Scottish Power Energy Networks

Kennoxhead to Dalquhandy OHL

Preliminary Ecological Appraisal

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EXPERTS IN ECOLOGY

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EXECUTIVE SUMMARY

1. This report presents the results of a preliminary ecological appraisal undertaken along the route of a proposed 132kV overhead line grid connection between Kennoxhead wind farm and Coalburn substation in South Lanarkshire, over a distance of *c.*14 km.
2. There are several designated sites close to the site, including Coalburn Moss special area of conservation (SAC) and site of special scientific interest (SSSI) and Muirkirk Uplands/Muirkirk and North Lowther Uplands SSSI and special protection area (SPA). A habitat regulations assessment (HRA) will be required in relation to these internationally designated sites.
3. The dry heaths and bog habitats on the site correlate with Annex 1 habitat types. The condition of these habitats varies as there has been a degree of modification throughout the site and therefore not all instances of community types will constitute an Annex 1 habitat. Detailed national vegetation classification and groundwater dependent terrestrial ecosystem assessments have also been undertaken and will be reported separately.
4. There are no plant species from the habitats recorded on site that are critically endangered, endangered or vulnerable on the IUCN Red list. Japanese Knotweed and Japanese Rose were found along the route. A method statement will be required for any works within 7 m of these plants.
5. The route provides suitable habitat for a range of protected species. Further surveys to determine the value of the site, the extent of potential constraints, and to inform site designs, are recommended as follows:
    - badger walkover survey;
    - ground level tree assessment and preliminary roost assessment of structures for bat roost potential;
    - pine marten survey;
    - red squirrel survey;
    - otter survey; and
    - water vole survey.
6. The route also provides suitable habitat for common species of reptiles as well as common toad, as such a method statement for these species should be produced before works start.
7. Ecological surveys of any new access tracks, works compounds and laydown areas should be undertaken when their location is known and prior to any construction works in these areas.

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1.0 INTRODUCTION

1.1 Purpose of this report

1.1.1 This report presents the results of a preliminary ecological appraisal (PEA) carried out in July and August 2020 along the route of a proposed 132kV overhead line grid connection between Kennoxhead wind farm (Grid ref: 277165E 624386N) and Coalburn substation (Grid ref: 282510E 637337N). in South Lanarkshire. The overhead line will be *c.*14 km in length and constructed using wooden poles with lines *c.*13 m in high.

1.1.2 This report identifies the habitats and species present (or likely to be present) along the route and advises where further ecological surveys are required to determine the impacts of any development.

1.1.3 The survey area (termed 'the site' throughout this report) includes all areas within a 250m buffer of the route alignment for the botanical element and 50 m for the protected species element (Figure 1). Access tracks and laydown areas have not been determined at this stage and therefore have not been surveyed.

1.2 Landscape context

1.2.1 The route passes through varied habitats including two disused quarries, peat bog, grazed fields and plantation woodland. It also crosses the Douglas Water. There are numerous small waterbodies and burns in the vicinity of the route. Part of the Muirkirk Uplands/Muirkirk and North Lowther Uplands site of special scientific interest (SSSI)/special protection area (SPA) lies immediately to the south west of the route, and Coalburn Moss special area of conservation (SAC)/ SSSI lies immediately to the south of the planned substation.

2.0 METHODS

2.1 General

2.1.1 The survey was undertaken in line with guidance from the Chartered Institute of Ecology and Environmental Management (CIEEM, 2017), and it therefore includes:

- a desk study (information gathered from national websites; local record centres, councils, local wildlife groups, published material, previous reports etc.) here called a background data search (BDS).
- a field survey that includes an assessment of the possible presence of protected or priority species and the likely importance of habitat features, and notes and mapping of any incidental sightings of non-native invasive plant species and protected or priority mammal species.

2.1.2 The appraisal has allowed an evaluation of the ecological importance of the site, or - where insufficient to do so - indicates what further surveys are needed.

2.1.3 The survey was carried out in July and August 2020 by experienced botanist Irene Tierney of IMTeco Ltd, on behalf of RSK Biocensus, with protected species elements surveyed by RSK Biocensus consultant ecologist Julia Richards. Both ecologists are very experienced in these types of surveys.

2.2 Background data search

2.2.1 A search was made in January 2019 (when the ecological work was first commissioned) for reference materials relating to the ecology of the site, and a list of sources is given in Table 1.

Table 1: Data Sources

Information Obtained	Available From
Protected and Noteworthy species-records	Glasgow Museums Biological Records Centre
Designated site locations and citations	Scottish Natural Heritage website
Designated site locations and citations	Glasgow Museums Biological Records Centre
Ancient Woodland Inventory	Forestry Commission Website
Designations and legal protection of noteworthy species	Joint Nature Conservation Committee (JNCC) website
Details of species and habitats listed on the West Lothian LBAP	Local BAP website https://www.southlanarkshire.gov.uk/downloads/file/1191/biodiversity_strategy_2018_-_2022

2.2.2 A search was made for information on statutory designated sites (often internationally and nationally important sites for ecology) within 2 km of the site boundary and non-statutory designated sites (often important in a local context) within 1 km. A search was also made for records of noteworthy species within 2 km of the site boundary. Species included in the search parameters were:

- European protected species (listed on Schedule 2 and 4 of the Conservation (Natural Habitats, & c.) Regulations 2017 (as amended);
- nationally protected species under Schedules 1, 5 and 8 of The Wildlife & Countryside Act 1981 as amended by The Wildlife and Natural Environment (Scotland) Act 2011 and The Protection of Badgers Act 1992;
- species listed as critically endangered, endangered or vulnerable on the IUCN Red List;
- all species listed on the RSPB Birds of Conservation Concern 4 as red or amber;
- Nationally rare or nationally scarce species;
- Notable invertebrates; and
- species that have action plans under the Scottish Biodiversity List (SBL) or are priority species under the local biodiversity action plan.

2.2.3 In addition to a background data search as detailed above, RSK Biocensus undertook a desk-based data review which involved reviewing data from the following existing projects: Dalquhandy to Coalburn OHL project (2017), Kennoxhead Wind Farm (2012), Douglas West Wind Farm (2015), Poniel Wind Farm (2012) and Glentaggart Wind Farm (2010).

2.3 Phase 1 Habitat Survey

2.3.1 A Phase 1 habitat survey (JNCC, 2010) as extended for use in Environmental Impact Assessments (Chartered Institute of Ecology and Environmental Management 2017) was undertaken. This involved the following elements.

- Habitat mapping using a set of standard colour codes to indicate habitat types on a phase 1 habitat map.
- Description of features of possible ecological or nature conservation interest in notes relating to numbered locations on the phase 1 habitat map, called 'target notes'.

2.3.2 Plant nomenclature in this report follows Stace (2019) for native and naturalised species of vascular plant and mosses and liverworts follow Hill et al. (2008). Introduced species and garden varieties were identified using the relevant texts. Common names are provided first with the scientific name following in brackets in the first instance of each name.

Non-native Invasive Species (INNS)

2.3.3 Phase 1 habitat survey does not involve exhaustive surveying for any individual plant species, but if invasive plant species listed under Schedule 9 (Part II) of the Wildlife and Countryside Act 1981 (as amended), e.g. Giant Hogweed (*Heracleum mantegazzianum*),

Himalayan Balsam (*Impatiens glandulifera*) or Japanese Knotweed (*Reynoutria japonica*) were seen during the normal course of the survey then they were noted.

2.4 Habitat assessment for protected animals

2.4.1 The site was assessed for its suitability for the protected animals that are likely to occur in the area. Obvious signs and incidental sightings of protected species were noted where present, although this type of survey cannot usually confirm whether species are actually present or absent.

2.4.2 Taking into account the habitats present at the site and in the vicinity, as indicated by the BDS, assessment was carried out for the species or groups listed below.

Reptiles

2.4.3 The site was assessed for its potential to support common reptile species, with particular attention paid to features providing suitable basking areas (e.g. south-facing slopes), potential hibernation or egg-laying habitat (e.g. piles of rubble, banks and compost heaps) and opportunities for hunting (e.g. rough grassland and scrub). The site was assessed for its suitability for adder (*Vipera berus*), common lizard (*Zootoca vivipera*), and slow-worm (*Anguis fragilis*); specific habitat requirements differ between species.

Birds

2.4.4 Birds are discussed in separate detailed ornithological reports and are not discussed further here.

Bats

2.4.5 The potential for roosting, foraging and commuting bats along the route was assessed however, detailed surveys were not undertaken as part of the PEA.

Water Voles

2.4.6 An initial assessment was carried out to identify water bodies which might be used by water voles (*Arvicola amphibius*). Signs of the presence of water voles include droppings, tracks, burrows and food piles.

Otters

2.4.7 An initial assessment was carried out to identify water bodies which might be used by otters (*Lutra lutra*). Signs of otters include spraint (droppings), footprints, slides, paths, feeding evidence, holts (underground resting places) or couches (temporary resting places).

