

Fisherplace Hydro, Thirlmere
Preliminary Ecological Appraisal



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Declaration of Compliance

This Preliminary Ecological Appraisal has been undertaken in accordance with British Standard 42020:2013 “Biodiversity: Code of practice for planning and development” (BSI 2013), the CIEEM Guidelines for Preliminary Ecological Appraisal (CIEEM 2017a) and Ecological Impact Assessment (CIEEM 2016). The information has been prepared and provided in compliance with the CIEEM’s Code of Professional Conduct (CIEEM 2019) and Guidelines for Ecological Report Writing (CIEEM 2017b).

PBA Applied Ecology Ltd
 New Croft
 Stackhouse Lane
 Giggleswick
 Settle
 North Yorkshire
 BD24 0DL
 t. 01729 822063
 e. enquiries@pba-ecology.co.uk
www.pba-ecology.co.uk

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KEY FINDINGS

This Preliminary Ecological Appraisal (PEA) report assesses the ecological baseline conditions at Fisherplace Hydro and identifies any potential ecological constraints to the proposed catchment extension of the current hydroelectric station. A desktop study of site attributes and an 'extended' habitat survey based on UK Habitat Classifications were conducted to identify features of apparent or potential ecological significance at the site. Potential ecological impacts from the proposed extension are assessed, and recommendations made for limiting these impacts.

Designated Sites

Statutory sites within 2 km of the proposed works include the SSSIs River Derwent and Tributaries, Thirlmere Woods, and Helvellyn & Fairfield, as well as the SACs Lake District & High Fells and River Derwent & Bassenthwaite Lake.

Habitats & Species

Habitats present within the project site include upland mixed woodland classified as temperate rainforest (w1b 25), bracken (g1c), upland flushes, fens, and swamps (f2c), blanket bog (f1a), and upland acid grassland (g1b).

A robin was observed during the survey, and surrogate signs of field vole and rabbits were recorded. Fish blockers were found within the water course that will block migratory fish. However, there is suitable habitat for resident fish populations within the upper half of the dewatered section. The bryophytes found on site were identified and found not to be nationally rare or scarce species (Pescott 2016).

No Invasive Non-Native Species (INNS) were identified within the project site.

Recommendations

Based on the findings of this PEA, the following recommendations for future monitoring, management, and/or mitigation are made:

- Pollution prevention and sediment control to be detailed within a Surface Water Management Plan, incorporated into method of works, and fully implemented.
- Biosecurity procedures to be detailed within a Biosecurity and INNS Plan and method of works.
- BNG became mandatory as of January 2024, however the development may be exempt as less than 5 m of linear river habitat will be impacted. The local planning authority should determine whether the project is exempt from BNG.
- Ideally sensitive habitats will be avoided, or disturbance to them will be minimised as much as possible.
- An Ecological Impact Assessment may be required to determine if the woodland will be impacted by the development.
- A fish eDNA survey should be completed in the headwaters that will be dewatered to determine if it is used by resident fish populations.
- River work should be completed within the in-river working season (15th June – 30th September).
- A precautionary fish rescue should be undertaken prior to any in-river works.
- Appropriate pollution prevention measure will be required such as silt curtains and or sediment fencing.

- Vegetation clearance works should be timed to avoid the nesting bird season which runs from March to August inclusive.
- Any long vegetation will require a two-stage vegetation clearance. The grass should be strimmed down to 10 cm. A hand search for reptiles should be completed by an ecologist and following this the vegetation should be cut as low as possible.
- Strict biosecurity measures should be adhered to including the washing of all equipment (boots, machinery etc) on arrival to, and removal from, site.

1. INTRODUCTION

1.1. TERMS OF REFERENCE

PBA Applied Ecology Ltd (PBA) was commissioned by Ellergreen Hydro to undertake a Preliminary Ecological Appraisal (PEA), bryophyte survey, and fish habitat assessment at Fisherplace Hydroelectric Station, Thirlmere, Keswick, Cumbria. This report assesses the ecological baseline conditions at the site and identifies any potential ecological constraints to the proposed project. The objectives of the ecological appraisal were to:

- Determine the types of habitats present within the project site,
- Determine the current condition / quality of habitats present within the project site,
- Identify any protected / notable species which are present or potentially present on site,
- Identify likely constraints and assess potential impacts of the proposed works,
- Highlight any further survey work which may be required,
- Provide recommendations for avoidance, minimisation, and mitigation of ecological impacts from the proposed works.

The level of detail in this appraisal and report is intended to be proportionate to the scale of the project and complexity of its potential impacts.

Unless stated otherwise, the information provided within this report is valid for a maximum period of 24 months from the date of survey. If works at the site have not progressed by this time, an updated site visit may be required to determine any changes in site condition or ecological constraints.

