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Craigforth

Preliminary Ecological Appraisal

Babbity Environmental Ltd.,

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1. INTRODUCTION

1.1. Background

Babbity Environmental Ltd, was commissioned to undertake a Preliminary Ecological Appraisal (PEA) and assessment in respect of proposed mixed-use development at Craigforth, Stirling. The site is primarily used as a business park, but also accommodates a children's nursery within Craigforth House.

1.2. Site Location

The Development site lies adjacent and west to the Raploch area in Stirling. The footprint of the Development covered by the current survey and assessment is located at grid reference NS 77404 95107.

2. METHODS

2.1. Desk Study

A review of background data was carried out at the start of the commission and ahead of the field survey. Information sources used for this review are described below:

- Google Earth (<http://earth.google.co.uk>) - aerial imagery was obtained and used to inform the field survey;
- SNH Sitelink (<http://gateway.snh.gov.uk/sitelink/>) - sitelink was used to determine the location of any sites designated for nature conservation and their qualifying features; and
- NBN Atlas (<http://data.nbn.org.uk>) - the NBN was used to identify any available species records. This search was limited to commercially useable data and limited to records of protected mammal, reptile and amphibian species within 5 km of the Development site, and limited to the most recent five years of available data.

2.2. Bird and Mammal Walkover Survey

After consideration of the species found within the desktop study a survey methodology was devised. The protected species survey area comprised the Development Site and suitable additional survey areas in accordance with best practice for the ecological receptors considered to be potentially present. The survey was undertaken on 24th May 2019. The methodologies used for the walkover surveys are listed on Table 2.1. Target Notes highlighting points of ecological interest and the locations of invasive species are presented Figure 1.











Table 2-1: Survey Elements, Methods Considered and Coverage

Species/Guild	Survey Methods
Birds	Walkover survey looking for nesting birds, actual bird sightings, bird sounds and other field signs such as feathers, pellets etc. The survey area for this receptor comprised accessible land within 50m of the Development site.



Species/Guild	Survey Methods
Otter and Water Vole	<p>Chanin (2003) "Monitoring the Otter" and Liles (2003) "Conserving Otter Breeding Sites". Any evidence of the presence of otter, such as places of rest (holts or couches), spraint sites, prints and slides, as well as any otter sightings would be recorded as part of the walkover survey.</p> <p>English Nature (2001) "Water Vole Conservation Handbook". Surveys focused on recording the presence of any riparian burrows, above ground nests, feeding stations and latrines.</p> <p>The survey area for these receptors comprised accessible suitable habitat (watercourses, waterbodies and riparian habitat) within 250m of the Development site.</p>
Bats	<p>Collins (2016). Bat Surveys for Professional Ecologists: Good Practice Guidelines. The buildings, woodland areas and standard trees within the site were categorised (high, medium, low or negligible) for their potential to support roosting bats.</p> <p>The survey area for this receptor comprised accessible land within 50m of the Development site.</p>
Badger	<p>Harris et al. (1989) "Surveying Badgers". Evidence for the presence of badger was searched for including the presence of setts, foraging signs, latrines, prints, mammal paths and guard hairs, as well as any badger sightings.</p> <p>The survey area for this receptor comprised accessible land within 50m of the Development site.</p>
Red Squirrel	<p>Gurnell et al. (2001). Visual assessments within suitable habitat areas (woodland edges, paths, and rides) were made for this species. Evidence of the presence of squirrels, such as sightings, dreys and stripped cones were also recorded.</p> <p>The survey area for this receptor comprised accessible land within 50m of the Development site.</p>
Pine Marten	<p>Walkover survey looking for potential den sites, prints, scats, feeding remains, and recording and actual sightings.</p> <p>The survey area for this receptor comprised accessible land within 50m of the Development site.</p>
Invasive Species	<p>A walkover survey was undertaken to record the presence of any invasive species listed on Schedule 9 of the Wildlife and Countryside Act.</p> <p>The survey area for this receptor comprised accessible land within 50m of the Development site.</p>

