

# Ecology & Biodiversity

## Relevant Policy and Guidance

The following list covers the main guidance documents that will be referred to with respect to terrestrial ecology:

- Chartered Institute of Ecology and Environmental Management (CIEEM) (2018). Guidelines for ecological impact assessment in the UK and Ireland. Version 1.1.
- Scottish Natural Heritage (SNH) (2012). Assessing the cumulative impact of onshore wind energy developments.
- SNH (2018). General pre-application/ scoping advice to developers on onshore wind farms.
- Scottish Environment Protection Agency (SEPA) (2017). Land use planning guidance note LUPS-31: Guidance on assessing the impacts of development proposals on ground water abstractions and ground water terrestrial ecosystems.
- SNH et al. (2019). Bats and onshore wind turbines - survey, assessment and mitigation.

## Baseline

The following ecology surveys and desk-based studies were undertaken in 2018-19 and a summary of the methods used and key findings is provided in the following paragraphs:

- Ecology desk study (including review of surveys previously undertaken at the site in 2013);
- Vegetation surveys (National Vegetation Classification (NVC) and Phase 1);
- Protected mammal survey (excluding bats);
- Fish habitat survey; and
- Bat surveys.

The survey area for fish habitats, protected mammals and vegetation was the area within the application boundary plus a 250 m buffer area along the application boundary to the northwest of Polskeoch roughly between Altry Hill and Meikledodd Hill. No access was permitted for surveys out with the application boundary in other areas. Surveys were completed in October 2019.

Ground level, automated bat detector surveys were undertaken in the Euchanhead area between May and September 2018 and in the Polskeoch area in 2019.

## Desk Study

### *Protected and notable species*

Desk study data (from the local records centre and relevant ecological reports for nearby development proposals) included records for the following protected or notable species from within 2 km of the application boundary:

- Eight species of mammals, including the legally protected species otter, water vole, badger, pine marten and red squirrel;
- At least eight species of bat (within 10 km of the application boundary), including common pipistrelle, soprano pipistrelle, noctule and Leisler's, all of which are considered to be at high risk from wind turbines under current guidelines;
- Three species of reptile, common lizard, slow-worm and adder;
- Two species of fish, Atlantic salmon and brown trout;
- Twenty-one species of insect, in particular species reliant on wetland and heath habitats;

- Two species of plant, juniper and field gentian; and
- Ten species of lichen/ lungwort.

Surveys for great crested newt were carried out in the area in 2007 during the EIA for the South West Scotland interconnector project and in 2013 for an earlier proposal on the Site, however no great crested newts were found.

### Designated sites

Statutory designated sites of nature conservation importance within 10 km of the application boundary are summarised in Table 1 and include:

- The Muirkirk and North Lowther Uplands Special Protection Area (SPA), this is designated only for its ornithological interest and therefore is not relevant in terms of non-avian ecology;
- Mennock Water Site of Special Scientific Interest (SSSI) is designated for wetland habitat associated with riparian zones however this site is upstream of the Euchanhead so there is no hydrological connectivity with the Site.

Other sites listed in Table 1 are designated for ornithology interest, which are not of relevance to the ecology EIA and terrestrial habitats (woodland, juniper and upland habitats).

Table 1: Statutory Designated Sites

| Name                               | Designation | Distance to Site Boundary (km) | Direction from Site | Qualifying Features Summary   |
|------------------------------------|-------------|--------------------------------|---------------------|---|
| Muirkirk and North Lowther Uplands | SPA         | 6.38 (to nearest area)         | NE                  | Golden plover, hen harrier, merlin, peregrine and short-eared owl.                        |
| Upper Nithsdale Woods              | SAC         | 4.93 (to nearest area)         | E                   | Multiple small areas of mixed woodland on base-rich soils associated with rocky slopes.   |
| Tynron Juniper Wood                | SAC         | 9.66                           | SE                  | Juniper on heaths or calcareous grasslands.   |
| Back Wood                          | SSSI        | 7.33                           | NE                  | Upland oak woodland   |
| Mennock Water                      | SSSI        | 8.08                           | NE                  | Fen meadow and Upland oak woodland  |
| Stenhouse Wood                     | SSSI        | 6.78                           | SE                  | Upland mixed ash woodland   |
| Tynron Juniper Wood                | SSSI        | 9.66                           | SE                  | Juniper scrub   |
| North Lowther Uplands              | SSSI        | 6.38                           | NE                  | Breeding bird assemblage, hen harrier and upland habitats.                                |
| Chanlockfoot                       | SSSI        | 4.93 (to nearest area)         | E                   | Mixed woodland on base-rich soils associated with rocky slopes                            |
| Muirkirk Uplands                   | SSSI        | 8.27                           | N                   | Blanket bog, breeding bird assemblages, hen harrier, short eared owl and upland habitats. |