Badgers

2.4.8 An initial assessment was carried out to identify areas that might be used by badgers (*Meles meles*) for commuting, foraging and sett-building.

Red Squirrel

2.4.9 An initial assessment of the habitat along the route to support red squirrel (*Sciurus vulgaris*) was undertaken as part of the walkover.

Pine Marten

2.4.10 An initial assessment of the habitat along the route to support pine marten (*Martes martes*) was undertaken as part of the walkover.

Other species of principal importance

2.4.11 Consideration was also given to the site's potential for other noteworthy species such as those listed on the Scottish Biodiversity List (SBL) that are likely to be present in the area e.g. European hedgehog (*Erinaceus europaeus*) and brown hare (*Lepus europaeus*).

2.4.12 The suitability of habitats along the route for invertebrates was also considered.

2.5 Constraints and limitations

2.5.1 Some areas of the route were very wet making it difficult to survey and record all plant species present.

2.5.2 At the time of the survey, an area of land west of Coalburn had recently been burned and as a result it was not possible to identify the plant species present.

2.5.3 The preliminary view as to whether protected species might occur on the site is based on the suitability of habitat, the known distribution of relevant species in the local area (from on-line sources and desk study), and any signs of the relevant species. It does not constitute a full and definitive survey of any protected species group. Only the 250 m buffer from the route was surveyed for botanical elements and 50 m for protected species, no new access tracks or construction laydown areas were surveyed as these had not yet been determined at the time of survey.

3.0 RESULTS

3.1 Background data search

Biodiversity Action Plans

3.1.1 Habitats on the site qualify as the priority habitat types under the Scottish Biodiversity List are;

- ponds;
- rivers;
- blanket bog;
- upland flushes, fens and swamps;
- upland heathland;
- upland birchwoods; and
- wet woodland

3.1.2 The South Lanarkshire Biodiversity Strategy (2018 – 2022) does not contain habitat action plans (HAP) and species action plans (SAP), but instead focuses on six ecosystems which are of greatest importance within South Lanarkshire. The local ecosystems that are relevant to the proposed development are;

- freshwater;
- lowland and farmland;
- peatland;
- upland;
- urban; and
- woodland

Designated Sites

Statutory Sites

3.1.3 There are 14 statutory designated sites within 2 km of the site boundary, comprising one special protection area (SPA), two special areas of conservation (SAC), nine sites of special scientific interest (SSSI), two important bird areas (IBA). These sites are listed in *Table 2* in order of proximity to the site; short descriptions are given for the sites.

Table 2: Statutory Designated Sites

Site Name	Designation	Approximate Distance (m)
Muirkirk and North Lowther Uplands	**SPA**	**0**
The Muirkirk and North Lowther Uplands SPA comprises three adjacent upland areas, together with Airds Moss, a low-lying blanket bog. The predominant habitats include semi-natural areas of blanket bog, acid grassland and heath. The boundaries of the SPA are coincident with those of North Lowther Uplands SSSI, Blood Moss and Slot Burn SSSI, Garpel Water SSSI, Ree Burn and Glenbuck Loch SSSI and coincident with those of Muirkirk Uplands SSSI, except for the		

Site Name	Designation	Approximate Distance (m)
exclusion of the Upper Heilar and Tarmac forestry plantations on Airds Moss and the exclusion of Blood Moss, south of Dalblair. This SPA qualifies by regularly supporting populations of golden plover (*Pluvialis apricaria*), hen harrier (*Circus cyaneus*), merlin (*Falco columbarius*), peregrine (*Falco peregrinus*) and short-eared owl (*Asio* flammeus)		
Coalburn Moss	**SAC**	**0**
The Coalburn Moss SAC was designated for having the following qualifying interests: • Active raised bogs • Degraded raised bogs still capable of natural regeneration		
Coalburn Moss	**SSSI**	**0**
The Coalburn Moss SSSI is one of the best examples of lowland raised bog in the United Kingdom for its actively-growing Sphagnum-rich vegetation. The raised bog habitat is extensive and subtle variations in nutrient conditions within the bog affects the distribution of the individual species and gives rise to the distinctive undulating, and often colourful, surface pattern characteristic of raised bogs. These patterns consist of well-defined hollows, dominated by *Eriophorum angustifolium* (Common Cottongrass) and *Sphagnum cuspidatum* (Feathery Bogmoss), within a mosaic of ridges and hummocks of Sphagnum mosses. High ridges are characterised by the bog mosses *Sphagnum capillifolium* (Red Bogmoss), *Sphagnum magellanicum* (Megallanic Bogmoss) and *Sphagnum papillosum* (Papillose Bogmoss) together with Hare's-tail Cottongrass, Round-leaved Sundew, Cranberry and *Cladonia portentosa* (Reindeer Lichen). Lower ridges are characterised by *Sphagnum papillosum* (Papillose Bogmoss) and *Sphagnum tenellum* (Soft Bogmoss) indicating a surface recovering from past burning and drainage. Around the margins of the raised bog is a secondary lagg or modified vegetation dominated by *Juncus effusus* (Soft Rush) and *Deschampsia cespitosa* (Tufted Hair-grass) with *Betula pendula* (Silver Birch) woodland in places. There are also areas of wet and dry grassland within the boundary. The grassland that lies over peat is considered to be part of the same hydrological unit as the active raised bog and is important in maintaining the hydrological condition of the site as a whole.		
North Lowther Hills	**IBA**	**0**
The North Lowther Hills IBA is an upland block to the east of Airds Moss, comprising moorland and areas of active blanket bog. The IBA supports a range of breeding upland species.		
North Lowther Uplands	**SSSI**	**0**
The North Lowther Uplands SSSI contains the Bail Hill Geological Conservation Review (GCR) site which displays a section through the "throat" of a volcano. This was active 480 million years ago at a time when the Southern Uplands were being laid down as sediments on the floor of an ancient ocean, the Iapetus Ocean. The area around Bught Craig shows a wide variety of rock types erupted by the volcano and a number of different rock types that collapsed into the volcano before it became extinct. The SSSI supports a range of upland habitats and associated species showing good examples of the characteristic plant communities of the Southern Uplands. The dominant habitats include blanket bog, wet and dry heaths and acid grassland. On flatter areas the vegetation largely comprises a range of blanket bog and wet heath communities. The North Lowther Uplands SSSI also has a mosaic of upland grassland habitats. The range of habitats, many of them heather dominated, provide a mosaic of breeding and foraging habitats for the diverse upland bird community which is of national importance. Amongst the species present are curlew (*Numenius arquata*), dunlin (*Calidris alpina*), golden		

Site Name	Designation	Approximate Distance (m)
plover (*Pluvialis apricaria*), hen harrier (*Circus cyaneus*), merlin (*Falco columbarius*), peregrine (*Falco peregrinus*), raven (*Corvus corax*), red grouse (*Lagopus lagopus*), redshank (*Tringa totanus*), short-eared owl (*Asio* flammeus), snipe (*Gallinago gallinago*), teal (*Anas crecca*), wheatear (*Oenanthe oenanthe*) and whinchat (*Saxicola rubetra*). The breeding population of hen harriers is of both national and European importance.		
Miller's Wood	**SSSI**	**0**
The Miller's Wood SSSI is an excellent example of *Betula* sp. (Birch) woodland, a type which is rare in South Lanarkshire. The canopy is dominated by even-aged and dying birch, predominantly *Betula pubescens* (Downy Birch) with occasional *Betula pendula* (Silver Birch), with *Sorbus aucuparia* (Rowan) frequently occurring. The dominant tree in wetter areas is *Alnus glutinosa* (Alder) although *Salix* sp. (Willow) is also frequent in places. Near the southwest corner of the site there is a small area of woodland which contains *Corylus avellana* (Hazel) and *Prunus padus* (Bird Cherry).		
Shiel Burn	**SSSI**	**0**
The Shiel Burn SSSI comprises exposures along a 325 m stretch of stream that flows into the Monks Water. It lies within the Hagshaw Hills Silurian Inlier and exposes the lower Wenlock Fish Bed Formation of the Glenbuck Group. It yields the same fossil fauna as that known from the 'fish' beds of the Dippal Burn Formation (with which it is correlated) and the Slot Burn Formation in the Lesmahagow Inlier. It is the most prolific Hagshaw Hill site and it is important because rare and unusual vertebrates can still be found here. This assemblage is comparable to the faunal assemblage at Rudstangen, Ringerike (South Norway). These primitive jawless vertebrates are all rare and important because of the information they can supply about the early origins of vertebrates, the first developments of bony exoskeletons, and the lifestyles of the first primitive fish. The site is a nationally important palaeontological locality for vertebrate studies.		
Ree Burn and Glenbuck Loch	**SSSI**	**0**
The Ree Burn and Glenbuck Loch SSSI is of special palaeoenvironmental and palaeontological significance, demonstrating changes which occurred at the time of the closure of the Iapetus ocean. The site is one of the most geologically important Silurian inliers in the Midland Valley and shows the important transition from a fully marine environment to terrestrial conditions, which occurred here during the Silurian Period.		
Airds Moss and Muirkirk Uplands	**IBA**	**0**
The Airds Moss and Muirkirk Uplands IBA includes the largest remaining continuous block of unforested moorland in South West Scotland. The main habitats include heather and grass moorland and blanket bog.		
Kennox Water	**SSSI**	**0**
The Kennox Water SSSI comprises rock exposures along a 2 km stretch of Kennox Water and its associated riverbanks and cliffs. This locality shows a typical local Lower and Upper Carboniferous development (spanning approximately 359 to 299 million years ago), through the cyclic sequences of the Upper Limestone, Limestone Coal and Lower Limestone Groups. At the base, beds assigned to the Calciferous Sandstone Measures rest uncomfortably on strata of the Lower Old Red Sandstone. This is a key site for Dinantian (Lower Carboniferous) stratigraphic studies, showing a thick succession and a regionally significant unconformity.		
Muirkirk Uplands	**SSSI**	**0**

