

Preliminary Ecological Appraisal &
Hedge Survey on Land off B5086 at
Arlecdon



Commissioned by: Mr S. Close

June 2018

To complete the objectives stated in this report, it was necessary for OpenSpace to base our conclusions on the best information available during the period of the project and within the limits prescribed by our client in the agreement. This report is guided by CIEEM Guidelines for Ecological Report Writing.

No investigative method can completely eliminate the possibility of obtaining partially imprecise or incomplete information. We therefore cannot guarantee that the investigations fully identified the degree or extent of e.g. species presence or habitat management efficacy described in this report.

Document Information

Client: Mr S Close

Address: Fleecy Ram,
47 Trumpet Road,
Cleator Moor,
Cumbria
CA23 3ED

Project: Arlecdon – Preliminary Ecological Appraisal & Hedge Survey

Document Ref: OP-Arlecdon–PEA18/01v1

Report Date: June 2018

Author(s): Diane Dobson (MCIEEM)

Report QA: Jonathan Rook

Report Revisions

Rev	Comment	Checked	Approved	Date
2	Final Draft	DD	DD	22/01/18
3	Final Draft QA	JR	JR	01/05/18
4	Final Draft Sent for Comments	DD	DD	01/05/18
5	Final Report Issued	DD	DD	26/06/18

CONTENTS

EXECUTIVE SUMMARY	III
PRELIMINARY ECOLOGICAL APPRAISAL AND HEDGE SURVEY FOR A PROPOSED RESIDENTIAL DEVELOPMENT ON LAND OFF THE B5086 AT ARLECDON.....	1
1 PROJECT BACKGROUND.....	1
2 SCOPE OF SURVEY	4
3 SURVEY METHODOLOGY	4
3.1 Preliminary Ecological Appraisal Survey	4
3.2 Hedge Survey	5
4 RESULTS AND ASSESSMENT	8
4.1 Site Location.....	8
4.2 Data Search – Designated Sites	8
4.3 Data Search– Protected Species and Species of Conservation Concern.....	9
4.4 Habitats	10
4.5 European Protected Species / Species of Conservation Concern	13
5 MITIGATION AND RECOMMENDATIONS	16
5.1 Habitats	16
5.2 European Protected Species / Species of Conservation Concern	19
5.3 Good Practice & Harm Avoidance.....	19
5.4 Enhancement Opportunities	20
6 SUMMARY	21
7 REFERENCES/BIBLIOGRAPHY	23
8 APPENDIX ONE: Photos.....	25
9 APPENDIX TWO: Legislation and Species Status	28
10 APPENDIX THREE: Phase 1 Habitat Map	29

FIGURES

Figure 1.1. Plan showing existing area	3
Figure 1.2. Plan showing indicative proposed development.....	3
Figure 3.1. Aerial map of the site (showing field survey area and proposed footprint)	7
Figure 3.2. Aerial map showing land within 2km from the site	8

EXECUTIVE SUMMARY

This report relates to a Preliminary Ecological Appraisal and Hedge Survey carried out on land proposed for a residential development adjacent to Arlecdon Parks Road, Arlecdon.

The damp semi-improved grassland and ruderal/scrub vegetation is of limited conservation interest in terms of the vegetation, with no impacts expected from their removal and no mitigation required.

The marshy grassland and species-rich neutral grassland are S41 Priority Habitats and would be of some conservation interest. However, the areas of these habitats are small. There is an opportunity to create a species-rich grassland area to offset the loss of these habitats.

Hedge H1 is not an “Important Hedge”, although it is a Priority Habitat under S41 and is considered to be of moderate conservation value. The removal of sections of Hedge H1 is considered to be of low to moderate impact. Mitigation measures will adequately reduce the impact. Recommendations on hedge protection have been provided.

The invasive plant species Montbretia is present on site. It will be necessary to ensure that this invasive species are managed correctly (if possible eradicated) and not spread on to other land because of the works.

There are habitats on site with some suitability for use by local populations of bats, birds and other species. **Recommendations on timing, methods, good practice and habitat enhancement have been provided in this report.**

All European protected species and species of conservation concern should be considered at all times during construction, and if individual animals are suspected or appear within the construction phase, works must stop and further guidance to protect from harm and disturbance should be sought by contacting an approved ecologist.

There is an opportunity to increase the biodiversity of the site. The proposed landscape plan to accompany a planning application should be produced in accordance with the National Planning Policy Framework (NPPF) in order to ‘minimise impacts on biodiversity and provide net gains in biodiversity where possible...’ and the local planning authority should take into account the policies contained in the Framework when making any decision. The proposed landscape features need to be created in a way that they are suitable for and will be used by wildlife. The proposed landscape plan should also use UK native species from reputable sources.

Preliminary Ecological Appraisal and Hedge Survey for a Proposed Residential Development on Land off the B5086 at Arlecdon

1 PROJECT BACKGROUND

The general walkover survey has been commissioned by Mr S. Close to provide general ecological information for an outline planning application for a proposed residential development on land adjacent to the B5086 in Arlecdon, Cumbria. As the proposal is for outline planning only, there are no plans available and the survey is for general reference only. The proposal is for up to seven/eight residential dwellings, with associated access and landscaping (see Figure 1.2).

To assess any potential impact from the proposed works a Phase One Habitat and European Protected Species (EPS) scoping survey has been undertaken. This aims to provide information on the presence of important habitats and the presence / potential for EPS or other species of principal importance on site. A hedgerow assessment has also been commissioned in order to provide information on the presence of any important hedgerows in relation to the hedgerow regulations. There may be a requirement to identify further survey work.