### Ancient Woodland

There are a number of areas of woodland in the area surrounding the Site that are listed on the Ancient Woodland Inventory (AWI), the closest is within 132 m of the application boundary, however none are within the application boundary.

### Local Wildlife Sites and Other Non-Statutory Designations

Two Local Wildlife Sites (LWS) are within 2 km of the Site boundary: Glenmaddie Wood LWS (2 km downstream of the Site on either side of the Euchan Water), and Afton Uplands Provisional LWS (adjacent to the north western edge of the Polskeoch area). In addition, the Site and 2 km buffer area is entirely overlapped by the Galloway and Southern Ayrshire Biosphere reserve, and all forestry within the Site are former red squirrel priority woodlands. Whilst these areas have now been superseded in terms of strategic priorities by the Red Squirrel strongholds, these sites indicate habitats considered to be of local importance for Red Squirrels.

### Vegetation

Surveys were completed following methods outlined in the Handbook for Phase 1 Habitat Surveys<sup>1</sup> and National Vegetation Classification (NVC) User's Handbook<sup>2</sup>. The potential for groundwater dependency was identified via NVC survey in line with SEPA LUPS guidance<sup>3</sup>.

The 2,456 hectare (ha) survey area supports over 2,000 ha of coniferous plantation or recently-felled coniferous plantation. These areas and other highly modified habitats such as improved grassland were not subject to NVC survey.

The Phase 1 and NVC survey results show that the remainder of the survey area is predominantly covered with acid grassland and peatland habitats, including blanket bog, wet and dry modified bog, and marshy grassland communities. In addition, there are smaller areas of wet and dry heath, semi-improved neutral grassland and bracken present. Of the peatland habitats, only less modified, more Sphagnum rich bog community polygons were classed as blanket bog (55.86 ha) with the rest being attributed to marshy grassland (38.37 ha) and wet (7.94 ha) or dry (23.75 ha) modified bog.

The locations of potential Groundwater Dependent Terrestrial Ecosystem (GWDTE) habitats were mapped based on the NVC data, as per Scottish Environment Protection Agency (SEPA) guidance. It must be stressed that the NVC survey is only able to identify communities which are potentially groundwater dependent and in practice some of the areas may not actually represent GWDTEs. Current SEPA guidance states that, *"if any GWDTEs are located within a radius of (i) 100 m from roads, tracks and trenches or (ii) 250 m from borrow pits and foundations the likely impact of these features will require further assessment"*. Further assessment of potential GWDTEs will be presented in the Hydrology, Hydrogeology, Geology and Soils chapter of the EIA Report.

### Protected Mammals (Excluding Bats)

A Site walkover was undertaken looking for signs of protected mammals in line with standard methodologies<sup>4</sup>. Along watercourses the walkover was completed for otter and water vole at the same time as fish habitat surveys.

The Site offers suitable habitat for a range of protected mammal species including otter, water vole, badger, red squirrel and pine marten. Evidence of pine marten activity, including a potential den or resting site, was widespread within the survey area.

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<sup>1</sup> Joint Nature Conservation Committee. 2010. Handbook for Phase 1 habitat survey: a technique for environmental audit. JNCC, Peterborough.