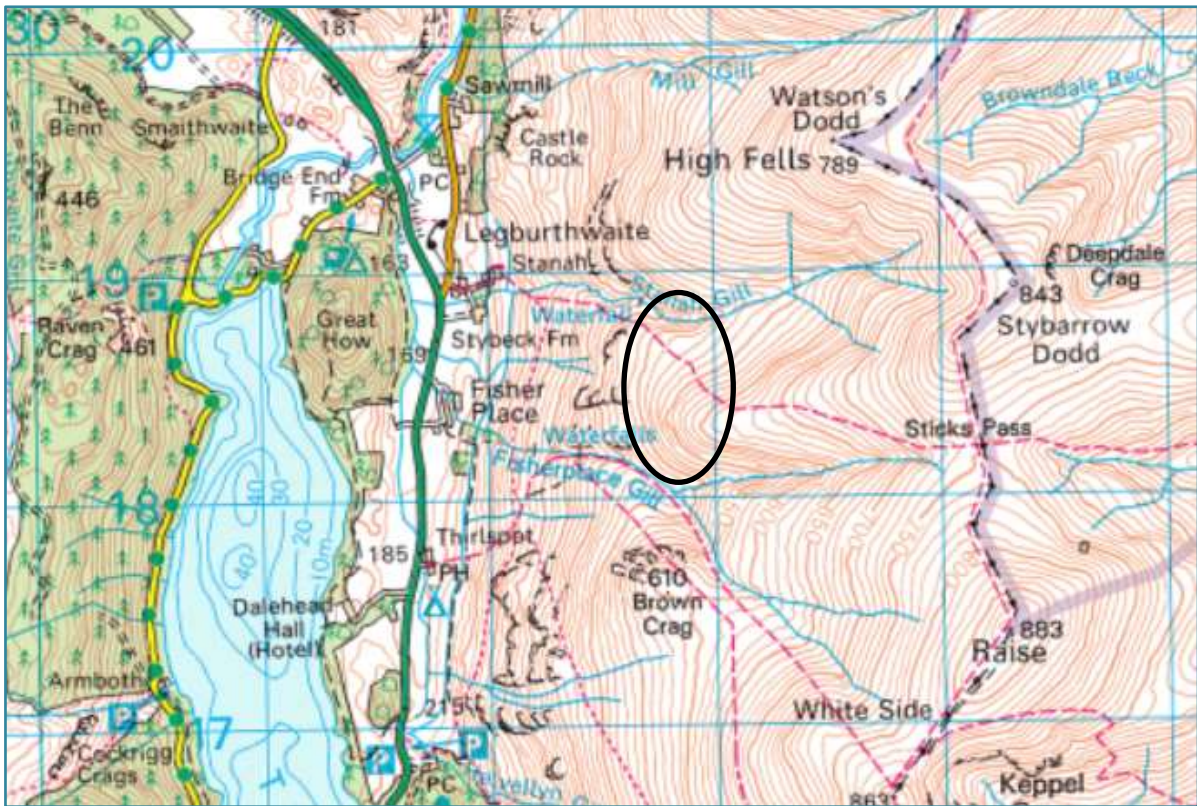


Figure 1: Site location (Bing Maps, 2024).

1.2. SITE DESCRIPTION AND CONTEXT

The project site is located at Fisherplace Gill, near Fisherplace, Thirlspot, Keswick, Cumbria (NY 32531 18190, Figures 1 & 2). The site comprises a mosaic of open montane habitats between Stanah Gill to the north and Fisherplace Gill to the south.

The wider landscape is occupied by Thirlmere reservoir to the west and the lower slopes of the Helvellyn mountain range to the east and west. Downstream of site, Fisherplace Gill flows through a series of waterfalls before entering an existing aqueduct that runs parallel with the east shore of Thirlmere. Water is diverted from the beck into the existing hydroelectric powerhouse, located at NY 31960 18355, before being discharged back along the aqueduct. The surrounding habitat largely comprises grassland with areas of riparian woodland associated with watercourses running towards Thirlmere (Figures 1 & 2).