To ensure no offence is committed by disturbing protected species or disturbing other species of conservation concern while undertaking new construction projects, the survey examined evidence for a number of wildlife species with special protection from death, injury or disturbance. These are species listed under Schedule five and six of the Wildlife and Countryside Act, 1981 (as amended) and subsequent updates, and the Conservation (Natural Habitats, & c.) Regulations 2017.

The site was also assessed for other species and habitats with protection and interest, such those listed under Section 41 (S41) of the Natural Environment and Rural Communities (NERC) Act 2006. This recognises priority species to be of principal importance for the conservation of biodiversity and includes species such reptiles, invertebrates and breeding birds (including species under the EC Birds Directive) and habitats such as Purple Moor Grass and Rush Pasture (Marshy Grassland) and Lowland Mixed Deciduous Woodland.

Any species or habitats under the EC Birds or Habitats Directive are also covered by the Environmental Liability Regulations 2009, whereby operators are required to take preventative action in cases of imminent threat of environment damage, and to remedy environmental damage that they have caused. These Regulations apply in relation to:

- (a) damage to protected species and natural habitats if:
 - (i) it has significant adverse effects on reaching or maintaining the favourable conservation status of the protected species or natural habitat; and
 - (ii) it is caused by an activity listed in Schedule 1 or by the fault or negligence of an operator whilst carrying on any other activity.

This would include species such as all bat species, otter, salmon, birds such as merlin, hen harrier and kingfisher and habitats such as dry and wet heath and blanket bog.

See Appendix 2 for additional information on wildlife legislation and species status.

Figure 1.1. Plan showing existing area

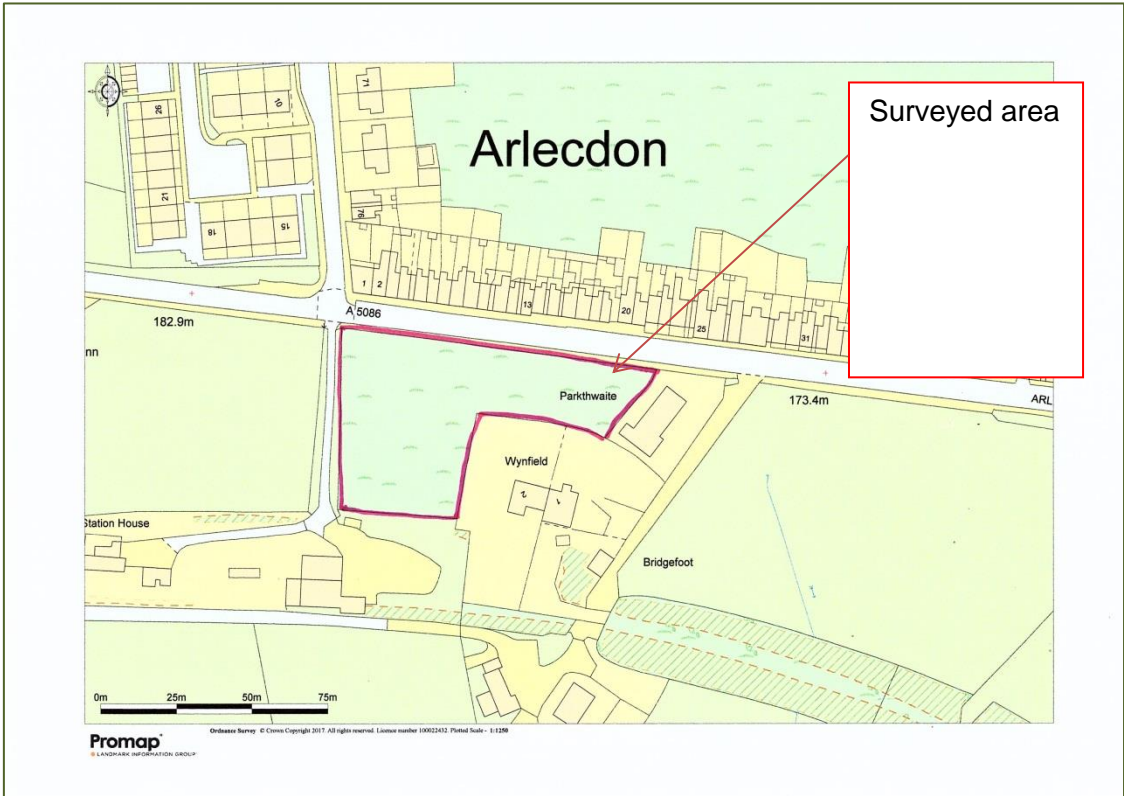


Figure 1.2. Plan showing indicative proposed development

TBC

2 SCOPE OF SURVEY

The survey aims to make a reasoned judgement as to the potential use of the site and adjacent habitat by European Protected Species and other species of conservation concern. The presence of any habitats of conservation concern will also be noted. From information gathered during a general walkover survey of the site, an assessment will determine the suitability of the habitat for protected species and note the potential conservation value of any habitats. Known habitat criteria for each protected species will form the basis for the assessment.

The hedge survey aims to make a reasoned judgment as to the importance of the hedges with consideration for their conservation and landscape value. The survey area (shown in Figure 1.1) considered the hedge along the northern boundary of the site. The hedgerow survey methodology followed the framework set by the Hedgerow Regulations 1997, using the guidelines published by DEFRA (2002).