Site Name	Designation	Approximate Distance (m)
The Muirkirk Uplands SSSI includes two upland areas situated to the north and south of the town of Muirkirk and Airds Moss, a low-lying blanket bog. The protected natural features include localised exposures of fossiliferous rock, upland habitats and blanket bog, an associated assemblage of breeding birds, a breeding population of short-eared owl (*Asio* flammeus), plus breeding and non-breeding (wintering) populations of hen harrier (*Circus cyaneus*). There are extensive areas of intact wet heath and blanket bog typified by *Erica tetralix* (Cross-leaved Heath) and *Sphagnum* sp. (Bog Mosses). Where modification of blanket bog has taken place through drainage, grazing and burning the vegetation is dominated by *Eriophorum vaginatum* (Hare's-tail Cotton-grass). Fine examples of drier heathland vegetation are found on steeper, more well-drained ground. A mosaic of upland grassland habitats is also present. The blanket bog of Airds Moss displays features typical of this habitat but is unusual in that these have developed at a relatively low altitude. Fen and acid grassland habitats are found around the periphery of the moss. The mosaic of habitats within the Muirkirk Uplands supports a diverse upland breeding bird community which is of national importance. The upland moorland bird assemblage includes buzzard (*Buteo buteo*), curlew (*Numenius arquata*)**,** dunlin (*Calidris alpina*), golden plover (*Pluvialis apricaria*), hen harrier (*Circus cyaneus*), merlin (*Falco columbarius*), peregrine (*Falco peregrinus*), red grouse (*Lagopus lagopus*), redshank (*Tringa totanus*), ring ouzel (*Turdus torquatus*), short-eared owl (*Asio* flammeus), snipe (*Gallinago gallinago*), stonechat (*Saxicola rubicola*), teal (*Anas crecca*), wheatear (*Oenanthe oenanthe*) and whinchat (*Saxicola rubetra*). The site is of particular importance, both nationally and internationally, for breeding hen harrier and short-eared owl. Hen harriers also winter within the site in nationally important numbers.		
Red Moss	**SAC**	**580**
The Red Moss SAC was designated for having the following qualifying interests: • Active raised bogs		
Red Moss	**SSSI**	**580**
The Red Moss SSSI comprises three raised bogs with associated fen situated along the broad valley of the Black Burn and its tributaries. The raised bog is one of the best examples in Lanarkshire and is dominated by *Scirpus cespitosus* (Deergrass) and *Eriophorum vaginatum* (Hare's Tail Cottongrass). Sphagnum moss cover is generally extensive, especially on the northern raised bog. The Nationally Scarce *Sphagnum austinii* (Austin's Bogmoss) is found in locally frequent tall hummocks on the northern raised bog. A narrow band of lagg vegetation surrounds the raised bogs.		
Birkenhead Burn	**SSSI**	**1,035**
The Birkenhead Burn SSSI is one of a network of Silurian sites in the Midland Valley of Scotland that yields important vertebrate fossil-bearing rocks. Several fossil-bearing rock exposures, on the south side of the Birkenhead Burn, are of the Slot Burn Formation of the Waterhead Group. These rock exposures are probably of Wenlock age, which formed approximately 430 million years ago. The site is consequently of both national and international importance for its role in providing important information on the origin and evolution of vertebrates.		

Non-statutory Sites

3.1.4 There are no non-statutory designated sites within 2 km of the site boundary.

Other Notable Sites

3.1.5 There are 42 areas of ancient woodland within 2 km of the site boundary, with 26 of these falling within the site boundary itself.

Protected and Noteworthy Species

3.1.6 At least 73 noteworthy species are recorded from places within 2 km of the site boundary. Of these, 2 are amphibians, 45 are birds, 1 is a fish, 21 are invertebrates1 is a reptile and at least 3 are mammals (of these, at least 1 is a bat). Species that are protected by law under Schedules 2 and 4 of The Conservation (Natural Habitats, & c.) Regulations 1994 (as amended); Schedules 2, 5 and 8 of The Wildlife and Countryside Act 1981 as amended by The Wildlife and Natural Environment (Scotland) Act 2011 or The Protection of Badgers Act 1992 and have been recorded in the search area are listed in the table below (excluding species protected only against collection for sale); a full species list is given in Appendix A.

Table 3: Protected species records within 2 km of the site boundary

Latin Name	Common Name	Designation	Most Recent	No of Records	Within 100m	Within 1km	Within 2km
Birds						**P**	
Accipiter gentilis	Goshawk	WCA1	2018	2	☒	☒	☒
Alcedo atthis	Kingfisher	WCA1	2003	1	☒	☒	☒
Anser anser	Greylag goose	WCA1	2018	182	☒	☒	☒
Bucephala clangula	Goldeneye	WCA1	2018	9	☒	☒	☒
Charadrius dubius	Little ringed plover	WCA1	2018	9	☒	☒	☒
Circus aeruginosus	Marsh harrier	WCA1	2016	2	☒	☒	☒
Circus cyaneus	Hen harrier	WCA1	2015	2	☒	☒	☒
Cygnus cygnus	Whooper swan	WCA1	2018	52	☒	☒	☒
Falco columbarius	Merlin	WCA1	2003	3	☒	☒	☒
Fringilla montifringilla	Brambling	WCA1	2018	2	☒	☒	☒
Limosa limosa	Black-tailed godwit	WCA1	2018	62	☒	☒	☒
Loxia curvirostra	Common crossbill	WCA1	2018	57	☒	☒	☒
Pandion haliaetus	Osprey	WCA1	2004	2	☒	☒	☒
Porzana porzana	Spotted crake	WCA1	2014	1	☒	☒	☒
Tringa glareola	Wood sandpiper	WCA1	2015	2	☒	☒	☒
Tringa nebularia	Greenshank	WCA1	2016	5	☒	☒	☒

Latin Name	Common Name	Designation	Most Recent	No of Records	Within 100m	Within 1km	Within 2km
Tringa ochropus	Green sandpiper	WCA1	2018	20	☒	☒	☒
Turdus pilaris	Fieldfare	WCA1	2018	434	☒	☒	☒
Mammals							
Chiroptera	bats	HR-1994(Sch 2)	1997	51	☒	☒	☒
Sciurus vulgaris	Red squirrel	WCA5	2007	1			☒
Reptiles							
Zootoca vivipara	Common lizard	WCA5	2007	2	☒	☒	☒

Note - P relates to records with 4 figure or tetrad grid references that could potentially be anywhere within a 1 km or 2 km square.

3.1.7 In summary, the BDS returned records of the following protected species:

- Badger – 33 records from within 2 km of the study area, exact locations were not disclosed by the local records centre.
- Bats - 51 records, including from within 100 m of the study area, species not specified.
- Common lizard – two records from 2007 from within 100 m of the study area.
- Red squirrel – one record from 2007 from within 2 km of the study area.

3.1.8 In addition, records of several Scottish Biodiversity List species were returned including common toad (*Bufo bufo*) and 18 species of invertebrate. Records of common frog (*Rana temporaria*) were also returned.

Nearby developments review

3.1.9 A review of ecology reports compiled for nearby developments revealed that the following bat species have been found in the study area: brown long-eared bat (*Plecotus auritus*), common pipistrelle (*Pipistrellus pipistrellus*), Daubenton's bat (*Myotis daubentonii*), Leisler's bat (*Nyctalus leisleri*), Myotis species, Natterer's bat (*Myotis nattereri*), *Nyctalus* species and soprano pipistrelle (*Pipistrellus pygmaeus*).

3.1.10 Badger setts were found to be present around Coalburn, Muirburn and Glaikhead during surveys for the Daquhandy to Coalburn OHL in 2017. One of these setts is within or immediately adjacent to the preferred route.

3.1.11 Water vole evidence was recorded within the study area, including around Coalburn and opencast workings, in the southern section of the route. It is also expected that otter use water bodies in the area for foraging and commuting and evidence of otter near the opencast workings has previously been found, as well as near Johnshill in the northern section of the preferred route.