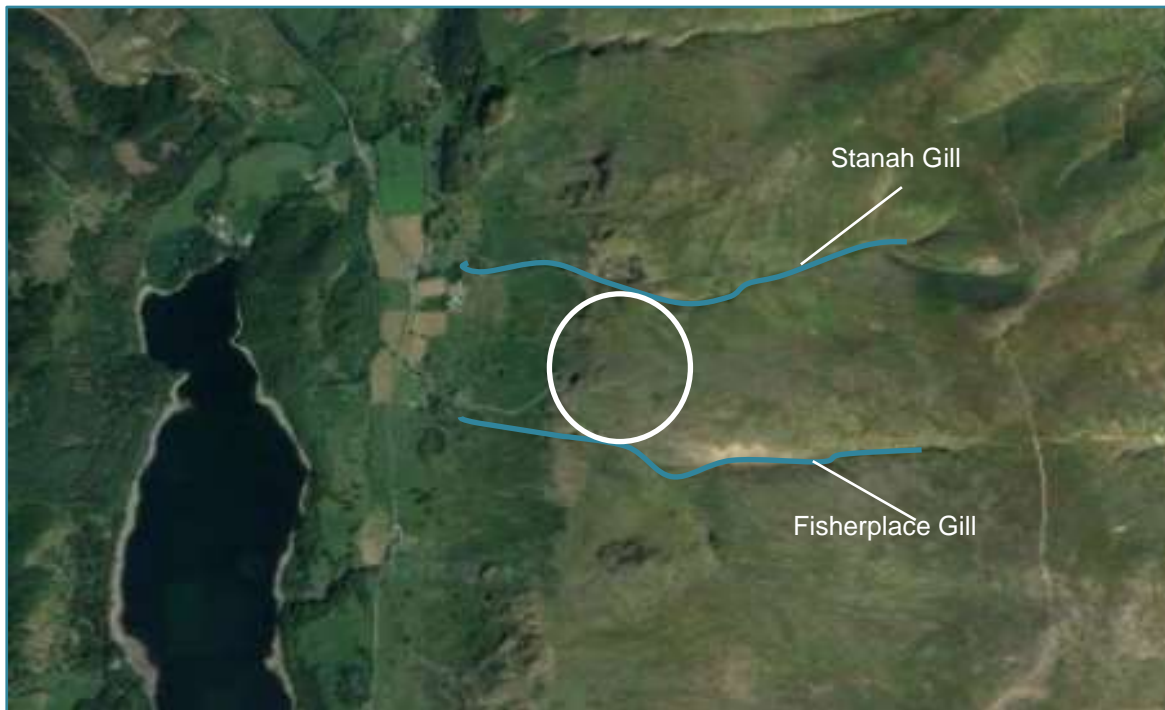


Figure 2: Site context (Google Maps, 2024).

1.3. DESCRIPTION OF WORKS

The aim of the proposed project is to extend the catchment of the existing Fisherplace Hydro Electric Station to include input from the nearby Stanah Gill. The works to carry out the extension are expected to include:

- The construction of a small concrete weir as an intake stump across Stanah Gill, incorporating a Coanda screen with 1 mm apertures. Intake to include floating notch hands off flow orifice, and waterfront sluice gate.
- 610 m buried pipeline with an external diameter of 315 mm, reduced to a 250 mm pipeline running for a further 320 m.
- Underground connection to the existing hydro pipeline downstream of the existing Fisherplace intake.

1.4. WILDLIFE LEGISLATION AND PLANNING POLICY

This PEA has been undertaken with reference to relevant environmental and wildlife legislation and planning policy. Key international and national legislation considered within the scope of this document includes:

- EC Habitats Directive 1992 (Council Directive 92/43/EEC)
- Wildlife and Countryside Act 1981 (as amended)
- Countryside and Rights of Way Act 2000
- Natural Environment and Rural Communities Act 2006
- The Conservation of Habitats and Species Regulations 2017 (as amended)
- Protection of Badgers Act 1992
- Hedgerow Regulations 1997
- Environmental Protection Act 1990
- Salmon and Freshwater Fisheries Act 1975
- National Parks and Access to the Countryside Act 1949

The most recent amendments to the Conservation of Habitats and Species Regulations 2017 take account of the UK's exit from the European Union. These amendments are found in the Conservation of Habitats and Species (amendment) (EU Exit) Regulations 2019.

In addition to obligations under wildlife legislation, the preservation of biodiversity is also a material consideration in planning decisions. Biodiversity 2020: A Strategy for England's Wildlife and Ecosystem Services, sets the Government's main objective for protecting UK biodiversity as *"to halt overall biodiversity loss, support healthy well-functioning ecosystems and establish coherent ecological networks, with more and better places for nature for the benefit of wildlife and people."* (DEFRA 2011). In addition, the National Planning Policy Framework 2012 promotes decision-making with a presumption in favour of sustainable development and requires planning decisions to *"contribute to and enhance the natural environment"*, including *"minimising impacts on biodiversity and providing net gains in biodiversity where possible"* (Appendix A). As such, incorporating measures to protect, mitigate, and enhance biodiversity are important aspects of project design.

Further information on legislation and policy is provided later in this report (Section 5 - Evaluation), as well as in Appendix A, which describes the levels of protection granted to the species and habitats identified within the project site.

2. APPROACH

This PEA is based on a desktop study of site attributes, followed by an 'extended' habitat survey conducted in the field. The extension of the standard habitat mapping survey based on UK Habitat Classification (UKHC; UK HCWG 2023) is intended to highlight additional features of apparent or potential ecological significance, specifically in relation to habitats present on the site which have the potential to support notable or protected species (CIEEM 2017a). The fieldwork to support this PEA was undertaken on 12th December 2023 by Neil Wilkinson MSc ACIEEM, Andrew Macaulay BSc ACIEEM, Rachel Edgar BSc, and Sarah Barker.

2.1. DESKTOP STUDY

The Natural England online facility 'Magic Map' was used to obtain information on local, national, and international designations, including statutory wildlife sites (e.g., SSSI, SPA, SAC) within a 2 km radius of the project site.

Additional records of non-statutory wildlife sites, and any rare and protected species recorded within a 2 km radius of the project site, were provided by Cumbria Biodiversity Centre (CBDC) in December 2023. Data provided by the CBDC were used to determine the likely presence of protected or notable species and habitats on the project site. Although biological records are rarely comprehensive, they

may provide valuable information on the presence of species not recorded during field surveys. However, since these records are often collected *ad hoc*, an absence of records does not necessarily demonstrate the absence of species.

Aerial photographs and OS maps were consulted to identify waterbodies within 500 m of the survey site, which might provide suitable habitat for amphibians, especially great crested newt (GCN) *Triturus cristatus*. The site was also assigned a GCN risk zone based on data provided by Natural England (NE, 2023).

2.2. HABITAT SURVEY

The habitat survey consisted in mapping the vegetation communities present on site, with the survey area covering the length of Stanah Gill from the point it joins the aqueduct to 50 m upstream of the proposed intake site. The route of the proposed pipeline across to Fisherplace Gill was surveyed, with an approximate 5 m buffer either side.