LEGEND

-  Target Notes
-  Indicative Site Boundary
-  A1.3.1 - Mixed woodland - semi-natural
-  A1.3.2 - Mixed woodland - plantation
-  A3.1 - Broadleaved trees
-  B5 - Marsh/marshy grassland
-  G1.2 - Standing water - mesotrophic
-  G2.2 - Running water - mesotrophic
-  J1.1 - Cultivated/disturbed land - arable
-  J1.2 - Amenity grassland

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Figure 3.1

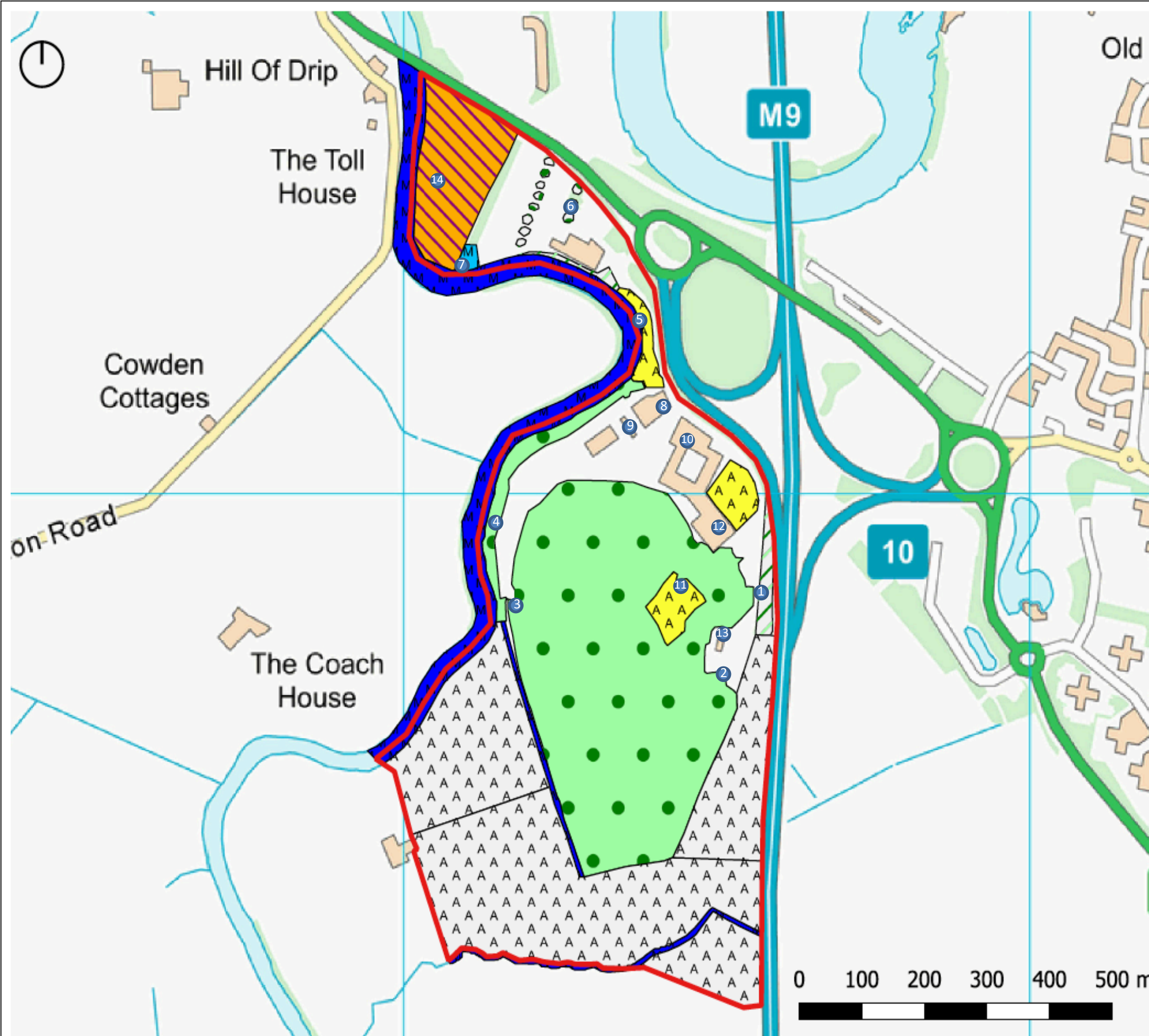
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Title Field survey results