3.1.12 One common lizard was recorded within the study area during previous ecology surveys and it is expected that adder and slow worm are also present throughout the area.

3.1.13 Red squirrel was recorded in 2007 (as returned during the RSK background data search) but was not recorded during any of the surveys during the projects listed above.

3.1.14 No great crested newts (*Triturus cristatus*) have been recorded during presence/absence surveys (including eDNA surveys) previously undertaken in the area, as such, and as agreed with Nature Scot, this species is considered to be absent in the geographical location and is not discussed further in this report.

3.2 Phase 1 habitat survey

Overview

3.2.1 The site comprises the following habitat types; woodland & scrub, grassland & rush dominated vegetation, tall herb & fern, ephemeral, dry & wet heath, mire & flush, ponds, rivers, ditches & swamps, residential, hardstanding and substation associated structures. Field boundaries were typically formed by fences, dry stone walls and occasional hedgerows. A phase 1 habitat map is provided in *Figure 1* and the phase 1 habitat types within the site boundary are listed in *Table 4* with target notes (TNs) listed in *Appendix C*.

Table 4: Phase 1 habitat types within the site boundary

Phase 1 Habitat Code	Phase 1 Habitat Description
A1.1.1	Broadleaved woodland - semi-natural
A1.1.2	Broadleaved woodland - plantation
A1.2.2	Coniferous woodland - plantation
A1.3.1	Mixed woodland - semi-natural
A1.3.2	Mixed woodland - plantation
A2.1	Scrub - dense/continuous
A3.1	Broadleaved Parkland/scattered trees
A3.2	Coniferous Parkland/scattered trees
A3.3	Mixed Parkland/scattered trees
A4.2	Coniferous woodland - recently felled
B1.1	Acid grassland - unimproved
B1.2	Acid grassland - semi-improved
B2.1	Neutral grassland - unimproved
B2.2	Neutral grassland - semi-improved
B4	Improved grassland
B5	Marsh/marshy grassland
C1.1	Bracken - continuous
C3.1	Other tall herb and fern - ruderal

Phase 1 Habitat Code	Phase 1 Habitat Description
D1.1	Dry dwarf shrub heath - acid
D2	Wet dwarf shrub heath
D5	Dry heath/acid grassland
D6	Wet heath/acid grassland
E1.6.1	Blanket sphagnum bog
E1.6.2	Raised sphagnum bog
E1.7	Wet modified bog
E2.1	Flush and spring - acid/neutral flush
E4	Peat - bare
F1	Swamp
G1	Standing water
G2	Running water
I1.5	Cave
I2.2	Spoil
J1.2	Cultivated/disturbed land - amenity grassland
J1.3	Cultivated/disturbed land - ephemeral/short perennial
J2.6	Dry ditch
J2.7	Boundary removed (old stone dyke boundary)
J3.6	Buildings
J4	Bare ground

Habitat Descriptions

3.2.2 The following general habitat descriptions are grouped and presented in terms of the general habitat categories used for phase 1 habitat survey.

Woodland & Scrub

3.2.3 Woodland is defined as vegetation dominated by trees more than 5 m high when mature, forming a distinct and sometimes open canopy, where the cover of trees is over 30%. Scrub can be a seral community or climax vegetation dominated by locally native shrubs, usually less than 5 m tall, occasionally with a few scattered trees.

Broadleaved Semi-Natural Woodland

3.2.4 Broadleaved semi-natural woodland is classified as broadleaved stands which do not obviously originate from planting and have less than 10 % conifer in the canopy. Types of trees commonly found within the semi natural broadleaved woodland on site includes Alder (*Alnus glutinosa*), Ash (*Fraxinus excelsior*), Aspen (*Populus tremula*), Bay Willow (*Salix pentandra*), Beech (*Fagus sylvatica*), Downy Birch (*Betula pubescens*), Elder

(*Sambucus nigra*), Goat Willow (*Salix caprea*), Grey Willow (*Salix cinerea*), Hawthorn (*Crataegus monogyna*), Rowan (*Sorbus aucuparia*), Sessile Oak, (*Quercus petraea*), Silver Birch (*Betula pendula*), and Sycamore (*Acer psuedoplatanus*).

3.2.5 Broadleaved semi-natural woodland was found within the survey area at the following locations;

- Kennox to West Douglas section: at Carmacoup (TN1), Glespin village (TN2), along the western edge of Woodrow Wood (TN3), and the western edge of Long Plantation (TN4).
- West Douglas to Coalburn village section: continuing along the western edge of Long Plantation and at Coalburn village (TN5 & TN6).
- Coalburn village to Coalburn Substation section: small areas at Coalburn along the road edges (TN7) and at the mining spoil heap/tip where there is naturalised tree regeneration (TN8) and scrub.
- Broadleaved woodland is also found along the Coalburn Road (TN9) (Photo 1), and within farmland.

Photo 1 Broadleaved woodland located along the Coalburn Road.

Broadleaved Plantation Woodland

3.2.6 This category consists of planted woodland of any age which has 10 % or less conifer in the canopy. Types of trees commonly found within the broadleaved plantations site includes Bay Willow, Beech, Downy Birch, Elder, Goat Willow, Grey Willow, Hawthorn, Rowan and Sessile Oak.

3.2.7 Broadleaved plantation woodland was found within the survey area at the following locations;

- Kennox to West Douglas section: At Carmacoup (TN10), and along the western edge of Long Plantation (TN11).

- West Douglas to Coalburn village section: Small sections along the Long Plantation at West Douglas Continuing along the western edge of Long Plantation (TN12) and to the west of Coalburn village.
- Coalburn village to Coalburn Substation section: Pockets of this category are found near Coalburn village (TN13) (Photo 2) and areas within farmland south west of Coalburn Substation (TN14).

Photo 2: Young broadleaved plantation woodland located within the survey area.

Coniferous Plantation Woodland

3.2.8 This is coniferous planted woodland of any age which has 10% or less broadleaved in the canopy which is included in this category.

3.2.9 Coniferous plantation woodland is a common woodland type through much of the survey area and was found at Kennoxhead (TN15) and Carmacoup (TN16), including Woodrow Wood and Long Plantation through to woodland groups to the west of Coalburn village (TN17). Types of trees commonly found within the coniferous plantations site includes European Larch (*Larix decidua*), Sitka Spruce (*Picea sitchensis*) and Scots Pine (*Pinus sylvestris*).

3.2.10 These types of woodlands are of negligible botanical value due to over-shading and loss of the field flora.

3.2.11 A number of areas of the coniferous woodland have also been recently clear-felled (A4.2 Coniferous woodland - recently felled) (Photo 3) in the vicinity of Kennoxhead, to leave areas covered in stumps, brash, and little flora (TN18).

Photo 3: Felled coniferous woodland

Mixed Semi-Natural Woodland

3.2.12 Mixed semi-natural woodlands are woodlands which have between 10-90% of either broadleaved or coniferous species in the canopy.

3.2.13 There are a few woodlands of this type on site of varying sizes and many are also associated with long term regeneration of vegetation, mainly trees and scrub. They can be part of seral vegetation, with some being more established communities.

3.2.14 One of the largest areas can be found at the mining heap to the east of Coalburn Road (TN19). This area is densely populated with Birch, including Birch hybrids (Photo 4).

Photo 4: Mixed semi-natural woodlands associated with long term regeneration of vegetation - mainly trees and scrub at Coalburn spoil.

Mixed Woodland Plantation

3.2.15 Mixed woodland plantations are planted woodland of any age which has between 10-90% of either broadleaved or coniferous species in the canopy.

3.2.16 These can be found throughout the site in pockets, however there is a concentration of these west of Coalburn village (TN20) and along Coalburn Road (TN21 to TN24), among farmland (TN25 & TN26) and planted at the edges of Coalburn substation (TN27 & TN28) (Photo 5).

3.2.17 Types of trees commonly found within the mixed woodland plantations on site include Bay Willow, Beech, Downy Birch, Elder, Grey Willow, Goat Willow, Hawthorn, Rowan, Sessile Oak and Scots Pine.

Photo 5: Mixed woodland plantations at Coalburn substation.

Mixed Scattered Trees

3.2.18 Mixed scattered trees include the category where tree cover is less than 30%. Individual trees or lines of trees are also included in this category, as well as widely spaced trees within seral communities.

3.2.19 Scattered trees were found throughout the survey area in all sections, sometimes associated with roads and field boundaries. Many are part of seral vegetation among reclaimed mining areas (examples at TN29, TN30 & TN31) and at the edges of established plantations (examples at locations from TN32 to TN33).

3.2.20 Birch and Willow are common throughout especially in wetter habitats. Regeneration of Sitka Spruce is also common where previous plantations are located.

Scrub

3.2.21 This habitat type includes dense and scattered stands of native shrubs less than 5 m in height.

3.2.22 Frequently recorded species included Bramble (*Rubus fruticosus*), Broom (*Cytisus scoparius*), Gorse (*Ulex europaeus*) and species of Willow (*Salix sp*).