This survey does not include a full ecological survey or detailed population studies. To provide this information other survey techniques would be required to provide data for an informed and balanced opinion.

3 SURVEY METHODOLOGY

3.1 Preliminary Ecological Appraisal Survey

The survey area incorporated the site and the site boundaries. Where possible, adjacent land was also assessed / surveyed (see Figures 1.1 and 3.1).

The land and habitat within and surrounding the site were assessed for potential to support protected and important species and any signs or potential features were noted. The survey method involved a visual investigation within the proposed area, site boundaries and an assessment of adjacent land, and any hedgerows and trees.

Areas that could not be accessed were assessed for potential by observations made during the surveys and from information gathered during the desktop study. During a desktop study, aerial photographs and OS maps were used to look for water bodies and other features in the surrounding 500m. The desktop study incorporates the use of Quantum GIS software and the Natural England MAGIC website for analysis of proximity to designated sites and mapping purposes, including analysis of the data search.

A full Phase 1 Habitat survey (JNCC, 1990) was conducted. This was undertaken in the month of January, which is during the sub-optimal time of year; however, most plant species are still present. The survey identifies habitat types and the boundaries between these. Plant species nomenclature follows that of Stace (2010). On completion of the field survey, the field notes were generated into a final report map with final target notes (see Appendix Three for Phase 1 Habitat Map).

3.2 Hedge Survey

Some hedges may qualify as 'important hedges' under the Hedgerow Regulations (1997), requiring consent from the local authority for their removal. Species-rich hedges that do not qualify as 'important hedges' could qualify as a UKBAP Priority Habitat under the definition for hedges that have more than 80% native species. Hedges that qualify under the Regulations or UKBAP Priority Habitats are likely to be of conservation importance.

Hedgerows classified under the Hedgerow Regulations include those on or adjoining common land, village greens, Sites of Special Scientific Interest, National Nature Reserves, Special Protection Areas under the Birds' Directive, Special Areas of Conservation under the Habitats' Directive, Local Nature Reserves or land used for agriculture, forestry or breeding or keeping horses, ponies or donkeys. Garden hedges and hedges around industrial developments are excluded from the Hedgerow Regulations 2007.

Hedgerows which fall within one of the following criteria are classified as 'important' in the context of the Hedgerow Regulations. These hedgerows would require consent for removal under the Hedgerow Regulations other than where the removal is part of development for which planning permission has already been granted. Definitions used are as those given in the Hedgerow Regulations (1997).

The following criteria are used to assess the importance of a hedge:

A. The hedgerow contains protected flora and/or fauna.

B. The hedgerow includes:

- At least 7 woody species; or
- At least 6 woody species and has 3 associated features; or
- At least 6 woody species including Black Poplar, a Large-leaved lime, a Small-leaved Lime or a Wild Service Tree; or
- At least five woody species and has at least four associated features.

C. The hedgerow is

- Adjacent to a road, bridleway, footpath, road used as a public footpath or a byway open to all traffic and
- Includes at least four woody species and has at least two associated features.

Associated features recorded are as follows:

- A bank or wall for at least half the length of the hedgerow.
- A ditch for at least half the length of the hedgerow.
- Gaps over no more than 10% of the length of the hedgerow.
- At least one standard tree per 50m of hedgerow.
- At least three woodland species in the ground flora as defined in Schedule 2 of the Regulations within 1m from the outermost edges of the hedgerow.
- Connections scoring four or more points, where connection a hedgerow counts as one, and connection to a woodland, in which the majority of the trees are broad-leaved, or a pond counts as two.
- A parallel hedge within 15m of the hedgerow.

Regional variations: The number of woody species required is reduced by one for hedgerows situated wholly or partly in a number of counties, of which Cumbria is one.

Data search

The survey employed the services of the local biological records centre at Tullie House Museum (Cumbria Biodiversity Data Centre) to provide historical data. It must be noted that the species records are not comprehensive. Any lack of a record does not necessarily constitute an absence of a species from the surveyed area.

Timing

The survey was conducted on 22nd January 2018 between the hours of 9.00 and 11.00am.

Weather conditions

Temperature 6-8 °C; cloud cover 90%; Wind SW 2-3; scattered showers.

Personnel

The survey was undertaken by Diane Dobson (B.Sc., M.Sc., MCIEEM). Diane is an experienced ecologist with over 12 years' experience in conducting PEA surveys (formerly Phase One Habitat and Scoping Surveys).

Figure 3.1. Aerial map of the site (showing field survey area and proposed footprint)



Figure 3.2. Aerial map showing land within 2km from the site



4 RESULTS AND ASSESSMENT

4.1 Site Location

The proposed development site is located on the southern edge of the village of Arlecdon, west Cumbria. The site is immediately bordered by the B5086 to the north, residential dwellings and a farm to the east and south and a lane to the farm on the west.

The wider landscape comprises the villages of Arlecdon and Rowrah to the north and east, the town of Frizington about 1.3km to the southwest and agricultural land, with streams, areas of woodland and disused quarries with standing water also present.

See Figure 3.1 and 3.2 for aerial photograph of the site and surrounds.