Project

Number BP2009

Name: Craigforth



Target note Number	Grid Reference	Feature
1	NS 77569 94964	Line of mature lime trees. Low bat roost potential. Good navigation feature for bats.
2	NS 77525 94714	Mature trees associated with wider area of woodland around crag. Varying levels of bat potential low to high. Notably a Small leaved lime with high bat potential.
3	NS 77174 94857	Giant hogweed at edge of car park.
4	NS 77134 94972	Riparian Woodland adjacent to the River Forth - comprises ash, cherry and oak. A well managed, established beech hedge forms the boundary between the car park and the riparian woodland.
5	NS 77358 95287	Established stands of Himalayan balsam and giant hogweed on this section of the River Forth.
6	NS 77270 95409	Group of mature oak trees medium bat potential.
7	NS 77103 95357	Pond - choked with emergent vegetation greater reedbed. Little in the way of standing water at the time of survey.
8	NS 77411 95143	Gatehouse building – Low bat potential.
9	NS 77354 95105	Small brick building between Riverside Building and Administration Centre – Low bat potential.
10	NS 77430 95038	Main/Central buildings – Low bat potential.
11	NS 77468 94869	Craigforth House (Little Stars Nursey) – High bat potential.
12	NS 77516 94951	Dining Hall and Conference Centre – low bat potential.
13	NS 77504 94758	Bungalows X 2 – low bat potential.
14	NS 77083 95519	Giant hogweed in marshy grassland.



3. RESULTS

3.1. Desktop Study

Statutory designated sites located within 5 km of the Development Site are considered in this assessment. Statutory designated sites are protected by EU and UK legislation and include:

- SPAs;
- Special Areas of Conservation (SAC);
- Ramsar sites;
- Sites of Special Scientific Interest (SSSI);
- National Nature Reserves (NNR); and
- Local Nature Reserves (LNR).

The statutory sites designated for nature conservation are presented in Table 3.1.

Table 3-1: Designated Sites

Site Name	Designation	Proximity to Development Site (km)	Qualifying Feature
River Teith	SAC	0.2 km North	Designated on account of its Atlantic salmon <i>Salmo salar</i> and river, brook and sea lamprey <i>Lampetra fluviatilis</i> , <i>L. planeri</i> and <i>L. marinus</i> populations.
Kippenrait Glen	SAC/SSSI	3.2 km North East	SAC: Designated for its mixed woodland habitat. SSSI: Notified on account of its mixed ash woodland habitat and on account of its beetle and crane fly <i>Lipsothrix ecucullata</i> populations.
Ochertyre Moss	SSSI	3.4 km North West	Notified on accounts of its raised bog habitat and on account of its spider <i>Heliophanus dampfi</i> population.
Abbey Craig	SSSI	3.4 km East	SSSI: Notified on account of its mixed ash woodland habitat and on account of its beetle population.
Sauchie Craig Wood	SSSI	3.5 km South	SSSI: Notified on account of its mixed ash woodland habitat.
Balquhiderock Wood	SSSI/LNR	4.3 km South East	Notified for its wet woodland habitat.

In addition to the above a search for areas of woodland listed on the Ancient Woodland Inventory (AWI) was undertaken within 1 km of the Development Site.



3.1.1 Desk Study Results

Protected Mammal Species

The NBN Atlas database has no records of protected mammal, reptile and amphibian species within the Site within the last five years. However, there are records of the following protected species within 5 km of the Site:

- Beaver *Castor fiber*;
- Otter *Lutra lutra*;
- Common pipistrelle bat *Pipistrellus pipistrellus*;
- Soprano pipistrelle bat *Pipistrellus pygmaeus*;
- Badger *Meles meles*;
- Red squirrel *Sciurus vulgaris*; and
- Pine marten *Martes martes*.

3.2. Fieldwork

3.2.1 Site Habitats

The northern section of the site comprises the Lomond View Building and associated car park. Semi-natural habitats present within the northern area of the site comprise lines of standard trees, most notably a group of standard oak *Quercus sp.* trees, which are very mature in nature (Target note 9). An area of rank marshy grassland lies to the north west of the car park, beyond which lies the River Forth. A small pond lies in the west of the northern section of the site (Target Note 7), however this feature was choked with great reedmace *Typha latifolia* and held little to no standing water at the time of survey.

