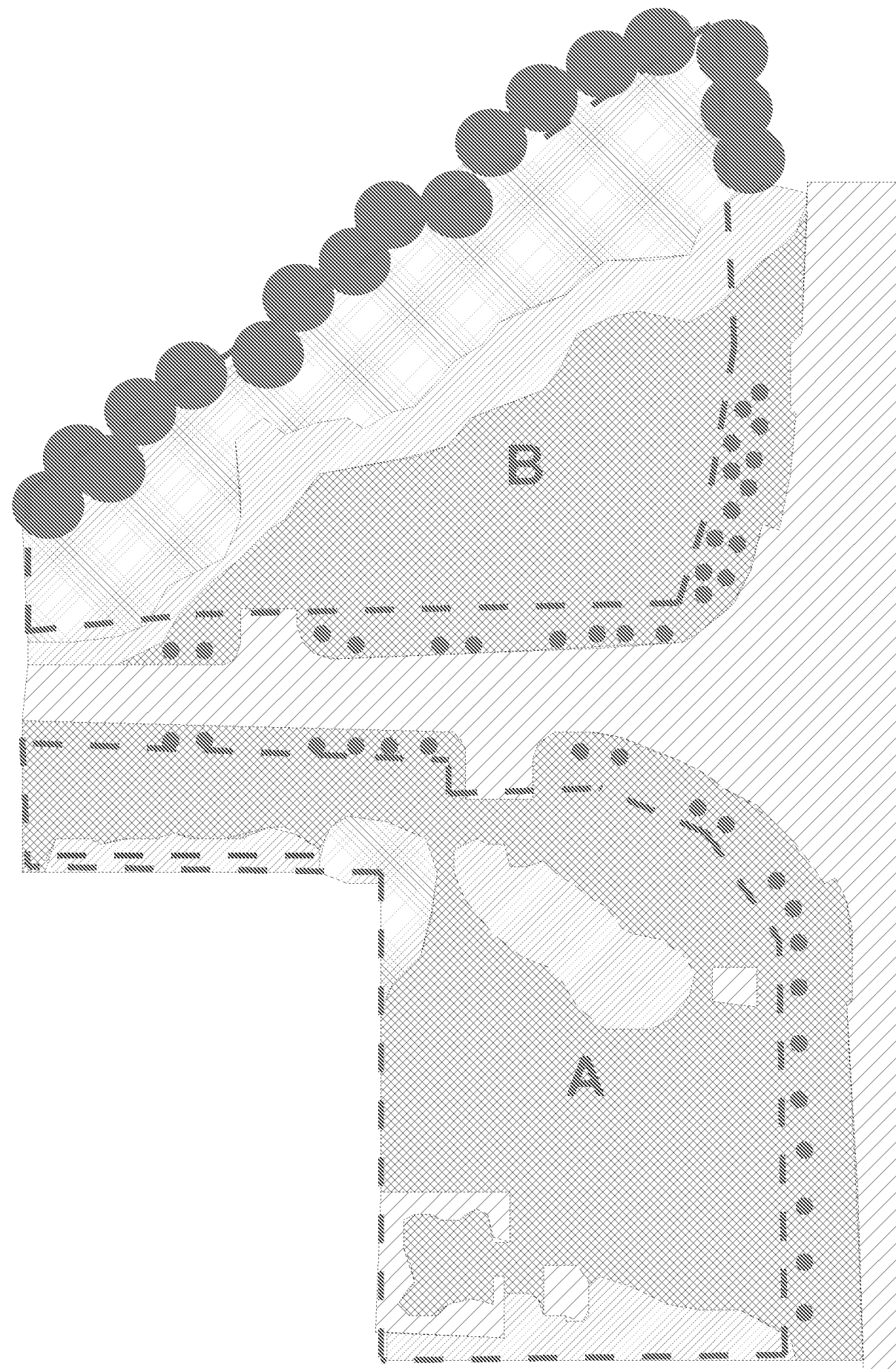
Dense / Continuous Scrub

Common Name	Scientific Name	DAFOR
Asparagus	<i>Asparagus officinalis</i>	R
Bramble	<i>Rubus fruticosus</i>	D
Buddleia	<i>Buddleja davidii</i>	O
Common Nettle	<i>Urtica dioica</i>	LF
Creeping Thistle	<i>Cirsium vulgare</i>	LD
Goat Willow	<i>Salix caprea</i>	O