3.2.23 The scrub habitat comprised of small isolated patches and linear strips along watercourses (example location at TN34) and woodland (TN35), and as seral community of Willow species (TN36 & TN37). Some minor patches of this community were too small to map.

Grassland and Marsh

3.2.24 Grasslands are common on site and are located from Kennoxhead up to Coalburn substation.

3.2.25 This wide-ranging category includes herbaceous vegetation dominated by grasses and also include wetter communities dominated by Rush (*Juncus* sp) or Sedge (*Carex* sp) species.

3.2.26 Much of the grassland habitats on site have undergone agricultural improvement to varying degrees and include large areas of hillside drainage, grazing, specific agricultural seed mix usage and use of fertilizer.

Unimproved & semi-improved acid grasslands

3.2.27 The unimproved & semi-improved acid grasslands (Photo 6) are found throughout the site, located from Kennox through to farmland near Johnshill.

3.2.28 The majority is classed as semi-unimproved grassland with occasional stands of more unimproved acid grassland. This is mainly due to drainage and grazing effects.

3.2.29 The majority of the acid grassland within the site has notable graminoids forming swards, such as Common Bent (*Agrostis capillaris*), Heath Rush (*Juncus squarrosus*), Matgrass (*Nardus stricta*), Sheep's-fescue (*Festuca ovina*), Sweet Vernal-grass (*Anthoxanthum odoratum*) and Wavy-hair Grass (*Deschampsia flexuosa*).

3.2.30 Throughout these swards there is overlap and transition amongst the typical species and there is a common range of associates throughout, including typical species such as Heath Bedstraw (*Galium saxatile*) and Tormentil (*Potentilla erecta*).

Photo 6: Semi improved acid grassland

Marshy grasslands

3.2.31 Marsh/marshy grassland is common within the site and is predominately made up of Sharp-flowered Rush (*Juncus acutiflorus*) and Soft Rush (*Juncus effusus*) rush-pasture (Photo 7), together with much smaller areas of Sweet Vernal-grass vegetation.

3.2.32 These communities also form mosaics and transitional areas with several other grassland and flush communities. Soft Rush tends to be the dominant species in open grassland fields that have been improved for grazing with poor drainage (TN38) and along drainage lines on hillsides (TN39). Soft Rush and Sharp-flowered Rush are also associated with species-poor assemblages of typically common herbs and grasses.

3.2.33 This type of marshy grassland can also be located at the base of shallow gradients or hillsides where multiple drainage channels collect forming larger expanses. This habitat is associated with watercourses and their floodplains. At Douglas West (NS81855 31354 & NS81872 31511) there are converging small watercourses, where marshy grassland is abundant due to seepage and within depressions (Photo 8).

3.2.34 A large area of marshy grassland is located within a field at the new Douglas West wind farm extension (NS 82923 32586) (*Photo 9*). This habitat is dominated by Sharp-flowered Rush, occasional Soft Rush, with pockets of Bogmoss (*Sphagnum* spp). and Haircap Moss (*Polytrichum* spp.) Visible pooling of water is evident in some sections. Patches of seral Willow (*Salix* spp.) is also within this habitat.

Photo 7: A sloped field with marshy grassland and occasional Willow species (at NS 80505 35504).

Photo 8: Abundant marshy grassland along small watercourses due to seepage and within depressions. This example of this habitat is at Douglas West (NS81855 31354 & NS81872 31511).

Photo 9: Large area of marshy grassland located within a field at the new Douglas West wind farm extension (NS 82923 32586). Dominated by Sharp-flowered Rush, occasional Soft Rush, with pockets of *Sphagnum* spp. and *Polytrichum* spp.

Neutral grasslands

3.2.35 Neutral grasslands tend to be more managed than the acid and calcareous grasslands. These are located throughout the site and with association to, or adjacent to farmland.

3.2.36 Much of the neutral grassland is damp forming mesotrophic grasslands with overlapping swards of Rush (Juncus spp.), Tufted-hair Grass (*Deschampsia cespitosa*) and Yorkshire-fog (*Holcus lanatus*).

3.2.37 Some pockets of neutral grassland were more diverse than others, with associates such as Bird's-foot Trefoil (*Lotus corniculatus*), Crested Dog's-tail (*Cynosurus cristatus*),

Common Knapweed (*Centaurea nigra*), False Oat-grass (*Arrhenatherum elatius*) and Smooth Meadow Grass (*Poa pratensis*).

3.2.38 Included within the more improved neutral grasslands were Crested Dog's-tail, Creeping Soft-grass (*Holcus mollis*), Common Bent, Perennial Rye-grass (*Lolium perenne*), Smooth Meadow Grass and Yorkshire-fog.

3.2.39 Herbaceous species included Broad-leaved Dock (*Rumex obtusifolius*), Bush Vetch (*Vicia sepium*), Common Knapweed, Common Sorrel (*Rumex acetosa*), Daisy (*Bellis perennis*), Greater Plantain (*Plantago major*), Meadow Buttercup (*Ranunculus acris*), Mouse-ear Chickweed (*Cerastium fontanum*), Red Clover (*Trifolium pratense*) and White Clover (*Trifolium repens*).

Improved grassland

3.2.40 This is a common habitat found in sections of the survey area and is largely characterised by pasture fields grazed by cattle and sheep.

3.2.41 Swards mostly comprised a limited range of species typical of heavily grazed pastures such as Crested Dog's-tail, Perennial Rye-grass and Yorkshire-fog with commonly occurring herbaceous species including Broad-leaved Dock, Daisy, Greater Plantain, Meadow Buttercup and White Clover, Swards of Timothy grass (*Phleum pratense*) were located at Kennoxhead (Photo 10).

3.2.42 Some improved fields are damp with poor drainage and these have an abundance of Soft Rush associated with this category.

Photo 10: Improved grassland of Timothy grass (*Phleum pratense*) at Kennoxhead

Other tall herb and fern

Continuous Bracken

3.2.43 Areas dominated by Bracken (*Pteridium aquilinum*) in continuous stands are located on drier slopes of semi improved grassland (Photo 11).

3.2.44 This habitat type was mainly found in the central locations of the survey area (TN40), north of the A70 up to Douglas West, with occasional small patches being present elsewhere.

3.2.45 This is of low conservation value and is regarded as invasive under certain circumstances.

Photo 11: Areas dominated by Bracken (*Pteridium aquilinum*) in continuous stands usually located on drier slopes.

Tall Ruderal

3.2.46 Large swathes of ruderal habitats were present within the reclaimed mining areas at Kennoxhead and at Coalburn. It consists of dense thickets of Colt's-foot (*Tussilago farfara*) (TN41), including typical species recorded within this habitat type, such as, Broad-leaved Dock, Creeping Thistle (*Cirsium arvense*), Common Nettle (*Urtica dioica*) and Rosebay Willowherb (*Chamerion angustifolium).*

3.2.47 Colt's-foot thrives on gravelly soil, especially within gravel pits or disturbed ground such as ex-mining areas. The Colt's-foot appears to be an early coloniser on the disturbed ground of the formerly open cast mining areas (Photo 12).

3.2.48 This is a weedy low conservation habitat.

Photo 12: Dense thickets of Colt's-foot (*Tussilago farfara*)

Heathland

Dry Heath

3.2.49 The dry heath on site is a characteristic sub-shrub on acid or impoverished soils at low to moderate altitudes. In this instance the dry heaths are located on base-poor soil and are moderately free draining.

3.2.50 There are some dry heath habitats on site which are also associated with pre-mining areas where the Heather (*Calluna vulgaris*) was typically abundant and has colonised previously exposed soil and clumps of peat-based soils.

3.2.51 Locations of dry heath can be found at previously mined areas (TN42, TN43, TN44), with some having been burnt (TN45), and at Coalburn spoil heap (TN46) (Photo 13).

3.2.52 Some dry heath also forms a mosaic with grassland, co-dominating with tufts of Wavy-hair Grass and including Heath Bedstraw and Tormentil.

Photo 13: Dry heath can be found at previously mined areas, such as at the Coalburn spoil.

Wet Heath

3.2.53 The wet heath and its mosaic with grassland on site included Bell Heather (*Erica cinerea*), Cross-leaved Heather (*Erica tetralix*), Heather and Purple Moor-grass (*Molinea caerulea*) with Bogmoss (*Sphagnum* spp.) species.

3.2.54 This habitat was associated with re-claimed mining areas (TN47 to TN51).

Mire, bog and flush habitats

Mire & Bog

3.2.55 The areas of bog habitat on site include sections of blanket bog, raised bog, modified bog and small patches of burnt bog. There are also small areas of bare peat.

3.2.56 Wet modified bog tends to include Cross-leaved Heather and Purple Moor-grass and is extensive in some sections of the site associations such as Bilberry (*Vaccinium myrtillus*), Bog Asphodel (*Narthecium ossifragum*), Common Cottongrass (*Eriophorum angustifolium*), Heath Bedstraw, Hare's-tail Cottongrass (*Eriophorum vaginatum*), Tormentil and Wavy-hair Grass .