The central section of the site comprises a series of buildings and hardstanding associated with the Prudential financial services company. Craigforth House, which is currently used as a nursery, also lies within this section, along with two residential bungalows. Semi-natural habitats in this section comprise a line of standard lime trees *Tilia cordata* associated with the road which runs through the site and small areas of amenity grassland.

A small section of woodland lies in the central section, which is part of the wider woodland that lies around the crag, which is encapsulated between the central and southern section of the site. This woodland is listed on the Ancient Woodland Inventory as 'Long Established Woodland of Plantation Origin' (LEPO). The 'Crag Woodland' comprises a canopy formed by a range of native and ornamental species including sycamore *Acer pseudoplatanus*, Corsican pine *Pinus nigra*, sitka spruce *Picea sitchensis*, pedunculate oak *Quercus robur*, horse chestnut *Aesculus hippocastanum*, silver birch *Betula pendula* and alder *Alnus glutinosa*. The understorey, where present comprises smaller growing tree species such as holly *Ilex aquifolium* and rowan *Sorbus aucuparia*, along with patches of rhododendron *Rhododendron ponticum* and bramble *Rubus fruticosus* agg scrub. The ground flora comprises a range of grasses such as brome *Bromus sp*, ferns and patches of bluebells *Hyacinthoides non-scripta*, wetter areas at the edge of the woodland also contain great reedmace.

The southern section of the site largely comprises farmland which is being managed for arable purposes and a silage crop associated with Kaimes Farm. A hedgerow comprised largely of



snowberry *Symphoricarpos albus*, separates this section of the development site from the crag woodland.

The western boundary of all three sections of the Development Site is largely comprised by the River Forth. The river channel meanders naturally along the boundary and is varies between 10-15 m in width. The water is deep and slow flowing in this section of the River Forth. There is abundant bankside cover provided by riparian woodland, which largely comprises alder, sycamore, ash *Fraxinus excelsior* and cherry *Prunus* sp. trees. Between the trees invasive flora is abundant in the form of giant hogweed *Heracleum mantegazzianum* and Himalayan balsam *Impatiens glandulifera*.

Bird Walkover Survey

The bird species recorded during the survey are presented in Table 3.2.

Table 3-2: Bird Sightings

Species	Species	Species
Black-headed gull <i>Chroicocephalus ridibundus</i>	Grey heron <i>Ardea cinerea</i>	Pied wagtail <i>Motacilla alba</i>
Buzzard <i>Buteo buteo</i>	Goosander <i>Mergus merganser</i>	Reed bunting <i>Emberiza schoeniclus</i>
Blackcap <i>Sylvia atricapilla</i>	Great tit <i>Parus major</i>	Robin <i>Erithacus rubecula</i>
Blue tit <i>Cyanistes caeruleus</i>	House martin <i>Delichon urbicum</i>	Sedge warbler <i>Acrocephalus schoenobaenus</i>
Chaffinch <i>Fringilla coelebs</i>	House sparrow <i>Passer domesticus</i>	swallow <i>Hirundo rustica</i>
Chiffchaff <i>Phylloscopus collybita</i>	Mallard <i>Anas platyrhynchos</i>	Willow warbler <i>Phylloscopus trochilus</i>
Goldfinch <i>Carduelis carduelis</i>	Oystercatcher <i>Haematopus ostralegus</i>	Wren <i>Troglodytes troglodytes</i>

3.2.2 Mammal Walkover Survey

Mammal Species Signs/Sightings

However, some of the habitat types present do have the potential to support such species and this is described in Table 3.3.