4.2 Data Search – Designated Sites

Internationally and Nationally Designated Sites

The following statutory sites are present within 5km from the proposed development site:

- River Ehen (Ennerdale Water to Keekle Confluence) Site of Special Scientific Interest (SSSI) / River Ehen Special Area of Conservation (SAC) located about 2.5 km to the south.
- River Derwent (River Derwent and Tributaries SSSI/River Derwent and Bassenthwaite Lake SAC) located about 2.3km to the northeast
- Yeathouse Quarry SSSI located about 1.8km to the southwest.
- High Leys SSSI/NNR located 1.1km to the southeast.
- Boundary of the Lake District National Park located 2.6km to the south.

The proposed development falls within the Natural England SSSI Impact Risk Zone for the River Ehen (Ennerdale Water to Keekle Confluence) SSSI / River Ehen SAC and High Leys SSSI. However, the proposed 'Residential Development' is for up to eight dwellings, which is below the threshold for Residential Developments (MAGIC, 2017). Therefore, there is no requirement to consult Natural England.

Local Wildlife Sites

There are no local wildlife sites within 2km of the proposed development site.

4.3 Data Search– Protected Species and Species of Conservation Concern

Species recorded within 2km include (all are within 1-2km of site unless otherwise noted):

- Otter *Lutra lutra*: 4 records all over 1km away.
- Red squirrel *Sciurus vulgaris*: 44 records, the nearest about 400m away.
- Hedgehog *Erinaceus europaeus*: 11 records, the nearest about 200m away in Arlecdon.
- Bats, including common pipistrelle *Pipistrellus pipistrellus*, Soprano pipistrelle *Pipistrellus pygmaeus* and brown long-eared bat *Plecotus auritus*: 9 records, including 7 records for bat roosts (2for maternity roosts), all over 1km away.
- Eurasian badger *Meles meles*: 2 records about 700m away.
- Brown hare *Lepus europaeus*: 5 records, all over 1km away.
- Polecat *Mustela putorius*: 1 record over 1km away.
- Common Lizard *Zootoca vivipara*: 3 records about 1.7km away.
- Adder *Vipera berus*: 7 records about 1.7km away.
- Common toad *Bufo bufo*: 5 records, the nearest being 1.3km away.
- Great Crested newt *Triturus cristatus*: 1 record, approximately 1.8km away.
- Atlantic Salmon *Salmo salar*: 2 records over 1km away.

There are a number of records for rare, notable, scarce or protected species (Cumbria Key Species, species under S41 of NERC, notable species and Red List species) of invertebrate within 2km of the proposed residential development site.

The Cumbria Biodiversity Data Centre holds a number of historical records for bird species recorded in the area. These include 111 records for 11 'sensitive species', 491 records for 26 red list species and 364 records for 28 amber list species.

The 'sensitive' status refers to a record for a nationally or locally sensitive species, 'Red List' species are those that are Globally Threatened according to IUCN criteria; those whose population or range has declined rapidly in recent years; and those that have declined historically and not shown a substantial recent recovery. Amber List species are those with an unfavourable conservation status in Europe; those whose population or range has declined moderately in recent years; those whose population has declined historically but made a substantial recent recovery; rare breeders; and those with internationally important or localised populations.

4.4 Habitats

The site comprises a field consisting of damp semi-improved grassland and ruderal vegetation, with hedges and fences for boundaries (See Figure 1.1 and 3.1).

See Appendix Three for the Phase 1 Habitat Map.

Grassland

The main habitat recorded in the field comprises a fairly species-poor damp semi-improved grassland. The sward is dominated by Soft Rush *Juncus effusus* and grasses, such as Yorkshire Fog *Holcus lanatus*, Red Fescue *Festuca rubra*, Creeping Bent *Agrostis stolonifera*, Crested Dog's-tail *Cynosurus cristatus*, Common Bent *Agrostis capillaris* and Perennial Rye-grass *Lolium perenne*. Forbs include Creeping Buttercup *Ranunculus repens* and Cuckooflower *Cardamine pratensis*. There are small patches of more species-rich marshy grassland, with Common Sedge *Carex nigra*, Greater Bird's-foot Trefoil *Lotus pedunculatus*, Meadow Buttercup *Ranunculus acris*, Common Sorrel *Rumex acetosa* and Ribwort Plantain *Plantago lanceolata*.

There is a small area of species-rich semi-improved neutral grassland in the east of the site, where forbs are frequent, such as Ribwort Plantain, Yarrow *Achillea millefolium*,

Common Knapweed *Centaurea nigra* and Meadow Vetchling *Lathyrus pratensis*, along with the sedge Glaucous Sedge *Carex flacca*.

Ruderal/Scrub Vegetation

Three areas of ruderal and scrub vegetation, mostly consisting of Bramble *Rubus fruticosus*, Creeping Thistle *Cirsium arvense*, Rosebay Willowherb *Chamerion angustifolium* and Nettles *Urtica dioica* were mapped. Scattered scrub in the form of Brambles was present throughout the field.

There are small stands of Montbretia *Crocasmia x crocosmifolia* in the east of the site. Montbretia is listed under Schedule 9 to the Wildlife and Countryside Act 1981 with respect to England and Wales. As such, it is an offence to plant or otherwise allow this species to grow in the wild.

Hedges

Hedge H1 located along the northern boundary of the site connects to one other hedge and borders the road. This hedge is about 100m long, with over 80% native species and is situated on a bank. The hedge has less than 10% gaps and no standard trees. Two native woody species are present, these being Hawthorn *Crataegus monogyna*, the dominant species and a small amount of Blackthorn. The ground flora has three woodland species, these being Male Fern *D. filix-mas*, Hart's-tongue Fern *Asplenium scolopendrium* and Wood Avens *Geum urbanum*.