The habitats immediately surrounding the site features were surveyed and covered an area of approximately 18 ha. The habitat survey was conducted in accordance with standard UKHC habitats definitions, and mapping methodology (UK HCWG 2023). Each habitat type is recorded by way of colour or code, allowing simple display and interpretation on the resulting habitat map (Appendix D). Dominant and indicator plant species were observed and recorded within each habitat type. Additional descriptions of species composition, habitat structure, habitat management, and any features of local ecological interest or potential significance, are provided as supplementary information.

2.3. SPECIES SCOPING SURVEY

The potential for the habitats on the project site to support protected or notable species was assessed in accordance with standard practice and procedures (JNCC 2010, CIEEM 2017a). 'Notable' species are those which are legally protected, are nationally or locally rare, endangered, or are identified as a 'priority' species in the UK or locally. The likelihood of notable species presence within the project site was determined based on the results of the desktop study, visual evidence of animal activity on site, and assessment of the quality and extent of suitable habitats.

To the extent feasible and based upon the surveys completed to date, an impact assessment was conducted to appraise the potential impacts of the proposed works on notable species and supporting habitats. In cases where further surveys are recommended, a more specific impact assessment can be developed once additional surveys have been completed. In addition, any INNS and/or controlled species present on site were recorded.

2.4. SURVEY CONDITIONS AND CONSTRAINTS

Weather conditions at the time of survey were overcast with intermittent mist, low wind (2 Beaufort scale) and an air temperature of ~ 7°C. Conditions prior to and during the survey were not suitable for all target fauna to have been active.

In accordance with Clause 6.7 of BS 42020:2013, any limitations to the survey and ecological assessment are detailed below, and within the results. It should be noted that this species scoping survey does not constitute a full survey for each taxon and cannot categorically ascertain the presence or absence of any species. Where there is potential for protected species of florally rich communities to occur within the survey site, additional survey work may be required to confirm and detail their presence.

Other factors which may limit the accuracy of this PEA:

- Whilst a representation of the habitat types is achievable, some plant species are likely to have been missed due to the timing of survey.

- Although the potential of the habitats to support notable species could be determined to some extent, conditions for surveying were suboptimal, many animals would be inactive and vegetation communities could not be identified in detail.

Where impact could not be confidently ascertained, checks by an ecologist are recommended immediately prior to the start of works.

3. DESKTOP STUDY RESULTS

The following chapter has been produced based upon information gathered from the desk study.

3.1. DESIGNATED SITES

Records show that five statutory sites and five non-statutory sites are located within a 2 km radius of the project site (Table 1; Appendix B). The site lies within the Lake District National Park (LDNP). This designation requires that works must adhere to the LDNP planning authority regulations.

The five statutory sites include three SSSIs: River Derwent and Tributaries, Thirlmere Woods, and Helvellyn & Fairfield. River Derwent and tributaries is primarily designated for the presence of several protected species including Atlantic salmon *Salmo salar*, sea lamprey *Petromyzon marinus*, river lamprey *Lampetra fluviatilis*, brook lamprey *Lampetra planeri*, marsh fritillary butterfly *Euphydryas aurinia*, and several aquatic plant species. Thirlmere Woods is designated for its areas of ancient woodland, noted as one of the best examples of mossy ancient woodland in Cumbria. Helvellyn & Fairfield is designated due to the presence of habitats including acid grassland and upland heath. The SACs are the River Derwent and Bassenthwaite Lake, designated for the presence of Atlantic salmon, sea, river, and brook lamprey, marsh fritillary butterfly, otter *Lutra lutra*, and floating water-plantain *Luronium natans*, and the Lake District High Fells for its habitats including upland tarns, wet and dry heath habitat, and blanket bog.

The non-statutory sites include five Local Wildlife Sites (LWSs). These are St John's Beck Wood, Little How RSV, The Playing Field, Thirlspot Meadow, and Rough How Wood. St John's Beck wood is designated for the presence of a range of important habitats and species including Atlantic salmon and Lamprey. The reason for the designation of the other sites were unavailable at the time of the desk study.

Table 1: Designated sites within 2 km of Fisherplace Hydro.

| <i>Statutory designated sites</i> | | | |
|---------------------------------------|---------------|------------------|---|
| Lake District | National Park | On site | To conserve and enhance the natural beauty, wildlife and cultural heritage of the Lake District and promotes opportunities for the understanding and enjoyment of the area by the public. |
| River Derwent and Tributaries | SSSI | 1.4 km northwest | Designated for the presence of Atlantic salmon, sea, river and brook lamprey, marsh fritillary butterflies, otters, and aquatic plant species. |
| Thirlmere Woods | SSSI | 1.4 km west | Designated for the presence of ancient woodland habitat, particularly of note due to the abundance of mosses, especially the presence of western "Atlantic" species |
| Helvellyn & Fairfield | SSSI | 1.9 km southeast | Designated due to the habitats present including acid grassland and upland heath. |
| River Derwent & Bassenthwaite Lake | SAC | 1.4 km northwest | Designated for the presence of the following Annex II species: Atlantic salmon, sea, river and brook lamprey, marsh fritillary butterflies, otters, and floating water-plantain. |
| Lake District High Fells | SAC | 1.9 km southeast | Designated for the presence of a range of Annex I habitats including upland tarns, wet and dry heath habitat, and blanket bog. |
| <i>Non-statutory designated sites</i> | | | |
| St John's Beck wood | LWS | 1.4 km northwest | Designated for the presence of important habitats and species including Atlantic Salmon and Lamprey. |
| Little How RSV | LWS | 0.9 km northwest | Reasons for designation not provided. |
| The Playing Field | LWS | 0.8 km west | Reasons for designation not provided. |
| Thirlspot Meadow | LWS | 0.9 km west | Reasons for designation not provided. |
| Rough How Wood | LWS | 1.3 km southwest | Reasons for designation not provided. |

3.2. SPECIES RECORDS

The data records provided by CBDC (Appendix C) show that a range of nationally and internationally protected species have historically been recorded within 2 km of the project site. A summary of the most significant results of relevance to the survey area and proposed works is provided below. Distances are taken from a central grid reference. The site lies within a green GCN risk zone risk zone; therefore, GCN are unlikely to be present within the area.