Table 3-3: Protected Mammal Habitat Suitability

Species/Guild	Evidence Recorded	Preferred Habitat Types*	Habitat Suitability (Works Area)
Otter and water vole	No evidence of these species was recorded within the survey area.	<p>Otter: Found at rivers, small streams, ditches, ponds, lakes, canals, marshes, rocky shores and estuaries. May rest and rear young within tree roots, holes in river banks, rocks or flattened areas of vegetation. Old and fallen trees in woodland provide holt sites and woodland understory vegetation offers cover above ground.</p> <p>Two main factors need to be considered: food supply and pollutants.</p> <p>Water Vole: Mainly on vegetated banks of slow flowing rivers, ditches, dykes and lakes. Excavate extensive burrow systems into the banks of waterways.</p>	<p>Otter: Due to access issues, searches were restricted to the east bank of the watercourse only, with a detailed search of the west bank undertaken with the aid of binoculars. Despite no evidence of the presence of otter recorded at the time of survey, the River Forth offers excellent foraging conditions for otter and they will use the channel for commuting also. The habitats within the survey area are subject to high levels of recreational use from the staff that work at Craigforth, and as such, it is considered unlikely that otters would rest in the survey area for any length of time.</p> <p>Water Vole: No evidence of water vole was recorded during the survey. The watercourses within the survey area are of limited suitability for this species, being typically too substantial and lacking in bankside burrowing opportunities.</p>
Badger	No evidence of this species recorded within the survey area.	Typically a patchwork of pasture and woodland providing good areas for earthworms and foraging, as well as good areas for setts. Setts have, however, been found in unusual areas such as railway and road embankments, open fields and under buildings.	There is good woodland coverage within the Crag, and reasonable foraging opportunities in the farmland in the south of the Development Site. The Development Site is however, cut off from other suitable habitat via the M9 to the east and the River Forth to the west, limiting opportunities for colonisation by this species.
Red Squirrel and Pine Marten	No evidence of these species recorded within the survey area.	<p>Red squirrel: Typically build dreys in the forks between tree trunks and branches in coniferous and mixed woodland.</p> <p>Pine marten: Dens mainly in woodland in hollow trees or scrub-covered fields. Occasionally house roofs, rabbit burrows, rocky outcrops or under tree roots.</p>	Sub-optimal habitat for these species exists in Crag Wood. However, this woodland is isolated from other suitable habitat by the presence of the River Forth and the M9 carriageway on the Western and Eastern boundaries.



Species/Guild	Evidence Recorded	Preferred Habitat Types*	Habitat Suitability (Works Area)
Bats		<p>Foraging - waterways, woodland or grassland.</p> <p>Commuting – linear features such as woodland edges, hedgerows, rivers, tree-lined paths.</p> <p>Roosting – trees, caves, buildings including barns, houses, tunnels and bridges.</p>	<p>Craigforth House is an old building of stone construction and is considered to be of high roosting potential for bats. There are numerous potential ingress points for bats via cracks in the render/stonework, around the chimney masonry, and through lifted slates and flashing on the roof. The remainder of the buildings within the site are all of low or negligible potential for supporting roosting bats. The mature standard oak trees (Target Note 6) have been identified as having moderate potential to support roosting bats. The woodland habitat within the Development Site also provides excellent foraging and commuting opportunities for this group (Target Note 2), as do linear features such as the line of lime trees along the main road within the Business park and riparian woodland edge (Target Notes 1 and 4).</p>
Herpetofauna	No sightings recorded.	<p>Amphibians: Water bodies and swamps during their breeding phase and rank vegetation, scrub and marsh vegetation during their terrestrial non breeding phase.</p> <p>Reptiles: Edge habitats, rank grasslands and scrub areas. Also, coastal dune and heathland habitats. South facing slopes for basking. Log piles, stone walls and compost heaps during hibernation.</p>	<p>Amphibians: The choked small pond and marshy grassland will likely support common amphibian species such as common frog and toad. But the habitats are considered to be of little to no suitability for supporting the protected species, great crested newt. This species is not considered further in this report.</p> <p>Reptiles: The habitats present within the site largely comprise hard standings and areas of well-managed, close clipped vegetation (save for Crag Wood). As such they are of little suitability for supporting common reptile species.</p>

**Habitat definitions adapted from the SNH and Natural England websites*

Invasive species

Two invasive vascular plant species listed on Schedule 9 of the Wildlife and Countryside Act were recorded during the survey visit. Giant hogweed was recorded at the western edge of the car park in the central section of the site (Target Note 3), along the River Forth on the western boundary of the site (Target Note 5) and in the rank marshy grassland in the northern section of the site (Target Note 14). Himalayan balsam was also recorded along the banks of the River Forth (Target Note 3).