<sup>2</sup> Rodwell, J. S. 2006. National Vegetation Classification: Users' handbook. JNCC, Peterborough: <http://data.jncc.gov.uk/data/a407ebfc-2859-49cf-9710-1bde9c8e28c7/JNCC-NVC-UsersHandbook-2006.pdf>

<sup>3</sup> SEPA. 2014. Land use planning system SEPA guidance note 31. Guidance on assessing the impacts of development proposals on groundwater abstractions and ground water dependent terrestrial ecosystems.

<sup>4</sup>

- Ward D, Holmes N and José P (1994) *The New Rivers and Wildlife Handbook*. RSPB, Bedfordshire.
- Bang, P. and Dahlstrom, P. (2001) *Animal Tracks and Signs*. Oxford University Press.
- Dean, M., Strachan, R., Gow, D. and Andrews, R. (2016). *The Water Vole Mitigation Handbook (The Mammal Society Mitigation Guidance Series)*. Eds Fiona Mathews and Paul Chanin. The Mammal Society, London. <https://assets.sussexwildlifetrust.org.uk/water-vole-mitigation-guidance-2016.pdf>
- Neal E. and Cheesman C. (2006) *Badgers*. Poyser Natural History, Cambridge, UK.
- Bang, P. & Dahlström, P. 2001. *Animal Tracks and Signs*. Oxford University Press, Oxford

The majority of squirrel evidence was observed within the Polskeoch area, although chewed cones were also found in the Euchanhead area. No dreys were found during the surveys, this is likely due to low squirrel densities on site and the densities of trees which limited access to coupe interiors, rather than the absence of any dreys. Based on the habitat present and following a precautionary approach it is assumed that all squirrel signs are of red squirrel.

Evidence of otter activity was recorded on five of the watercourses surveyed indicating that otter activity is widespread along suitable watercourses in this area, although no holts or other resting places were recorded.

No signs of water vole or badger were recorded during the surveys, but these results do not necessarily preclude the possibility of these species being present within the application boundary. Badger, and water vole if present, may be at very low density or only use the Site occasionally.

### **Fish habitats**

The fish habitat survey was undertaken by Nith District Salmon Fisheries Board, along watercourses following the standard Scottish Fisheries Coordination Centre methodology.

This study identified presence of habitat that is suitable for sustaining salmonid species of fish in the Euchan Water, Shinnel Water, Scaur Water and Water of Ken catchments. Archive fisheries data on some of these watercourses proves the above statement for those watercourses. The study also noted that American signal crayfish are known to be present in the Ken catchment, although white-clawed crayfish are very unlikely to be present at Euchanhead or the surrounding area (NDSFB, pers. comm.). No freshwater pearl mussels were noted during the survey however habitat favoured by freshwater pearl mussels was present in most of the watercourses.

### **Bats (Euchanhead Area 2018)**

A daytime assessment of the Site was conducted in April 2018. During the walkover assessment no suitable roosting locations were found for bats.

Ground level automated recorders (AnaBat Express bat detectors with omni-directional microphone) were positioned at nine locations throughout the site for a minimum of 30 nights per season (spring, summer and autumn) totalling 810 nights of data. The detectors recorded between sunset and sunrise. The detectors were placed in the vicinity of indicative turbine locations. These surveys were completed before the 2019 SNH guidance requiring full spectrum detectors and collection of weather data was issued. However, with the exception of the detector type used, the surveys are largely compliant with the 2019 guidance and recorded for three times as many nights as recommended in the 2019 guidance (30 nights per season rather than 10 nights per season). The 2018 survey data are therefore considered to be suitable for use in the EIA.

Most bat activity recorded was during the summer (1.42 Bat Passes per Hour (BPpH)), with lower levels in the spring (0.08 BPpH) and the lowest in the autumn (0.01 BPpH). The higher levels of activity during summer could have been due to the increased insect activity which will have been associated with warmer weather conditions.

The most commonly encountered species was soprano pipistrelle, followed by common pipistrelle. The pipistrelle species accounted for 92.46% of the total bat passes. *Myotis* sp., *Nyctalus* sp (i.e. Leisler's or noctule) and brown long-eared bats were recorded much less frequently, with *Myotis* accounting for 4.35%, *Nyctalus* for 1.94% and brown long-eared for 1.15% of the total bat passes.