3.2.57 Bogmoss (*Sphagnum* spp.) species include Blunt-leaved Bog-moss (*Sphagnum palustre)*, Lustrous Bog-moss (*S.subnitens),* Compact Bog-moss *(S.compactum),* Flat-topped Bog-moss *(S.fallax)* and Soft Bog-moss (*S.tenellum)*.

3.2.58 Many of the open areas containing wet modified bog have been subject to field drainage, varying levels of grazing by livestock and burning.

3.2.59 Sections of good condition raised bog are adjacent to Coalburn Moss SSSI (TN52 & TN53) and north of Shoulderigg Road (TN54). However, there is also extensive modification in some sections (TN55), which has had an impact on these habitats and a large area has previously been burnt (TN56) (Photo 14) and Purple Moor-grass has become dominant.

3.2.60 Other sections of modified bog consisting of Heather and hummocks of *Polytrichum* spp. and *Sphagnum* spp. carpets (Photo 15 & Photo 16) which then grades to a more grass like habitat to the north of this section (TN57). A large area of modified blanket bog (TN58) with swathes of Common Cottongrass (Photo 17).

3.2.61 In the area of Kennoxhead there are sections of blanket bog (TN59) where there has been no previous mining or ground disturbance, but modified bog also encroaches into previously open cast mined areas. This is where there are patches of exposed peat (TN60) and unevenly restored bog vegetation (TN61) (Photo 18). There is some tree regeneration on these modified bog habitats mainly of Sitka Spruce (TN62 & TN63).

Photo 14: Previously burnt bog habitat, with Purple Moor-grass becoming dominant

Photo 15: An area of modified bog consisting of Heather and hummocks of *Polytrichum* spp. (NS 80764 34254)

Photo 16: Wet modified bog with *Sphagnum* spp. carpets (NS 80762 34297)

Photo 17: Large sections of wet modified bog (TN58)

Photo 18: Patches of exposed peat & uneven restoration

Flush Habitats

3.2.62 Acid flushes are not common on site and tend to be associated with more acid soils (TN64 to TN66). These habitats tend to be flushes, soakaways and runnels consisting of Common Haircap Moss (*Polytrichum commune*), Sharp-flowered Rush Soft Rush and Bogmoss species including *Sphagnum fallax* and *Sphagnum palustre*.

3.2.63 Some flush habitats also occur in mosaics with dominant *Juncus* spp. communities along watercourses and ditches and are associated with some of the marshy grassland areas. These areas were too small to map.

Swamp, Marginal and Inundation

3.2.64 Swamp habitat was located on site and was restricted to small stands and marginal vegetation of ponds.

3.2.65 In the survey area at Kennoxhead there are four settling ponds with swamp and marginal vegetation mainly in three of the ponds (TN67 to TN69).

3.2.66 Many of the other ponds of varying sizes at Kennoxhead had marginal vegetation (too small to map) and consisted of Bottle Sedge (*Carex rostrata*), Bulrush (*Typha latifolia*), Soft Rush, Sharp-flowered Rush , Reed Canary-grass (*Phalaris arundinacea*) and Water Horsetail (*Equisetum fluviatile*).

3.2.67 The large pond at Douglas West had marginal vegetation (TN70) with dominant Bottle Sedge.

3.2.68 A stand of Bulrush and Common Valerian (*Valeriana officinalis*) was located along the Alder burn (TN71) (Photo 19).

3.2.69 Swamp habitat was also located at the old mining area south of Coalburn (TN72) (Photo 20) and along one of the ditches (TN73) in that section, where water flow was slow or blocked (Photo 21).

3.2.70 Marginal vegetation was found at the three settling ponds at Coalburn, with the first pond having more vegetation (TN74). A larger swathe of Rush (*Juncus* spp.) swamp and Sedge (*Carex* spp) was located within a bunded area north of Shoulderigg Road (TN75) (Photo 22), and east of the large spoil heap, north of Coalburn village (TN76).

3.2.71 There was a wide area of swamp with Rush (*Juncus* spp.) vegetation and Bottle Sedge at the pond located north of the spoil heap (TN77). This was a very wet area making it difficult to survey all plants in the pond vicinity (Photo 23).

Photo 19: A stand of Bulrush and Common Valerian was located along the Alder burn (TN71).

Photo 20: Swamp habitat (TN72) located at the old mining area south of Coalburn

Photo 21: Shallow pond in the vicinity of Coalburn substation (TN73)

Photo 22: An area of *Juncus* & *Carex* spp. swamp was located within a bunded area north of Shoulderigg Road (TN75)

Photo 23: There was a wide area of swamp with *Juncus* vegetation and Bottle Sedge at the pond located north of the spoil heap (TN77).

Open Water

Standing Water

3.2.72 Standing water was present in all sections of the survey area, mainly in the form of ponds. The ponds varied in size, marginal vegetation and surface vegetation, some with Pondweed (*Potamogeton* spp.) such as the settling ponds south of Coalburn village (*Photo 24*). Some ponded areas were enclosed within more swamp like vegetation as described above. A pond in the vicinity of Coalburn substation is shallow and dense with pond vegetation (Photo 25). At the old mining area at Kennoxhead there are many ponds of varying sizes with examples in Photo 26 & Photo 27.

Photo 24: Settling ponds south of Coalburn village with Pondweed (*Potamogeton* spp.)

Photo 25: Shallow pond in the vicinity of Coalburn substation

Photo 26: Many ponds throughout the old mining area at Kennoxhead

Photo 27: A larger pond within the Kennoxhead old mining area

Running Water

3.2.73 Running water was located on all sections of the site and included larger rivers such as the Douglas Water and smaller watercourses such as Poneil Water, Alder Burn, Longhill Burn, Windrow Burn, unnamed burns, tributaries to main rivers such as Kennox Water and ditches.

Rock Exposure and Waste

Cave

3.2.74 A cave known as Wallace's Cave (TN78) was located at NS 82110 33759 and is uphill from the proposed overhead lines.

Spoil

3.2.75 There are mining spoil heaps located on site with the most prominent being north of Coalburn (TN79), which also extends out and down to the surrounding area to the south of this visible heap.

3.2.76 At the Kennoxhead ex-mining area, much of the spoil has been spread out with some bunds evident.

Miscellaneous

Amenity grassland & other

3.2.77 Where there are residential buildings there are some amenity grasslands associated with these. One of the largest areas of amenity grassland is the Hollandbush golf club, north of Coalburn (TN80).

3.2.78 Bare ground is evident within areas of reclaimed mining sections where the vegetation is slower to take hold.

3.3 Invasive Species

3.3.1 Invasive plant species located on site included Japanese Knotweed (*Reynoutria japonica*) (*Photo 28*) and Japanese Rose (*Rosa rugosa*) (Photo 29). These were located along a small watercourse south of Coalburn (TN81 to TN82).

Photo 28: Invasive plant species located on site included Japanese Knotweed (TN81 to TN82)

Photo 29: Invasive plant species located on site included Japanese Rose (TN81 to TN82)

3.4 Habitat assessment for protected animals

Overview

3.4.1 A brief summary of protected species habitat suitability is provided below, however, results of protected species surveys are provided in greater detail in a protected species report (RSK Biocensus, 2020). The protected species report covers all receptors discussed below.

Reptiles

3.4.2 Almost all of the area within 50 m of the route provides suitable habitat for common reptiles, excluding waterbodies, roads and areas of hard standing, although the edges of these could be used for basking. Piles of rubbish and rubble as well as brash piles provide suitable hibernacula for reptiles during winter.

3.4.3 There are two records of common lizard from within the study area as well as within 100 m.

Bats

Roosting

3.4.4 Trees and structures along the route provide potential roosting locations for bats. The cave discussed in the habitats section (section 3.2.74) is well out with 50 m of the working area and is not discussed further here in respect to its potential for roosting bats.

Commuting and foraging

3.4.5 The scrub, woodland, and woodland edge habitats along the route provide good foraging habitat for bats, as well as the Douglas Water and other water courses.

3.4.6 There are records of bats from within 2 km of the study area, these include brown long-eared bat (*Plecotus auritus*), common pipistrelle (*Pipistrellus pipistrellus*), Daubenton's bat (*Myotis daubentonii*), Leisler's (*Nyctalus leisleri*), *Myotis* species, Natterer's bat (*Myotis nattereri*), nyctalus species and soprano pipistrelle (*Pipistrellus pygmaeus*).

Water Voles

3.4.7 A large proportion of the route provides suitable habitat for water voles. This includes the watercourses between Kennoxhead and Carmacoup and the waterbodies and mire between Glespin and Johnshill.