4. APPRAISAL AND RECOMMENDATIONS

4.1. Assessment Methodology

If the development be screened as requiring an Environmental Impact Assessment (EIA) an assessment of the effects of each ecological receptor should be undertaken based on the guidance set out by the Chartered Institute of Ecology and Environmental Management (CIEEM, 2018).

4.2. Designated sites

The River Teith SAC lies approximately 200 m to the north of the Development Site at its closest point. As mentioned in Table 3-1 the SAC is designated for its Atlantic salmon and lamprey populations.

There are no barriers preventing the dispersal of the SAC qualifying species moving upstream into the section of the River Forth which forms the site boundary. Having said that, this section of the River Forth is considered to be of relatively low sensitivity for these species as there is a lack of spawning gravel, or marginal fine sediment (used by lamprey to burrow into during their ammocoete phase).

Furthermore, there will be no stream crossings required as a result of the works, and no need for any instream works.

Prior to construction an Environmental Management Plan (EMP) will be prepared, which will contain a section setting out environmental commitments required when working near (within 10m of a watercourse). The EMP will set out measures for effective mitigation of silt and safe storage of potential pollutants.

Based on the above any adverse effect on the River Teith SAC resulting from the proposal is predicted to be extremely unlikely and it is considered that it should be possible to Screen the SAC out of the need for a Habitats Regulations Assessment.

The remaining designated sites are notified on account of their habitat and invertebrate populations and it is considered that they lie a sufficient distance from the Development Site where they will not be adversely affected by the proposals.

Ancient Woodland

A single area of woodland listed on the Ancient Woodland Inventory (AWI) lies within the site. Crag woodland is a long-established woodland of plantation origin (LEPO). There are no other areas of woodland listed on the AWI within 1 km of the development site. It is unclear at this stage if any of this habitat will be lost to the proposals, but it is recommended that it is retained where possible.

4.3. Bats

Further surveys are recommended to determine whether or not roosting bats will be affected by the works.

A break down of the buildings identified as requiring activity survey work (emergence/return surveys) is presented in Table 4-1.



All other buildings within the Development Site are considered to have negligible suitability to support roosting bats and require no further survey.

Should any trees require removal to facilitate the works it is advised that they are demarcated and surveyed separately to determine whether they have the potential to support roosting bats.

Bat activity transects are also being undertaken at the site. To date a single survey has been undertaken and with common and soprano bats being confirmed as using the Development Site. No other bat species have been recorded on site to date.

Table 4-1: Bat Activity Surveys

Species/Guild	Level of Bat Potential	Number of Activity Surveys Required	Number of Surveyors Required for Effective Coverage
Gatehouse building	Low	One	Two
Small brick building between Riverside Building and Administration Centre	Low	One	Two
Main/Central buildings	Low	One	Eight
Craigforth House	High	Three	Four
Dining Hall and Conference Centre	Low	Two	Four
Bungalow 1	Low	One	Two
Bungalow 2	Low	One	Two

4.4. Birds

A range of common bird species are considered to be breeding within the Development Site. The bird breeding season runs from April to August inclusive.

It is recommended that construction is timed to either avoid the breeding season altogether or Scheduled to start before the breeding season starts (ideally before mid-March) so that birds returning to the area to breed can choose a territory/nest location away from potentially disturbing activities.

4.5. General Mitigation Recommendations

The avoidance of adverse effects can also be achieved through good pre-construction planning, site practices, and adherence to relevant pollution prevention guidelines (PPGs) including:

- PPG1: General Guide to the Prevention of Water Pollution;
- PPG5: Works In, Near or Liable to Affect Watercourses;
- PPG6: Working at Construction and Demolition Sites.



Additionally, it is recommended that artificial lighting during construction and post construction is designed in such a way as to minimise light spill onto the River Forth. This is to safeguard otter, bats and fish from disturbance.

Finally it is recommended that any excavations are covered at the end of each working day or fitted with a mammal ramp to avoid animals becoming trapped.

5. REFERENCES

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