A total of 80 bird species were recorded within the 2 km search, this includes black-headed gull *Chroicocephalus ridibundus*, bullfinch *Pyrrhula pyrrhula*, buzzard *Buteo buteo*, Canada goose *Branta canadensis*, cuckoo *Cuculus canorus*, dipper *Cinclus cinclus*, house sparrow *Passer domesticus*, pied flycatcher *Ficedula hypoleuca*, redstart *Phoenicurus phoenicurus*, and reed bunting *Emberiza schoeniclus*. There were also seven sensitive species recorded.

There were several records of bat species within the search area. These records included common pipistrelle *Pipistrellus pipistrellus*, soprano pipistrelle *P. pygmaeus*, brown long-eared bat *Plecotus auritus*, noctule bat *Nyctalus noctula*, Natterer's bat *Myotis nattereri*, Brandt's bat *Myotis brandti*, and Daubenton's bat *M. daubentonii*. Other terrestrial mammals recorded within the search area included otter *Lutra lutra* 1.6 km NW, badger *Meles meles* 0.6 km NW and SW, red squirrel *Sciurus vulgaris* 0.8 km W, and pine martin *Martes martes*.

There was a single amphibian record of a common frog *Rana temporaria*, and records of common lizard *Zootoca vivipara*. A single bony fish record of an Atlantic salmon *Salmo salar* in St John's beck 1.7 km northwest of site was recorded.

The invasive non-native species grey squirrel *Sciurus carolinensis* was recorded within 0.9 km west of the site.

4. FIELD SURVEY RESULTS

Following the desktop study of the project site, PBA ecologists performed a site visit on 12th December 2023. The following sections provide an assessment of the habitat categories identified within the project site, and any notable species observed or considered to be potentially present.

Habitats present on the project site include upland mixed woodland (w1b), bracken (g1c), upland flushes, fens, and swamps (f2c), blanket bog (f1a), and upland acid grassland (g1b) (Appendix D). A single robin was observed during the survey, and surrogate signs of field vole and rabbits were recorded.

Habitat distribution and location of Target Notes are recorded on the UKHC Map (Appendix D), and photographs are provided in Appendix F.

4.1. RIVERS (PRIORITY HABITAT) (R2A6)

The surveyed reach of Stanah Gill/Sty beck lies within 2.5 km of its marked headwater, so qualifies as a priority habitat for 'Rivers' under the criterion of 'headwaters'. This habitat is proposed of cascade of flowing water and stepped pools with large waterfalls dominated by cobbles, with areas of bedrock, boulders, and gravel. The lower section is shaded by woodland however the upper section is entirely unshaded.

4.2. WOODLAND 1 – UPLAND MIXED ASHWOODS – TEMPERATE RAINFOREST (W1B 25)

The upland ash woodland forms a riparian strip along the downstream section of Stanah Gill a remnant strip of temperate rainforest within the Lake District National Park. The woodland canopy vegetation was dominated by ash *Fraxinus excelsior*, with other lesser species including mature trees of sycamore *Acer pseudoplatanus*, silver birch *Betula pendula*, and oak *Quercus* sp. The understorey vegetation contained species such as bramble *Rubus fruticosus* agg., dogrose *Rosa canina* agg., male fern *Dryopteris filix-mas*, polypody fern *Polypodium vulgare*, rowan *Sorbus aucuparia*, holly *Ilex aquifolium*, and wood sage *Teucrium scorodonia*. Common tamarisk moss *Thuidium tamariscinum* was also dominant on the woodland floor as well as many of species of bryophytes.

4.3. GRASSLAND 1 – BRACKEN (G1C)

The lower slopes surrounding the downstream section of Stanah Gill was predominantly covered in a monoculture of bracken *Pteridium aquilinum*.

4.4. UPLAND HEATHLAND (H1B)

North of Stanah beck, is an area of upland heathland surrounded by bracken. Species recorded included heather *Calluna vulgaris*, mat grass *Nardus stricta*, haircap moss *Polytrichum commune*, and common tamarisk.

4.5. JUNIPER SCRUB (H3K)

North of Stanah beck in between the bracken and upland grassland is an area of juniper scrub dominated by juniper *Juniperus communis*.

4.6. GRASSLAND 2 – UPLAND ACID GRASSLAND (G1B)

The upper section of the area surveyed around Stanah Gill and around the proposed hydro intake was dominated by upland acid grassland. There was a mixture of grass and herbaceous species present. These included mat grass, heather, haircap moss, common tamarisk moss, heath bedstraw *Galium saxatile*, alpine lady's mantle *Alchemilla alpina*, cranberry *Vaccinium* sp., and carnation sedge *Carex panicea*.