3.4.8 There are records of water vole from within the study area.

Otters

3.4.9 There are several ponds and burns along the route, as well as the Douglas Water, which are suitable for otter.

Badgers

3.4.10 There is suitable sett building habitat along the route including areas of woodland and scrub.

3.4.11 Farmland and woodland provide good foraging opportunities for badger.

3.4.12 There are records of badger from within the study area, as well as from within 2 km of the study area.

Red Squirrel

3.4.13 Areas of woodland along the route provide suitable habitat for red squirrel, including the forestry plantations at NS788268 and NS805345 and the areas of woodland at NS804282 and NS813363.

3.4.14 There is one record of red squirrel from within 2 km of the study area.

Pine Marten

3.4.15 Areas of woodland along the route provide suitable habitat for pine marten, including the forestry plantations at NS788268 and NS805345 and the areas of woodland at NS804282 and NS813363.

3.4.16 No records of pine marten within 2 km of the study area were returned during the BDS.

Other species of principal importance

3.4.17 Large parts of the route provide suitable habitat for brown hare, including areas of grassland, mire and farmland. Areas of woodland, ruderal vegetation and scrub along the route provide suitable habitat for European hedgehog.

3.4.18 There is suitable habitat for amphibians such as common toad along the route.

3.4.19 There is suitable habitat for multiple invertebrate species along the route given the presence of a variety of habitats including woodland, mire, grassland and scrub.

4.0 EVALUATION

4.1 Designated Sites

4.1.1 Given the close proximity of Coalburn Moss SAC and SSSI and Muirkirk and North Lowther Uplands SPA, there is a requirement to undertake a habitat regulations assessment (HRA). If any likely significant effects are identified for these designated sites, mitigation measures and a statement to inform an appropriate assessment will also be needed. In addition, there are several other SSSIs close to the route and if any are to be affected by the development an assent will be required from the statutory authority before works can start.

4.1.2 Given that the footprint of the wooden poles is minimal, and providing that a detailed construction environmental management plan (CEMP) is produced, it is not expected that these sites will be adversely affected by the proposed project. However, detailed mitigation measures in respect to all nearby designated sites will be required.

4.2 Habitats and Plants

4.2.1 Some of the habitats on site are of least concern, such as grazing grassland. However, the dry heaths and bog habitats correlate with Annex 1 habitat types. The condition of these habitats varies as there has been a degree of modification throughout the site and therefore not all instances of community types will constitute an Annex 1 habitat.

4.2.2 Modification has occurred via mining practices, drainage, burning and grazing. The bog habitats condition is also dependent on the depth of peat and if the habitat is 'active'.

4.2.3 'Active' bogs are defined as supporting a significant area of vegetation that is normally peat forming. Typical species include important peat forming species such as Bogmoss (Sphagnum spp.), Cottongrasses (Eriophorum spp.), Purple Moor-grass, and also include Heather and other ericaceous species.

4.2.4 It is possible that deep peat may occur in the vicinity of the bog habitat at NS 80617 35630 and closer to Coalburn Moss SSSI at NS 82234 37136. Due to the small area of the bases of the overhead lines, the loss to good condition bog habitat that is still active can be minimal with effective micro siting and mitigation.

4.2.5 It is essential to ensure that sensitive receptors will not be adversely impacted by the proposal and this can be done through the use of appropriate mitigation measures following current best practice.

4.2.6 The dry heath within the study area was mostly semi-natural as it was derived from cleared mining areas with heath regeneration and continuous modification via grazing and burning regimes.

4.2.7 There are no plant species from the habitats recorded on site that are critically endangered, endangered or vulnerable on the IUCN Red list.

4.2.8 The Scottish Biodiversity List (SBL) identifies habitats that are the highest priority for biodiversity conservation in Scotland. These priority habitats are broad categories and those listed within the survey area are detailed in Table 5: The corresponding phase 1

habitat code, UKBAP priority habitats and corresponding impact according to SBL.with corresponding phase 1 habitat code, UK Biodiversity Action Plan (UKBAP) priority habitats and if conservation action is needed, or to avoid negative impacts according to the SBL.

Table 5: The corresponding phase 1 habitat code, UKBAP priority habitats and corresponding impact according to SBL.

Phase 1 Habitat Code	UK Biodiversity Action Plan (UKBAP) Priority Habitats	Scottish Biodiversity List	Conservation action needed	Avoid negative impacts	Watching brief only
G1 Standing water	Ponds	Ponds	Yes		
G2 Running Water	Rivers	Rivers	Yes		
E1 Bog	Blanket bog	Blanket bog	Yes	Yes	
E2 Flush/spring; E3 Fen; F1 Swamp; B5 Marsh/marshy grassland	Upland flushes, fens and swamps	Upland flushes, fens and swamps			Yes
D1 Dry dwarf shrub heath	Upland heathland	Upland heathland	Yes	Yes	
A1.1.1 Broadleaved woodland - semi-natural	Upland birchwoods	Upland birchwoods	Yes		
A1.1.1 Broadleaved woodland - semi-natural	Wet woodland	Wet woodland	Yes	Yes	

4.3 Invasive Species

4.3.1 If the Japanese Knotweed (*Reynoutria japonica*) and Japanese Rose (*Rosa rugosa*) located along a small watercourse south of Coalburn cannot be avoided during works (works should be in excess of 7 m from any plant), a management plan for these species will be required. However, it is expected that these plants can be avoided as wooden pole locations are likely to span any watercourses.

4.4 Habitats Assessment for protected animals

Reptiles

4.4.1 Almost all of the route provides suitable habitat for common reptiles, however due to the localised nature of the works it is not expected that the project will have a significant effect on these species. Risks to these species can be mitigated by adherence to a method statement for reptiles. This would include details on the appropriate timing of works and supervision of vegetation clearance by a suitably qualified ecologist.

Bats

4.4.2 There are trees and structures along the route which provide potential roosting habitat for bats.

4.4.3 Preliminary roost assessments of trees and structures along the route will be undertaken as part of a protected species walkover (RSK Biocensus, 2020). These surveys will determine if trees or structures may require further surveys.

4.4.4 The overhead line route crosses several possible commuting and foraging corridors for bats. However, given that the loss of trees and hedges will be minimal combined with the small overall footprint of the wooden poles, there is not expected to be any significant effect on foraging and commuting bats by either the construction of the overhead line or once the overhead line is in place.

Water voles

4.4.5 A large proportion of the route is located on suitable water vole habitat. Detailed surveys for water vole will be undertaken as part of a protected species walkover (RSK Biocensus, 2020).

Otters

4.4.6 There are several areas of potential otter habitat along the proposed route, including ponds and the Douglas Water. Detailed surveys for otter will be undertaken as part of a protected species walkover (RSK Biocensus, 2020).

Badgers

4.4.7 There is suitable habitat for badger along the route including woodland and scrub. Detailed surveys for badger will be undertaken as part of a protected species walkover (RSK Biocensus, 2020).

Red Squirrel

4.4.8 There is suitable woodland habitat for red squirrel along the route. Detailed surveys for red squirrel will be undertaken as part of a protected species walkover (RSK Biocensus, 2020).

Pine Marten

4.4.9 There is suitable woodland habitat for pine marten along the route. Detailed surveys for pine marten will be undertaken as part of a protected species walkover (RSK Biocensus, 2020).

Other species of principal importance

4.4.10 There is suitable habitat for brown hare and European hedgehog throughout the route however, as both these species are highly mobile and use multiple resting places throughout their territories, it is not expected that the project will have a significant effect on these species.

4.4.11 There is suitable habitat for common toad throughout the study area, a method statement for reptiles will also help to mitigate for this species and given that there is an abundance of habitat in the area, this species is not expected to be adversely affected.

4.4.12 There is suitable habitat for multiple invertebrate species along the route, however, given the small footprint of the works and the abundance of habitat in the surrounding area, the project is not expected to have a significant effect on any species.

5.0 CONCLUSIONS

5.1.1 A detailed CEMP, including mitigation for invasive species, must be produced to ensure that there is no adverse effect on the adjacent designated sites and an HRA and statement to inform an appropriate assessment is likely to be required in relation the internationally designated sites. These documents must be submitted to the relevant competent authority.

5.1.2 All wetland features (surface and running water) should be protected, especially during the construction phase as this is when sensitive habitats are at most risk from site traffic, soil/water runoff and potential pollutants. All mitigation measures should follow the principles of avoidance, reduction and remedy. However, where avoidance is not possible then consideration should be given to local re-alignment of the route to minimize the extent of impact. This will involve site-specific measures to protect small hydrological features, sensitive vegetation and woodland communities.

5.1.3 Given the common habitats and the modified condition of some bog habitats and grassland slopes it is considered that the proposal would have a low magnitude of impact with construction best practice techniques.

5.1.4 A more detailed national vegetation classification (NVC) and ground water dependent terrestrial ecosystems (GWDTE) report will accompany the phase 1 broad habitat report.

5.1.5 A method statement for reptiles should be produced prior to works commencing on site, including site investigation works.

5.1.6 Detailed surveys for the following protected species will be undertaken:

- ground level tree assessment of trees for bat roost potential;
- preliminary roost assessment of structures for bat roost potential;
- badger survey;
- pine marten survey;
- red squirrel survey;
- otter survey; and
- water vole survey.