There appears to be a field boundary present in the location of Hedge H1 in 1867 as seen from the OS map (Historical Mapping, 2017), and appears to have been marked as a hedge, though if the B5086 has been widened since then, it likely that the hedge has been replanted.

Other hedges are present along the eastern and southern boundaries. However, these hedges are within curtilage and are largely introduced or not local species.

Invasive Plant Species

There are small stands of Montbretia *Crocasmia x crocosmifolia* in the east of the site (TN 5 and 6). Montbretia is listed under Schedule 9 to the Wildlife and Countryside Act 1981 with respect to England and Wales. As such, it is an offence to plant or otherwise allow this species to grow in the wild.

Assessment

General Habitats

The damp semi-improved grassland and ruderal/scrub vegetation are of low conservation interest, with no impacts expected on their removal and no mitigation required in terms of the vegetation.

The marshy grassland and the species-rich semi-improved grassland would be categorised as priority habitats under Section 41 Purple Moor-grass and Rush Pasture and Lowland Meadows respectively. However, the areas of these habitats are small and therefore the conservation interest would be low. As these are priority habitats, there is an enhancement opportunity to create an area of species-rich grassland within the proposed development to offset the loss of these habitats.

Hedges

Hedge H1 along the north-western boundary has only two native woody species present, and therefore do not qualify under ecological terms as 'important' in the context of the Hedgerow Regulations. However, the field boundaries may pre-date the Enclosures Act (1845 – the earliest of the Acts), which indicates that the hedgerows may have been an integral part of the field system pre-dating this Act. The local planning authority can be contacted for information on the historic status of the hedges. If a hedge pre-dates the enclosures act this would qualify as 'important' in the context of the Hedgerow Regulations and would require consent from the local planning authority for any removal.

Hedge H1 has over 80% native species along its length and therefore meets the criteria under the Priority Habitat for hedges. The hedge appears to be maintained by cutting (roadside hedges) and this reduces potential berry production. However, the hedge may offer some breeding bird potential and provide a wildlife corridor from the proposed development site to the surrounding habitat.

Hedge H1 is considered to be of moderate conservation value. The proposal is to remove sections of Hedge H1 to allow access for each of the dwellings and for visibility splays. As the proposed plans are for outline only it is not known the lengths of hedgerow requiring removal.

Any plans to remove more of Hedge 1 should consider the impact and allow for appropriate mitigation. However, it is expected that most of the hedge will require removal

and the proposed development is considered to have a low to moderate impact, without mitigation. If appropriate mitigation measures are undertaken the impact is considered low (Section 5.1 provides mitigation measures).

There are other hedges within curtilage around the site boundary. However, there are no plans to remove any of these hedges, with no direct impacts expected.

There may be an impact on the hedge roots of retained hedges from the proposed development and mitigation measures should be put in place.

Invasive Plant Species

There is Montbretia within the survey area. The proposed works are likely to disturb areas with Montbretia and it will be necessary to ensure that this invasive species is contained and not spread to other areas in accordance with current legislation. **See Section 5.1 for information on control measures.**

4.5 European Protected Species / Species of Conservation Concern

Bats

There are nine records for bats, including seven records of roosts, within 2km. There are no buildings on site and the two trees within the proposed development site are young and offer negligible potential for roosting bats. There is no potential for bats to roost on site.

The habitat surrounding the site offers suitable conditions for foraging and commuting bats. The hedgerows along the site boundary provide some suitable corridors for commuting bats. The removal of most of the northern hedge will result in a loss of connectivity and it is recommended that hedge planting be undertaken to reduce the loss of this connectivity. The grassland that covers the majority of the site offers limited foraging conditions for bats.

During any proposed development, there may be low risk of disturbance to the local bat population using the site to forage and commute. Increased lighting across the site may have a low negative impact on local populations (foraging and commuting bats). Good lighting design will reduce indirect effects.

The proposal may provide an opportunity to improve the site for local populations of bats (see recommendations in Sections 5.2 and 5.4).

Badger

There are two records for badger within 2km of the site, though both were recorded over 1.5km away. There were no badger setts or other signs of badger observed within the proposed field survey area. There is limited scope for badger setts within the land immediately adjacent to the site (30m radius).

The field provides suitable habitat for foraging badger and the surroundings provide good connectivity for this species.

The proposed development will have nil/negligible impact on local badger setts or populations. However, as badgers have been recorded in the general area, appropriate avoidance measures should be adhered to reduce any low risk of impact on individual animals (see recommendations in Section 5.3).

Breeding Birds

The hedges within the field survey area provide suitable provisions for local populations of breeding birds, with the two trees having negligible potential being small and isolated. The damp semi-improved grassland covering the majority of the surveyed site provides low potential for breeding birds, with the scrub vegetation providing some potential. There are numerous records for bird species within 2km.

There was no provision for barn owl *Tyto alba* to breed / roost within the field survey area. The grassland on site provides some potential for barn owl to hunt, as there were good cover and extensive feeding signs of field/bank vole. There is a record for barn owl in Arlecdon and it is likely the field forms part of the hunting range for barn owl. However, there is no mitigation required for barn owl.

There may be risk of impact on breeding birds should vegetation clearance be undertaken during the bird-breeding season (March-August). See Recommendations in Sections 5.2 and 5.3. There will be some loss of potential feeding area for barn owl. Retention of some of this habitat or habitat creation will reduce the loss of this area.