4.7. WETLAND 1 – UPLAND FLUSHES, FENS, AND SWAMPS (F2C)

There are two unnamed small headwater streams entering Stanah Gill from the northside. The immediate surrounding area has species characteristic of upland fens. These include various species of bog moss *Sphagnum* spp., common haircap moss, and soft rush *Juncus effusus*.

4.8. WETLAND 2 – BLANKET BOG (F1A)

South of the large area of upland acid grassland, along the proposed route of the pipeline is an area of blanket bog. Species recorded included purple moor grass *Molinia caerulea*, haircap moss, red bog moss *Sphagnum capillifolium*, and deergrass *Trichophorum cespitosum*.

4.9. INLAND ROCK OUTCROP AND SCREE HABITATS (S1A)

Boulder fields and exposed rock of the Lake District Mountain Range. No plant species dominated this habitat.

4.10. BLANKET BOG (F1A), UPLAND ACID GRASSLAND (G1B), AND SCREE (S1A) MOSAIC

The southern half of the proposed pipeline route comprises a mosaic of blanket bog (4.4.) and upland acid grassland (4.3.) with the same characteristic species recorded throughout.

4.11. BRYOPHYTE SURVEY RESULTS

Bryophyte communities were present along Stanah Gill, within the splash zone, on adjacent banks and within the watercourse. Several species were identified onsite throughout the survey and have been included within the relevant habitat descriptions previously. Several samples were taken for identification in the lab, the locations of which are indicated as Target Notes on the UKHC map (Appendix D). The identified species are indicated below. These species are not known to be nationally rare or scarce (Pescott 2016).

Table 2: Bryophyte species (Visit 1)

| Sample number (appendix D) | Botanical name | Location |
|----------------------------|--|-------------|
| 1 | <i>Kindbergia praelonga</i> | Splash zone |
| 2 | <i>Dicranum scoparium</i> | Bankside |
| 3 | <i>Sphagnum capillifolium</i> and <i>Bryum</i> sp. | Bankside |
| 4 | <i>Isothecium myosuroides</i> | Bankside |
| 5 | <i>Calliergonella cuspidata</i> and <i>Racomitrium lanuginosum</i> | Bankside |
| | Tamarisk moss | Woodland |

4.12. STANAH GILL – FISH HABITAT ASSESSMENT

Salmonids are heavily dependent on three main environmental factors for their survival: (1) the right water chemistry within their stream habitat, (2) availability of microhabitats suitable for different stages of their life cycle, (3) and the availability of accessible food (Poff and Huryn 1998, De Crespin De Billy and Usseglio-Polatera 2002). Both Atlantic salmon *Salmo salar* and brown trout *S. trutta* preferentially spawn in the pool-riffle transition zone (De Gaudemar *et al.* 2000, Louhi *et al.* 2008). Water depth and velocity as well as substrate particle size are considered the primary determinants governing the suitability of spawning gravels (Crisp 2000, Armstrong *et al.* 2003). Other important factors include suitable water temperature, high levels of dissolved oxygen, and low levels of fine sediment within the bed substrate (Chapman 1988, Kirstensen and Closs 2008).

Stanah Gill originates from the confluence of several unnamed headwater streams, and its head is approximately 1 km upstream of the proposed hydro intake. Stanah Gill then flows downstream for approximately 300 m to a confluence with two unnamed inputs. It then becomes Sty beck which flows for a further 650 m. Sty beck enters an existing aqueduct that runs parallel with the east shore of Thirlmere. The surveyed reach extends for approximately 1 km and contains a range of waterfalls and associated plunge pools, and sections of riffle. The wetted channel width is varied throughout the site, ranging from 1-3 m, with water depth ranging from 5-20 cm through riffles and runs to >1 m in plunge pools. On average the water depth was recorded as 20 cm across the site. Bed material across the entire site was dominated by boulder, however there were two notable areas of suitable spawning gravel.

The surveyed reach includes ten waterfalls along its length. The first notable waterfall, named Stybeck Waterfall, sits at the downstream end of the reach and consists of a series of large falls. Throughout the riparian woodland section of the beck is a series of waterfalls all ranging 6 – 7 m in height. The largest waterfall on the reach is further upstream, approximately 300 m below the proposed intake with a height of approximately 10 m. Just below the intake is a series of 7 m high falls. Given the size of the drops and depth of the plunge pools associated with each of these waterfalls, they are likely substantial enough to block the routes of all migratory fish species.

Two areas of the reach were considered to have suitable gravel for salmonid spawning. These areas were located approximately 130 and 170 m downstream of the proposed intake. Both were found to be in good condition but are considered inaccessible to salmonids due to the a forementioned waterfalls downstream. It is unlikely that Stanah Gill/Sty beck will be used by salmonid species; however, the habitat is suitable for a range of resident fish species although none were recorded during the survey.