5.1.7 Ecological surveys of any new access tracks and laydown areas etc should be undertaken when their location is known and prior to any construction works in these areas.

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FIGURES

Figure 1: Phase 1 habitat map

277500 278000 278500

626500 626000 625500

Legend:

- Allignment
- Structure
- Coniferous Semi-natural Woodland
- Coniferous Plantation Woodland
- Recently Felled Coniferous Woodland
- Improved Grassland
- Marshy Grassland
- Blanket Bog
- Modified Bog
- Acid / Neutral Flush
- Bare Peat
- Standing Water
- Swamp
- Tall Ruderal Vegetation
- Bare Ground / Hardstanding
- Running Water
- Ditch
- Dry Ditch
- Scattered Coniferous Trees
- Stone Pile
- Target Note

Rev	Date	Description	Dm	Chk	App
00	22/10/2020	2480372	RG	SP	RM

Kennoxhead OHL

RSK biocensus
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Figure 1
Phase 1 Map
Map 1 of 11

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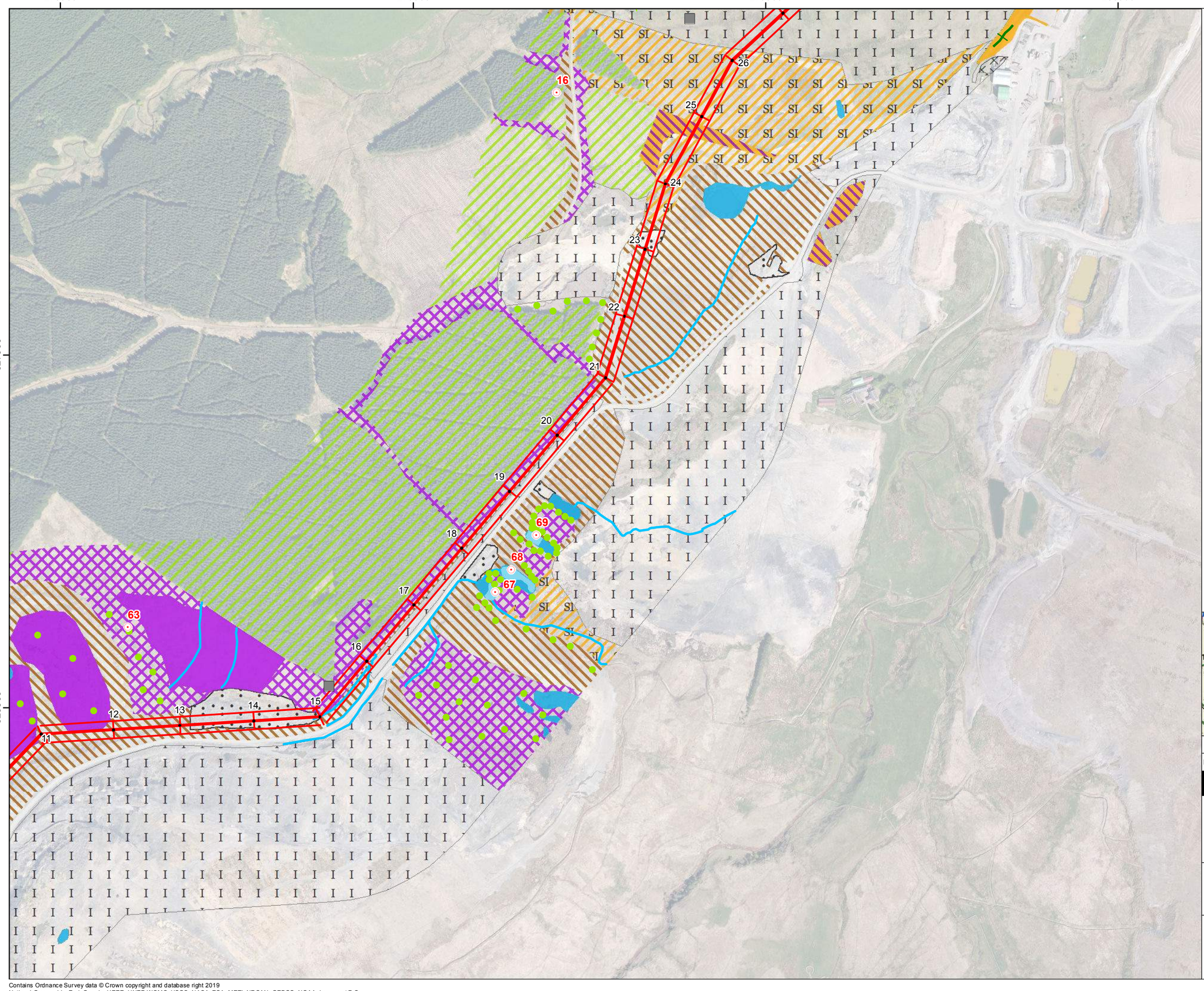

Legend:

- Allignment
- Structure
- Coniferous Plantation Woodland
- Semi-improved Acid Grassland
- Neutral Grassland
- Improved Grassland
- Marshy Grassland
- Blanket Bog
- Modified Bog
- Standing Water
- Swamp
- Tall Ruderal Vegetation
- Ephemeral / Short Perennial
- Bare Ground / Hardstanding
- Broad-leaved Hedge / Tree-line
- Ditch
- Scattered Coniferous Trees
- Stone Pile
- Target Note

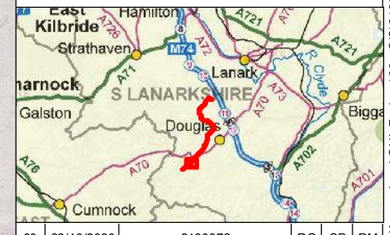

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Figure 1
Phase 1 Map
Map 2 of 11

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279500 280000 280500

628500 628000 627500

Legend:

- Allignment
- Structure
- Broadleaved Semi-natural Woodland
- Broad-leaved Plantation Woodland
- Coniferous Plantation Woodland
- Dense Scrub
- Semi-improved Acid Grassland
- Neutral Grassland
- Semi-improved Neutral Grassland
- Improved Grassland
- Marshy Grassland
- Modified Bog
- Standing Water
- Tall Ruderal Vegetation
- Continuous Bracken
- Amenity Grassland
- Broad-leaved Hedge / Tree-line
- Coniferous Hedge / Tree-line
- River
- Running Water
- Ditch
- Scattered Broad-leaved Trees
- Scattered Coniferous Trees
- Stone Pile
- Target Note

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EXPERTS IN ECOLOGY

Figure 1
Phase 1 Map
Map 3 of 11

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280500 281000 281500

629500 629000 628500

Legend:

- Allignment
- Structure
- Broadleaved Semi-natural Woodland
- Mixed Semi-natural Woodland
- Coniferous Plantation Woodland
- Dense Scrub
- Semi-improved Acid Grassland
- Improved Grassland
- Marshy Grassland
- Wet Dwarf Shrub Heath
- Modified Bog
- Acid / Neutral Flush
- Standing Water
- Continuous Bracken
- River
- Running Water
- Ditch
- Scattered Broad-leaved Trees
- Target Note

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Figure 1
Phase 1 Map
Map 4 of 11

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281000 281500 282000

631000 630500 630000

Legend:
- Allignment
- Structure
- Broadleaved Semi-natural Woodland
- Broad-leaved Plantation Woodland
- Coniferous Plantation Woodland
- Semi-improved Acid Grassland
- Improved Grassland
- Marshy Grassland
- Wet Dwarf Shrub Heath
- Acid / Neutral Flush
- Standing Water
- Swamp
- Continuous Bracken
- Running Water
- Ditch
- Scattered Broad-leaved Trees
- Target Note

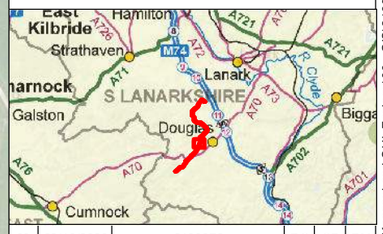

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Figure 1
Phase 1 Map
Map 5 of 11

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632000

631500

Legend:

- Allignment
- Structure
- Broadleaved Semi-natural Woodland
- Broad-leaved Plantation Woodland
- Mixed Plantation Woodland
- Coniferous Plantation Woodland
- Dense Scrub
- Semi-improved Acid Grassland
- Semi-improved Neutral Grassland
- Improved Grassland
- Marshy Grassland
- Wet Dwarf Shrub Heath
- Wet Heath / Acid Grassland
- Standing Water
- Tall Ruderal Vegetation
- Ephemeral / Short Perennial
- Bare Ground / Hardstanding
- Broad-leaved Hedge / Tree-line
- Running Water
- Ditch
- Old Stone Dyke Boundary
- Scattered Broad-leaved Trees
- Target Note

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Figure 1
Phase 1 Map
Map 6 of 11

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