### **Bats (Polskeoch Area 2019)**

A habitat and potential roost assessment of the survey area was carried out in May 2019. Four structures with the potential to support roosting bats were recorded: Polskeoch Bothy, Tin Hut and Polskeoch Farmhouse and Garage. The assessment followed the methodology detailed in Collins (2016)<sup>5</sup> and comprised an inspection of all accessible areas of the structures to identify features likely to be used by roosting bats.

Dusk emergence and dawn re-entry surveys were completed on the four buildings with roost potential in August and September 2019. These surveys found three roosts: a soprano pipistrelle maternity roost (the Bothy), and two non-breeding pipistrelle species bat roosts (the Bothy and the Farm House); and a potential brown-long eared bat (1 individual) roost at (the Bothy), this bat was seen but not picked up on the acoustic detectors so species is not certain. The south east of the bothy was found to support a maternity roost for soprano pipistrelle bats with a peak count of 83.

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<sup>5</sup> Collins, J. (ed.) (2016) Bat surveys for professional ecologists: Good practice guidelines (3rd edn). The Bat Conservation Trust, London: [https://cdn.bats.org.uk/pdf/Resources/Bat\\_Survey\\_Guidelines\\_2016\\_NON\\_PRINTABLE.pdf?mtime=20181115113931](https://cdn.bats.org.uk/pdf/Resources/Bat_Survey_Guidelines_2016_NON_PRINTABLE.pdf?mtime=20181115113931)

Bat activity surveys were undertaken between May and October 2019. Static detectors were deployed at 13 locations; 11 on Polskeoch and a further two on open ground northwest of Euchanhead. Activity was recorded using a mix of Song Meter SM2BAT (recording in full spectrum) and Anabat Express (recording in zero-crossing) detectors (the mix of detector types was agreed with SNH prior to survey). Static detectors were deployed for a minimum of 10 nights in each of: spring, summer and autumn. The daily weather data for the static recording deployment periods were provided from the SPR met mast at Eliock weather station (approximately 4.5 km west of Euchanhead). Daily rainfall was collected from the Scottish Environment Protection Agency (SEPA) rainfall data website.

Static detector surveys identified the presence of a minimum of six species of bats: common pipistrelle, soprano pipistrelle, Daubenton's, Leisler's, noctule and brown long-eared bats, with peak activity during the autumn dispersal/mating season.

### **Proposed Additional Baseline Work**

As water levels were very high at the time of the October 2019 survey it is possible that otter and water vole signs were either submerged or had been washed away. On that basis and given also that the water vole survey was slightly later in the season than their peak activity period (April to September), a second water vole and otter survey will be undertaken in spring 2020 to inform the EIA. As direct impacts to water vole and otter are only likely within 250 m of proposed infrastructure, this survey will be limited to within 250 m of potential infrastructure locations (if known at the time of survey). Survey would take place following the same methodology used in 2019.

Freshwater habitats within the survey area may be suitable for freshwater pearl mussel (FWPM). It is therefore proposed to undertake surveys for this species, in the vicinity of proposed water crossing locations (once known), as water crossing construction is the only aspect of the proposed Development likely to result in direct impacts on FWPM, assuming water quality is protected. Surveys would either take place: a) as per SNH guidance (Freshwater Pearl Mussel Survey Protocol for use in site-specific projects), which involves field searches within suitable FWPM habitat 0.1 km upstream and 0.5 km downstream of proposed crossing locations, in low flow conditions, under licence, between April and September; or b) by eDNA sampling. We would welcome consultee views on this.

No other surveys are considered necessary to inform the EIA, although some further surveys such as electro-fishing surveys and pre-construction checks for protected species are anticipated to be required prior to construction, should the project be consented.

At this stage we do not anticipate that infrastructure will be placed closer than 250 m from the edge of the area surveyed, and therefore consider that the extent of the survey area is sufficient. However, should infrastructure be placed closer than 250 m from the application boundary where the 250 m site buffer has not been surveyed, then we propose to undertake top-up surveys within 250 m (access permitting).