Table 3: Summary of desktop study and field survey results.

| Taxa | Recorded in desk study <i>(Full records in Appendix C)</i> | Evidence on site <i>(Locations and photos in Appendices D & F)</i> | Potential of site to support presence |
|----------------------|--|---|--|
| Birds | Yes – A large and diverse number of bird species including several nationally and internationally important species. | Yes – A robin was recorded during the site survey. | High – Many bird species have been recorded within 2 km of the site. The habitats present on site have the potential to provide nesting and foraging opportunity for a range of species. |
| Bats | Yes – A range of bat species recorded, including common and soprano pipistrelles, whiskered, noctule, Daubenton’s, and Brandt’s bat. A number of these were recorded along the length of Stanah Gill. | No – No bats were recorded during the site survey. | Moderate – The riparian woodland likely provides roosting opportunities for a range of bat species. The rest of the site may support foraging bats. |
| Otter | Yes – Several records of otter as recently as 2017. The nearest record is 1.6 km away to the north in St John’s beck. | No – No otter were recorded during the site survey. | Low – There is low potential for otters to be transient visitors to the site, foraging and commuting. |
| Badger | Yes – Several records of badger within 2 km, most recently in 2014. The nearest record is 0.6 km from the central grid reference. | No – No badger were recorded during the site survey. | Moderate – There is potential for badger to be transient visitors to the site foraging in areas of woodland and grassland. |
| Other Mammals | Yes – Other terrestrial mammals recorded included red squirrel, water shrew, rabbit, pine martin, hedgehog, roe deer, and red deer. | Yes – No other mammals were recorded during the site survey. However surrogate signs of rabbit and field vole were recorded. | High – Small mammals are likely to take refuge and forage across the site. |
| Amphibians | Yes – Record of common frog 1.6 km from site. The project area is within a green zone for GCN. | No – No amphibians were recorded during the site survey. | Moderate – Watercourse has the potential to support common amphibians. Unlikely to support GCN due to being in a GCN green zone. |
| Reptiles | Yes – Record of common lizard 1.8 km from site. | No – No reptiles were recorded during the site survey. | Moderate – No reptiles were recorded during the survey however habitat is suitable. |
| Fish | Yes – Record of Atlantic salmon 1.7 km from site in St John’s Beck. There is connectivity between St John’s beck and Stanah Gill through How beck. | No – No migratory or resident fish species were recorded during the site survey. | High – Sty beck/Stanah Gill considered impassable to salmonids. Other resident species are likely to be present. |

| Taxa | Recorded in desk study <i>(Full records in Appendix C)</i> | Evidence on site <i>(Locations and photos in Appendices D & F)</i> | Potential of site to support presence |
|------------------------------------|--|---|---|
| Plants | Yes – Three flowering plants were recorded within the 2 km search area. | Yes – A wide range of plant and bryophyte species were recorded during the survey. | Moderate – No protected plants were recorded during the desk study or during the survey. |
| Invasive Non-Native Species | Yes – Records of grey squirrel within the 2 km search area of the central grid reference. | No – No invasive species were recorded during the site survey. | Low – No INNS recorded on site. There is potential for grey squirrel, recorded in the desk study, to use the riparian woodland |

5. VISIT 2

In April 2024 the proposed location of the intake was moved approximately 400 m upstream and adjusted the proposed pipeline as a result (Appendix E). PBA Applied Ecology were asked to survey the additional area and amend the PEA report. The approach followed that set out in section 2, with the field survey being conducted on the 23rd April 2024 by Andrew Macaulay BSc ACIEEM and Rhys Colenutt BSc.

Habitats present on within the survey area include upland flushes, fens, and swamps (f2c), blanket bog (f1a), and upland acid grassland (g1b) (Appendix D). A single wren was observed during the survey. Habitat distribution and location of Target Notes are recorded on the UKHC Map (Appendix D), and photographs are provided in Appendix F.

5.1. WETLAND 3 – UPLAND FLUSHES, FENS, AND SWAMPS (F2C)

An area of upland fens was identified approximately 50 m below the proposed intake on the north bank. Characteristic species present included bog moss and soft rush.

There is another area of upland fens associated with an unnamed stream entering Stanah gill above the proposed intake.

5.2. WETLAND 4 – BLANKET BOG (F1A)

Following the route of the new proposed pipeline (Version A) there is an area of blanket bog approximately 60 m along the route. The dominant species present is sphagnum spp. Other species include cotton grass *Eriophorum* spp., and deer grass.

5.3. GRASSLAND 3 – UPLAND ACID GRASSLAND (G1B)

The majority of the extended survey area along Stanah gill was upland acid grassland. There were two large areas of upland acid grassland along the new proposed pipeline (Version A). Species present included sphagnum spp., soft rush, hairy sedge *Carex hirta*, sorrel *Rumex acetosa*, common haircap moss *Polytrichum commune*, marsh thistle *Cirsium palustre*, opposite-leaved golden saxifrage *Chrysosplenium oppositifolium*, and bilberry *Vaccinium myrtillus*.

5.4. BLANKET BOG (F1A) AND UPLAND ACID GRASSLAND MOSAIC (G1B)

For two large stretches of the new proposed pipeline (Version A) there was a mosaic of both blanket bog and upland acid grassland habitat.

5.5. BRYOPHYTE SURVEY RESULTS

A further two bryophyte samples were taken for identification in the lab, the locations of which are indicated as Target Notes (TN10 and TN11) on the UKHC map (Appendix D). The identified species are indicated below. These species are not known to be nationally rare or scarce (Pescott 2016).