Red Squirrel

There are 44 records for red squirrel within 2km radius of the site. The trees on site have nil/negligible potential for breeding and nesting red squirrel, as they are young and relatively isolated from the woodlands / parklands where red squirrel have been recorded.

The proposed development will not impact on red squirrel or squirrel dreys. The hedges may be used by commuting red squirrel. It would be good practice to consider planting native hedges to offer new connectivity for red squirrel. There is low risk of disturbance / injury to individual animals during general construction / vegetation clearance works. Adopting good practice and avoidance measures (Section 5.3) would reduce any risk of impact.

Other European Protected Species / Species of Conservation Concern

The hedges and grassland provide suitable conditions for commuting and foraging hedgehogs. The hedges and scrub provide some habitat for breeding/nesting/hibernating hedgehog. The hedges, scrub and grassland provides limited suitable habitat for brown hare and polecat.

The proposed development works are unlikely to impact on local hedgehog, brown hare, or polecat populations. There is low risk of disturbance / injury to individual animals during general construction / vegetation clearance works. Adopting good practice and avoidance measures (Section 5.3) would reduce any risk of impact.

The following protected species are not expected to be significantly impacted by the proposed development due to the site not providing suitable habitat and/or no connectivity and/or no records within 2km of the site:

- great crested newt (and other amphibians) (no potential breeding ponds within 500m).
- otter (no freshwater habitats on or adjacent to the site).
- pine marten (not known in the area and limited connectivity).
- dormouse (no suitable habitat on site and not known in the area).
- water vole (no freshwater habitats on or adjacent to the site).
- natterjack toad newt (no suitable breeding habitat, not near the coast and no potential breeding ponds within 500m).

- reptiles (some suitable terrestrial habitat and refugia on site but very limited connectivity to other suitable habitat and known populations).
- aquatic species such as freshwater fish, pearl mussel and white-clawed crayfish (no freshwater habitats on or adjacent to the site).

The risk of any of the above species being present within the proposed development site is considered negligible and no mitigation measures are required.

Invertebrates

The loss of hedges, grassland and ruderal vegetation across the site may impact on important invertebrate populations, if present. The proposed landscape design could provide opportunity to enhance the site for the important invertebrate populations and mitigate for any habitat loss (see Section 5.4).

5 MITIGATION AND RECOMMENDATIONS

5.1 Habitats

General Habitats

To off-set the loss of habitats there is an opportunity to enhance the site for biodiversity by planting UK native species. All plants should be from reputable sources that are suitable for the site location and habitat and areas shown within the proposed landscape plan (OpenSpace can offer a suggested planting list). This could include the creation of marshy grassland area or species rich grassland. These habitats will benefit species such as barn owl.

Hedges

The proposal is to remove sections of Hedge H1 to allow access for each of the dwellings and for visibility splays. As the proposed plans are for outline planning only it is not known the lengths of hedgerow requiring removal. The proposed mitigation would be to remove the hedge section outside of the bird-breeding season and undertake mitigation native species-rich hedge planting, replanting the same length of hedgerow to that lost.

The landscape plan should consider planting a new native species-rich hedge along the western boundary of the proposed development and around the dwellings. The hedge should consider using native tree and hedge species.

No building footprint or large construction machinery should enter within 3m of the retained hedges. If during the project construction machinery must incur in to the 3m zone, this report recommends large wooden boards are placed around the area to reduce compaction. If necessary appropriate fence protection should be installed before construction to restrict access to the root systems.

The hedge mitigation proposals should be as follows:

1. All hedge removal on site should be undertaken outside the bird-breeding season, or if hedges are removed within the bird-breeding season, a detailed bird nest survey must be undertaken before works commence.
2. A buffer of 3m between any building footprint / excavation works and base of retained hedges should be applied.
3. If the proposed development construction zone is within 3-4m of the hedge then large wooden boards should be placed around the area to reduce compaction. Appropriate fence protection should be installed before construction to restrict access to the root systems.

Planting recommendations would include:

1. Hedge planting to use UK native species and will link in with the existing hedges.
2. The hedge will be 60cm wide, planted on a double row with six plants per linear metre.
3. Apply kerb herbicide to hedge bottom to restrict first year weed growth. Allow for weeding 12 months after planting.
4. Ensure hedge and tree planting is maintained and watered in the summer.
5. Apply wood mulch around hedge and tree bottoms to reduce weeds further and provide some mulching effect.
6. Enhance retained hedgerows by planting native species and native ground flora.

Native hedge and tree species to be planted:

- Hawthorn (*Crataegus monogyna*)
- Elm (*Ulmus minor var. vulgaris*)
- Hazel (*Corylus avellana*)
- Holly (*Ilex aquifolium*)
- Elder (*Sambucus nigra*)
- Bird Cherry (*Prunus padus*)
- Rowan (*Sorbus aucuparia*)

- Guelder Rose (*Viburnum opulus*)
- Dog Rose (*Rosa canina* agg.)
- Honeysuckle (*Lonicera periclymenum*)

Invasive Plant Species

There are small areas Montbretia in the east of the site. It will be necessary to ensure that this invasive species is managed correctly (if possible eradicated) and not spread on to other land because of the works. A management or eradication plan should be produced for the management and control of the invasive plant species.