The access route to the Site is still being investigated and surveys and assessment may be required, depending on the location of the route and whether it is entirely located on existing tracks or whether new track construction is required. The scope of survey work and assessment required can only be determined once the location of the access route has been confirmed.

### **Potentially Significant Effects**

#### **Construction**

Avoidance of important habitats and resting places for protected/notable species, along with the implementation of good practice mitigation measures to prevent disturbance of protected mammals and protect water quality and GWDTE, will limit the potential for significant negative effects on ecological features during construction. However, until the proposed Development layout has been finalised and the assessment is completed, it is not known whether significant effects are likely. Potential negative effects during construction include but are not limited to:

- Permanent/temporary loss of important habitats and/or habitats used by protected species;
- Disturbance to protected/notable species; and
- Pollution to watercourses and associated impacts on aquatic species.

The proposed Development is also likely to result in positive effects through the implementation of a Habitat Management Plan (HMP). The scope of any HMP will be determined during the EIA process and a Draft HMP will be provided with the EIA Report.

### Operation

Avoidance of important habitats for protected/notable species, along with the implementation of good practice mitigation measures to prevent disturbance and protect water quality, will limit the potential for significant negative effects on ecological features during operation. However, until the proposed Development layout has been finalised and the assessment is completed, it is not known whether significant effects are likely. Potential operational effects may include but are not limited to:

- Bat mortality due to collision with turbines (or Barotrauma);
- Disturbance to protected or notable species during operation and maintenance work or mortality to such species due to, e.g. traffic collisions; and
- Pollution to watercourses and associated impacts on aquatic species.

### Matters to be Scoped Out

We propose to scope out the following from further survey to inform the EIA:

- Reptiles, amphibians and invertebrates (with the exception of European Protected Species (EPS)) – based on SNH's general guidance for windfarm developers it is not proposed to survey for these species to inform the EIA. With standard mitigation measures in place these species are unlikely to experience a significant effect during construction/ operation of onshore windfarms.
- Great Crested Newt is an EPS, a desk study and habitat suitability assessment of pools on site has been undertaken for this species. There are no local records for the species, despite surveys having been undertaken and only low suitability habitat on site. GCN is therefore very unlikely to be present and no further surveys for GCN are considered necessary.
- It is proposed to assess potential impacts to fish based on historic records and habitat suitability, therefore detailed fish surveys are not considered necessary to inform the EIA.

We propose to scope out the following from the terrestrial ecology assessment in the EIA:

- Impacts on statutory designated sites; and
  - The Muirkirk and North Lowther Uplands SPA is designated only for its ornithological interest and therefore is not relevant in terms of non-avian ecology;
  - Menzies Water SSSI is designated for wetland habitat associated with riparian zones however this site is upstream of the Euchanhead so there is no hydrological connectivity with the Site; and
  - Other designated sites within 10 km (Upper Nithsdale Woods SAC, Tynron Juniper Wood SAC/ SSSI, Back Wood SSSI, Stenhouse Wood SSSI, North Lowther Uplands SSSI, Chanlockfoot SSSI, Muirkirk Uplands SSSI) are designated either for their ornithology interest (which is not relevant to non-avian ecology or terrestrial habitats (woodland, juniper and upland habitats), which given the intervening distances are not likely to be affected by the proposed Development.
- Impacts on Ancient Woodland: as there is no ancient woodland on site, and as ancient woodland is a terrestrial habitat and given the intervening distance, ancient woodland outwith the application boundary is not considered to be ecologically connected with the Site and is therefore not likely to be affected by the proposed Development.

### Consultee Questions

- Please confirm that you are satisfied with the level of ecological survey effort undertaken/ proposed for EIA purposes?
- Please confirm that you are satisfied with the surveys proposed to be scoped out and features proposed to be scoped out of detailed consideration within the EIA?
- Please confirm if you consider eDNA sampling for freshwater pearl mussel to be an acceptable alternative to traditional searches as per SNH guidance.
- Please confirm any additional requirements that you consider should be included in this element of the EIA, that have not been covered in this fact sheet.