Scattered Trees

Common Name	Scientific Name	DAFOR
Ash	<i>Fraxinus excelsior</i>	O
Cypress	<i>Cupressacea sp.</i>	LD
Eucalyptus	<i>Eucalyptus sp.</i>	R
Goat Willow	<i>Salix caprea</i>	O
Hazel	<i>Corylus avellana</i>	F
Laurel	<i>Prunus laurocerasus</i>	R
Lime	<i>Tilia sp.</i>	LD
Oak	<i>Quercus sp.</i>	O
Poplar sp.	<i>Populus sp.</i>	LD

D – Dominant; A – Abundant; F – Frequent; O – Occasional; R – Rare; L – Locally



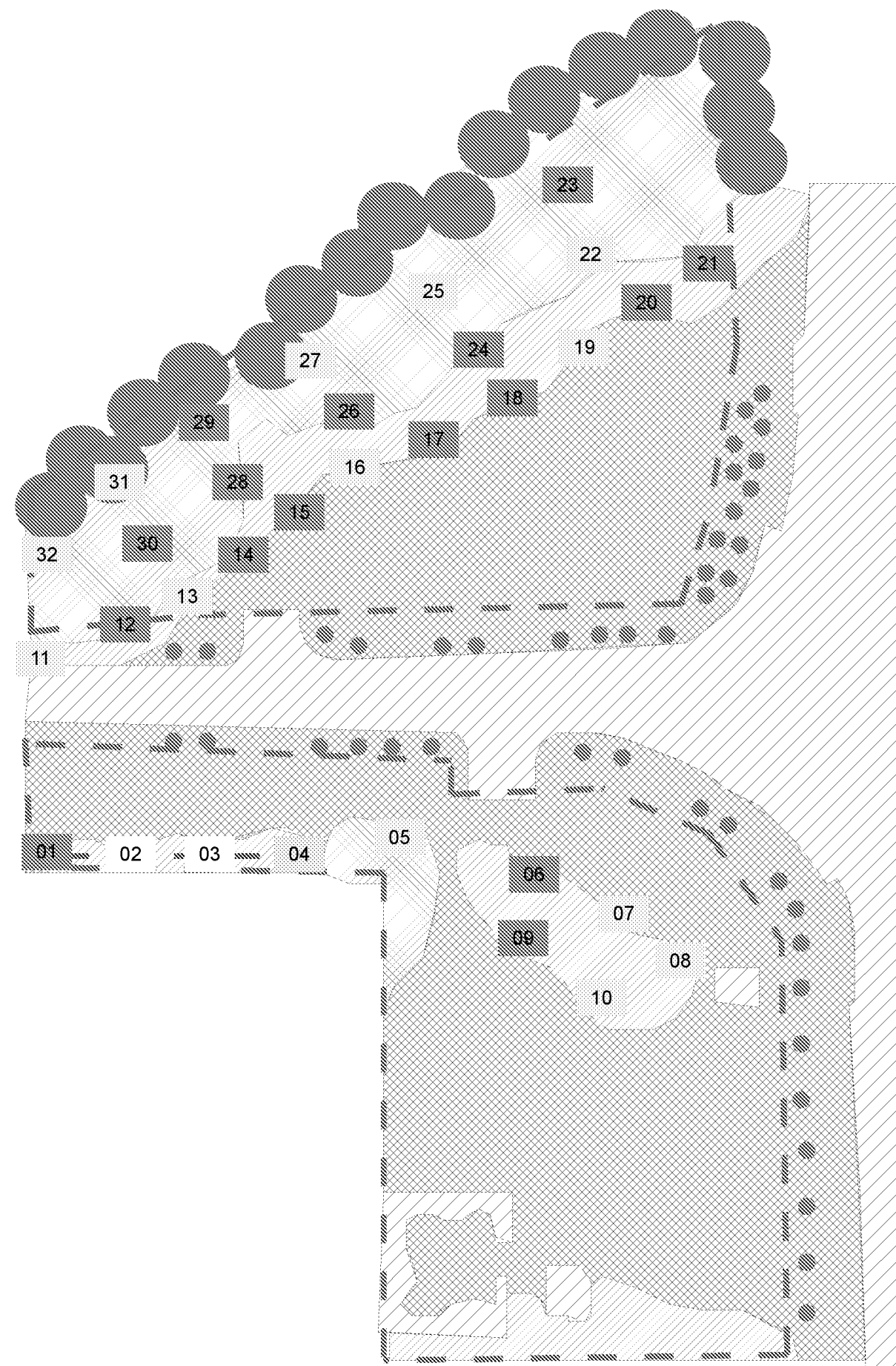
Key:

-  = Hard / Bare Ground
-  = Ephemeral / Short Perennial
-  = Tall Ruderal
-  = Dense Scrub
-  = Scattered Trees
-  = Dry Ditch



Not to Scale

Figure No. 01 – Site Habitat Plan
Land north of Toddington Lane, Littlehampton



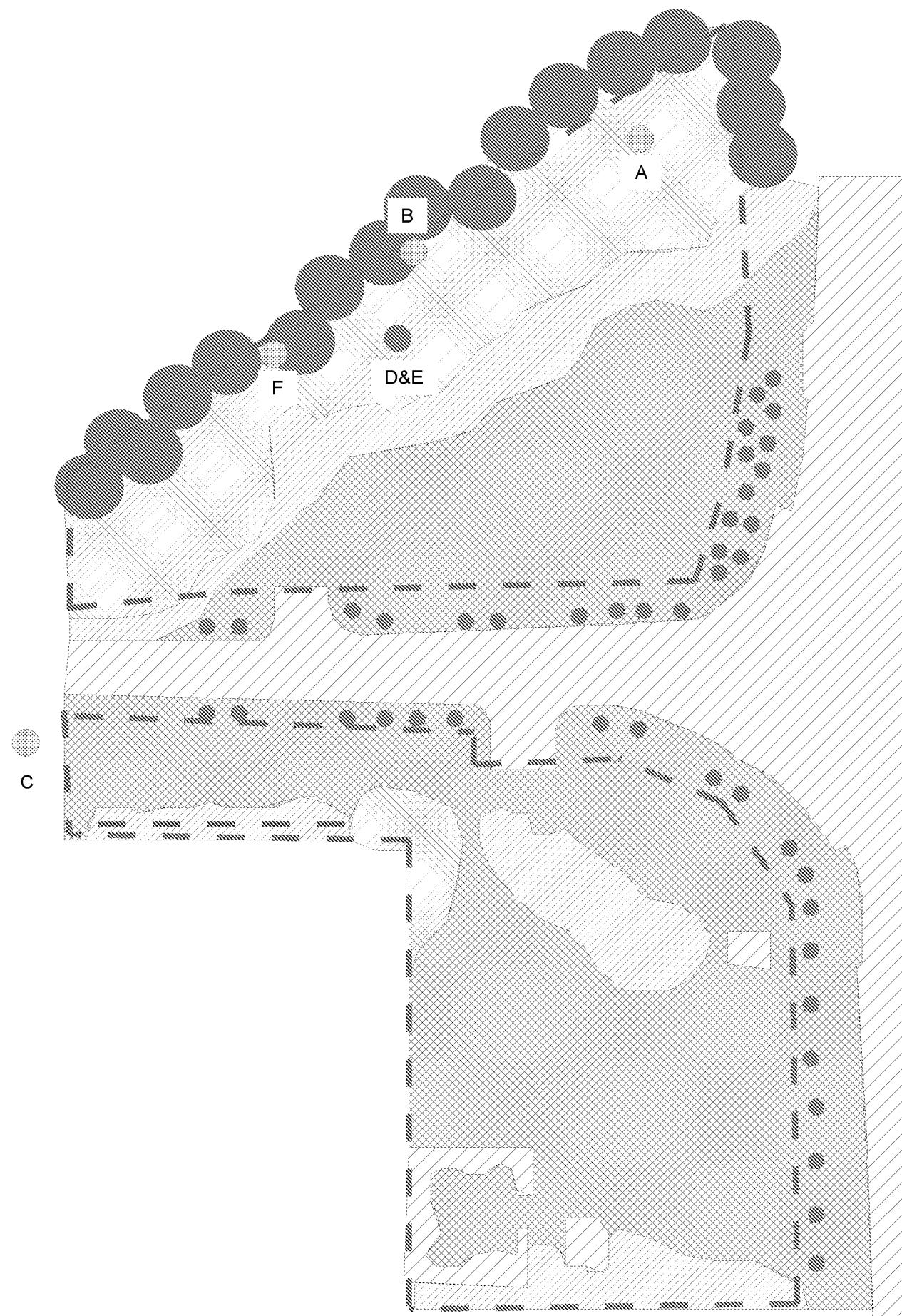
Key:

-  = Hard / Bare Ground
-  = Ephemeral / Short Perennial
-  = Tall Ruderal
-  = Dense Scrub
-  = Scattered Trees
-  = Dry Ditch
-  = Location of Reptile Refugia
-  = Location of Slow Worm
-  = Location of Grass Snake
-  = Location of Slow Worm and Grass Snake



Not to Scale

**Figure No. 02 – Location of Reptile Refugia
Land north of Toddington Lane, Littlehampton**



- Key:**
- = Hard / Bare Ground
 - = Ephemeral / Short Perennial
 - = Tall Ruderal
 - = Dense Scrub
 - = Scattered Trees
 - = Dry Ditch
 - = Not in active use by badgers
 - = Holes in active use



Not to Scale

**Figure No. 03 – Location of Badger Sett Monitoring
Land north of Toddington Lane, Littlehampton**

Appendix A – Site Photographs



Image 01 – View across Site A with areas of ephemeral vegetation and tall ruderal visible.



Image 02 – View across Site B with short ephemeral vegetation and northern tree line beyond.



Image 03 – View of vegetation covered earthen mound to the north of Site A.



Image 04 – View across eastern section of dry ditch / swale located to the north-west of Site A.



Image 05 – Image of one of the mammal burrows noted on site.



Image 06 – Badgers were recorded occasionally utilising the holes along the northern boundary of site B.

Appendix B – Full Results of Reptile Surveys

Visit 1				
Surveyor	GQ			
Date	31/08/21			
Time	16:00			
Temperature	21			
Wind (Beaufort)	3			
Weather	Overcast			
Tile No.	Species	Ad/J	Sex	Notes
02	Slow Worm	Adult	Female	2nd tile along feather board fence, NW of site A
03	Slow Worm	Adult	Female	
03	Grass Snake	Juvenile	Unknown	Under same tile
06	Slow Worm	Adult	Female	First in line to south of heras fencing to the north of site B
09	Slow Worm	Adult	Female	
09	Slow Worm	Adult	Male	19 + 20 Under same tile.
12	Slow Worm	Adult	Female	Same tile, first on border line, starting north west of site A. Access via swale
12	Slow Worm	Adult	Female	Same tile as above.
30				first one along western cleared path through centre of bramble scrub.
28	Slow Worm	Adult	Female	
29	Slow Worm	Adult	Female	
15	Slow Worm	Adult	Female	
15	Slow Worm	Adult	Female	
17	Slow Worm	Adult	Female	
17	Slow Worm	Adult	Female	
18	Slow Worm	Adult	Female	
23	Slow Worm	Adult	Male	Large individual, found within easterly cleared path
Visit 2				
Surveyor	GQ			
Date	03/09/21			
Time	10:00			