The Infrastructure Act 2015 Part 4 Section 23 gives the relevant environmental authorities in England and Wales the power to issue species control orders. These orders will make it possible to compel landowners or occupiers to carry out control or eradication operations, or allow them to be carried out by the issuing authority. The orders may be issued only: - when it has been impossible to reach an agreement with the owner or occupier or action is urgently required, and where the plant has been identified as both “invasive” (a serious threat to biodiversity, the economy or other social or economic interests) and “non-native” or “no longer normally present in Great Britain”.

The stands of Montbretia must be eradicated in a controlled way following legislation guidelines, so as not to spread the plant (Montbretia largely spreads by rhizomes/corms). There are a number of sources of guidance on Montbretia from the GB non-native species secretariat and Environment Agency websites. Montbretia eradication options include herbicide treatment, excavation to landfill and on site burial. Physical control of montbretia is difficult as the corms break easily and can result in ready re-infestation or further spread. Where infestations are limited in extent, the entire stand can be excavated and buried at a depth of at least 2m, incinerated or disposed of to licensed landfill. The corms are very hardy and are not suitable for composting. Due to the potential for reinfestation from corms, regular follow-up will be required over a period of at least 2 years to deal with any regrowth.

Any waste soil that may contain fragments of Montbretia and/or seed is classified as controlled waste and must be treated as such and that is sent for landfill either before or after any treatment, must go to a landfill that is authorised to receive it.

5.2 European Protected Species / Species of Conservation Concern

Breeding Birds – Timings & Methodology

It is recommended that vegetation clearance be undertaken outside the bird-breeding season. Should clearance works commence within the bird-breeding season (March to August inclusive) then tree or hedge removal must consider breeding birds and inspect for bird nests before removal. It is recommended this is undertaken by a suitably qualified ecologist or Ecological Clerk of Works (watching brief).

Any feature containing a nest must not be destroyed or disturbed until the young have fledged.

5.3 Good Practice & Harm Avoidance

Bats

The building design, to follow good practice, should employ a good lighting design to minimise light impact on bats. External lighting within the developed site could aim to be minimal with suggestions provided below.

- Use of energy efficient and modern security lighting - narrow spectrum lights, low pressure sodium or warm white LEDs.
- The design of the luminaire should incorporate the use of hoods, cowls, louvers and shields to direct the light to the intended area only.
- Reducing the ecological impact of the light by directing the light at a low level, preferably an angle less than 70 degrees.

There is the opportunity to enhance the site for bats by providing roost provisions, such as installing bat boxes to new buildings. Also, landscaping works can enhance the site for bats; for example, planting native hedges will provide greater foraging opportunities and wildlife corridors for commuting.

General

Adherence to the following awareness measures will ensure that any low risk of disturbance to individual amphibian, brown hare, hedgehog and other individual animals will be reduced:

- Before clearance works commence, any areas covered by dense vegetation should be disturbed by hand (or by the contractor walking over and disturbing the ground cover) to alert any animal.

- Tree / hedge removal should retain the stumps and vegetation at ground level – these areas should be cleared with care - following a fingertip search at least three days after the main body of the hedge has been removed.
- Equipment, tools or plant associated with the development should be secured, stored away for the overnight period.
- Any open pipes at the end of each working day should be capped off (or stopped) to prevent access to hedgehog and other small mammals.
- All open excavations left overnight should allow any animal a means of escape if they enter the excavation. This can be achieved by placing a wooden board or plank no less than 0.5m wide and at an angle of no more than 45° or have a similar soil slope in the excavation.
- Open excavations should be checked daily before commencing works.
- All construction materials are to be stacked safely to prevent accidental collapse.
- To prevent the encouragement of pests and scavengers no food wastes are to be deposited on site.
- Works should, where possible, reduce working around sunrise and sunset.
- During works, any lighting on site should be minimal and directed away from the surrounding trees / hedgerows.

5.4 Enhancement Opportunities

There is an opportunity to increase the biodiversity of the site. The proposed landscape plan should be produced in accordance with the National Planning Policy Framework (NPPF) in order to 'minimise impacts on biodiversity and provide net gains in biodiversity where possible...' and the local planning authority should take into account the policies contained in the Framework when making any decision. The proposed landscape features need to be created in a way that they are suitable for and will be used by wildlife. The proposed landscape plan should also use UK native species from reputable sources.

The following enhancement measures are suggested:

- Bird boxes could be included within the scheme. House sparrow, swallow and swift nest boxes can be attached / incorporated into the buildings' design.
- Bird feeders and open water areas would benefit birds.
- Bat boxes could be incorporated into the buildings' design.
- Provision of wildlife areas, buffer strips and corridors within the design, including features such as log piles and habitat houses for hedgehogs / bees / invertebrates.

- Planting beds using species of benefit to wildlife, such as nectar-rich plants (not double-flowered varieties).
- Use of native tree and shrub species in the planting scheme. This can include creating new native hedgerows.
- Native bulb planting using woodland species around planted trees and shrubs.
- Make a hole / gap measuring approximately 25cm in any fences to allow hedgehogs to commute and forage through the gardens and the new development.

6 SUMMARY

A Preliminary Ecological Appraisal and Hedge Survey were undertaken in relation to a proposed residential development on land at Arlecdon, Cumbria.

The damp semi-improved grassland and ruderal/scrub vegetation is of limited conservation interest in terms of the vegetation, with no impacts expected from their removal and no mitigation required.

The marshy grassland and species-rich neutral grassland are S41 Priority Habitats and would be of some conservation interest. However, the areas of these habitats are small and the overall impact is low. There is an opportunity to create a species-rich meadow area to offset the loss of these habitats.

Hedge H1 is considered to be of moderate conservation value. The removal of sections of Hedge H1 is considered to be of low to moderate impact. Mitigation measures will adequately reduce the impact. Recommendations on hedge protection have been provided.

There are habitats on site with some suitability for use by local populations of bats, birds and other species. Recommendations on timing, methods, good practice / harm avoidance and habitat enhancement have been provided in this report.

All European protected species and species of conservation concern should be considered at all times during construction, and if individual animals are suspected or appear within the construction phase, works must stop and further guidance to protect from harm and disturbance should be sought by contacting an approved ecologist.

There is an opportunity to increase the biodiversity of the site. The proposed landscape plan to accompany a planning application should be produced in accordance with the National Planning Policy Framework (NPPF) in order to 'minimise impacts on biodiversity and provide net gains in biodiversity where possible...' and the local planning authority should take into account the policies contained in the Framework when making any decision. The proposed landscape features need to be created in a way that they are suitable for and will be used by wildlife. The proposed landscape plan should also use UK native species from reputable sources, ideally of local Cumbrian provenance.

This report must be made available to all contractors.

7 REFERENCES/BIBLIOGRAPHY

CIEEM (2017). Guidelines on Ecological Report Writing 2nd edition. Chartered Institute of Ecology and Environmental Management, Winchester.

Collins, J. (2016). Bat Surveys for Professional Ecologists: Good Practice Guidelines 3rd Edition, Bat Conservation Trust.

DEFRA (2002). The Hedgerow Regulations 1997. A Guide to the Law and Good Practice.

DEFRA (2011). Biodiversity 2020: A strategy for England's wildlife and ecosystem services.

Government Circular (2005). Biodiversity and Geological Conservation – Statutory Obligations and their Impact within the Planning System.

Historical Mapping (2017). OS County Series: Cumberland 1863 1:2,500. Ordnance Survey and Landmark Information Group. Old-Maps.co.uk.

HMSO (1981). Wildlife and Countryside Act 1981, Schedule One.

HMSO (1997). The Hedgerow Regulations 1997. Statutory Instrument 1997 No.1160.

HMSO (1992). Protection of Badgers Act 1992.

HMSO (2000). Countryside and Rights of Way Act 2000.

HMSO (2006). Natural Environment and Rural Communities (NERC) Act 2006.

HMSO (2017). The Conservation (Natural Habitats, &c.) Regulations 2017. Statutory Instrument 2017 No. 1012.

Hundt, L. (2016). Bat Surveys: Good Practice Guidelines 3rd Edition, Bat Conservation Trust.

JNCC (1994). Biodiversity: The UK Action Plan.

JNCC (2003). Handbook for Phase 1 habitat survey: a technique for environmental audit (revised reprint). JNCC: Peterborough.

JNCC (2012). UK Post-2010 Biodiversity Framework.

MAGIC (2017) Ordnance Survey 100022861. Natural England.

National Planning Policy Framework (2012). Conserving and Enhancing the Natural Environment.

Natural England (2011). 'Badgers and Development' (IN75).

Stace, C. (2010). New Flora of the British Isles (3rd Edition). CUP, Cambridge.

Whitehurst, J (2001). Great Crested Newt Mitigation Guidelines. English Nature, Peterborough.

8 APPENDIX ONE: Photos



Photo 1. Hedge H1.



Photo 2. Field from north-west corner.



Photo 3. Scrub and ruderal vegetation in eastern corner (with beech hedge in background).



Photo 4. Ruderal and scrub vegetation (with young Sycamore regrowth and Leylandii hedge in background) in southern corner.



Photo 5. Extensive feeding signs of bank/field vole, prey food for barn owl.



Photo 6. Stand of Montbretia

9 APPENDIX TWO: Legislation and Species Status

Species	Latin Name	EC Habitats Directive	Wildlife and Countryside Act	Protection of Badgers Act	Section 41, NERC Act	Cumbria BAP
Bat species (All species)		Annex IV (some Annex II)	Schedule 5		X	X
Bullhead	<i>Cottus gobio</i>	Annex II				
Dormouse	<i>Muscardinus avellanarius</i>	Annex IV	Schedule 5 and 6		X	X
Great crested newt	<i>Triturus cristatus</i>	Annex II and IV	Schedule 5		X	X
Lamprey species	<i>Lampetra/Petromyzon</i>	Annex II			X	X
Natterjack toad	<i>Epidalea calamita</i>	Annex IV	Schedule 5		X	X
Otter	<i>Lutra lutra</i>	Annex II and IV	Schedule 5 and 6		X	X
Reptile species		(some Annex IV)	Schedule 5		X	X
Salmon	<i>Salmo salar</i>	Annex II			X	X
White-clawed crayfish	<i>Austropotamobius pallipes</i>	Annex II	Schedule 5		X	X
Barn owl	<i>Tyto alba</i>		Schedule 1			X
Pine marten	<i>Martes martes</i>		Schedule 5 and 6		X	
Polecat	<i>Mustela putorius</i>		Schedule 6		X	
Red squirrel	<i>Sciurus vulgaris</i>		Schedule 5 and 6		X	X
Water vole	<i>Arvicola amphibious</i>		Schedule 5		X	X
Badger	<i>Meles meles</i>			X		
Brown hare	<i>Lepus europaeus</i>				X	X
Common toad	<i>Bufo bufo</i>				X	X
Hedgehog	<i>Erinaceus europaeus</i>				X	X

10 APPENDIX THREE: Phase 1 Habitat Map