Temperature	17			
Wind (Beaufort)	4			
Weather	Overcast			
Tile No.	Species	Ad/J	Sex	Notes
01	Slow Worm	Adult	Female	1 st along feather-board fencing to NW of site A
12	Slow Worm	Adult	Unknown	
13	Slow Worm	Adult	Female	
14	Slow Worm	Adult	Female	
16	Slow Worm	Adult	Female	1 st along west of haris fencing
30	Slow Worm	Adult	Female	Very large female
32	Slow Worm	Adult	Female	
32	Slow Worm	Adult	Female	
33	Slow Worm	Adult	Female	
33	Slow Worm	Juvenile	Female	
35	Slow Worm	Adult	Male	
35	Slow Worm	Adult	Female	
36	slow worm	Adult	Male	Large individual, found within easterly cleared path
Visit 3				
Surveyor	GQ			
Date	03/09/21			
Time	10:00			
Temperature	17			
Wind (Beaufort)	4			
Weather	Overcast			
Tile No.	Species	Ad/J	Sex	Notes
02	Slow Worm	Adult	Unknown	
03	Slow Worm	Adult	Female	
04	Slow Worm	Adult	Male	

06	Slow Worm	Juvenile	Female	1st along west of haris fencing
09	Slow Worm	Adult	Female	
15	Slow Worm	Adult	Female	
17	Slow Worm	Adult	Male	
18	Slow Worm	Adult	Female	
20	Slow Worm	Adult	Female	
23	Slow Worm	Juvenile	Male	
Visit 4				
Surveyor	GQ			
Date	09/09/2021			
Time	09:30			
Temperature	18			
Wind (Beaufort)	4			
Weather	Overcast			
Tile No.	Species	Ad/J	Sex	Notes
08	Slow Worm	Adult	Female	
21	Slow Worm	Adult	Male	
Visit 5				
Surveyor	GQ			
Date	03/09/21			
Time	10:00			
Temperature	17			
Wind (Beaufort)	4			
Weather	Overcast			
Tile No.	Species	Ad/J	Sex	Notes
03	Slow Worm	Adult	Male	
20	Slow Worm	Adult	Female	

21	Slow Worm	Juvenile	Female	
22	Slow Worm	Adult	Female	
17	Slow Worm	Adult	Female	Gravid
28	Slow Worm	Adult	Male	
Visit 6				
Surveyor	GQ			
Date	21/09/21			
Time	09:30			
Temperature	16			
Wind (Beaufort)	2			
Weather	Light Cloud			
Tile No.	Species	Ad/J	Sex	Notes
02	Slow Worm	Adult	Male	
02	Slow Worm	Adult	Female	
09	Slow Worm	Juvenile	Female	
Visit 7				
Surveyor	GQ			
Date	03/09/21			
Time	10:00			
Temperature	17			
Wind (Beaufort)	4			
Weather	Overcast			
Tile No.	Species	Ad/J	Sex	Notes
01	Slow Worm	Adult	Female	
01	Slow Worm	Adult	Male	
02	Grass Snake	Juvenile	Unknown	
03	Slow Worm	Adult	Female	
03	Slow Worm	Adult	Male	

04	Grass Snake	Juvenile	Unknown	
04	Grass Snake	Juvenile	Unknown	
04	Grass Snake	Juvenile	Unknown	
26	Slow Worm	Adult	Female	
24	Slow Worm	Juvenile	Female	
14	Slow Worm	Juvenile	Unknown	