Table 4: Bryophyte species (Visit 2)

| Sample number (appendix D) | Botanical name | Location | TN# |
|----------------------------|---|------------------------|-----|
| 6 | <i>Bryum capillare</i> , <i>Ctenidium molluscum</i> , <i>Calliergonella cuspidate</i> , <i>Philonotis fontana</i> , and <i>Chiloscyphus sp.</i> | Splash zone & Bankside | 10 |
| 7 | <i>Bryum capillare</i> , <i>Rhynchostegium murale</i> , <i>Riccia glauca</i> , and <i>Jugermannia sp.</i> | Splash zone & Bankside | 11 |

5.6. FISH HABITAT ASSESSMENT

The extended survey area included a reach of approximately 400 m. The composition of the watercourse was similar to the reach previously surveyed, containing a range of waterfalls and their associated plunge pools, and sections of riffle. The wetted channel width varied along the reach, ranging from approximately 0.5 - 3 m, with water depth ranging from 5-20 cm through riffles and runs to >1 m in plunge pools. On average the water depth was recorded as 20 cm across the site. Bed material across the entire site was dominated by boulder and cobble, however there were two notable areas of suitable spawning gravel (Appendix F and G).

These areas were located approximately 80 and 170 m downstream of the proposed intake. Both were found to be in good condition but are considered inaccessible to salmonids due to waterfall forming blockers downstream. It is unlikely that Stanah Gill/Sty beck will be used by salmonid species; however, the habitat is suitable for a range of resident fish species although none were recorded during the 2nd visit.

6. EVALUATION AND RECOMMENDATIONS

The proposed project is located within the Lake District National Park and within 2 km of River Derwent and tributaries, Thirlmere Woods, and Helvellyn & Fairfield SSSIs, and River Derwent & Bassenthwaite Lake and Lake District High Fells SAC. There are also five non-statutory designated sites within 2 km of site. Important habitats present within and surrounding the survey site include priority river habitat, upland heathland, upland flushes, fens and swamps, and blanket bog. There is potential for other protected and notable species to use habitats on site. In addition, it is likely that transient mammals and birds will use the habitats on site. Significant ecological features of interest are marked on the UK Habitat Classifications Map in Appendix D, and photographs provided in Appendix F.

Table 3 (below) provides an evaluation of the ecological features found on the survey site, and the potential impact of the proposed works to each of these features in the absence of any mitigation. Recommendations are made to avert the potential risk of both short- and long-term adverse impacts on local biodiversity, and to avoid contravention of environmental and wildlife law. Implementation of appropriate environmental control procedures will be essential to protect the river habitats and species.

The site is within the Lake District National Park, all works must therefore comply with LDNP authority planning regulations.

Designated sites are unlikely to be impacted due to the distance from the site and scale of the works.

Table 5: *Ecological features – Evaluation and recommendations.*

| Ecological Feature | Potential impact of proposed development | Recommendations for mitigation and/or further surveys |
|---|---|--|
| Lake District National Park | Moderate – The proposed works will reduce the flow within Sty beck/Stanah Gill, and therefore may affect the surrounding vegetation and downstream habitats. | All works must therefore comply with LDNPA planning regulations. |
| Priority river habitat (headwater) | High – Pollution/run-off entering watercourse. Introduction of invasive species or disease. | Pollution prevention and sediment control to be detailed within a Surface Water Management Plan, incorporated into method of works, and fully implemented. Biosecurity procedures to be detailed within a Biosecurity and INNS Plan and method of works. BNG became mandatory as of January 2024, however the development may be exempt as less than 5 m of linear river habitat will be impacted. The local planning authority should determine whether the project requires BNG. |
| Upland ash woodland, blanket bog, heathland, and upland acid grassland | Moderate – Will be disturbed due to pipeline works. The upland ash woodland may lose some of the temperate rainforest characteristics through dewatering. | Ideally sensitive habitats will be avoided, or disturbance to them will be minimised as much as possible. An Ecological Impact Assessment may be required to determine if the woodland will be impacted by the development. |

| Ecological Feature | Potential impact of proposed development | Recommendations for mitigation and/or further surveys |
|---|---|---|
| Aquatic Species | High – Fish present in the water course may be impacted by in river works. | <p>A fish eDNA survey should be completed in the headwaters that will be dewatered to determine if it is used by resident fish populations.</p> <p>Work should be completed within the in-river working season (15th June – 30th September).</p> <p>A precautionary fish rescue should be undertaken prior to any in-river works.</p> <p>Appropriate pollution prevention measure will be required such as silt curtains and or sediment fencing.</p> |
| Birds | High – suitable nesting bird habitat present on site. | Vegetation clearance works should be timed to avoid the nesting bird season which runs from March to August inclusive. |
| Reptiles | High – If reptiles are present within any of the habitats on site. | Any long vegetation will require a two-stage vegetation clearance. The grass should be strimmed down to 10 cm. A hand search for reptiles should be completed by an ecologist and following this the vegetation should be cut as low as possible. |
| INNS | Low – No evidence of Invasive species present in the survey area. | Strict biosecurity measures should be adhered to including the washing of all equipment (boots, machinery etc) on arrival to, and removal from, site. |
| <p>- Ecologist to give a toolbox talk at the start of works to ensure all site personnel are aware of the potential presence of protected species, designated sites, and their legal obligations to protect the environment.</p> <p>- Any excavations created during the works should be left covered overnight or fitted with a ramp to allow any entrapped animals to escape.</p> | | |

7. CONCLUSION

If the recommendations detailed above (Chapter 5 and Table 3), are followed, and good working practices are implemented, no ecological features are expected to be adversely impacted by the proposed development/works (Appendix E).

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APPENDICES

Appendix A – Policy and Legislation

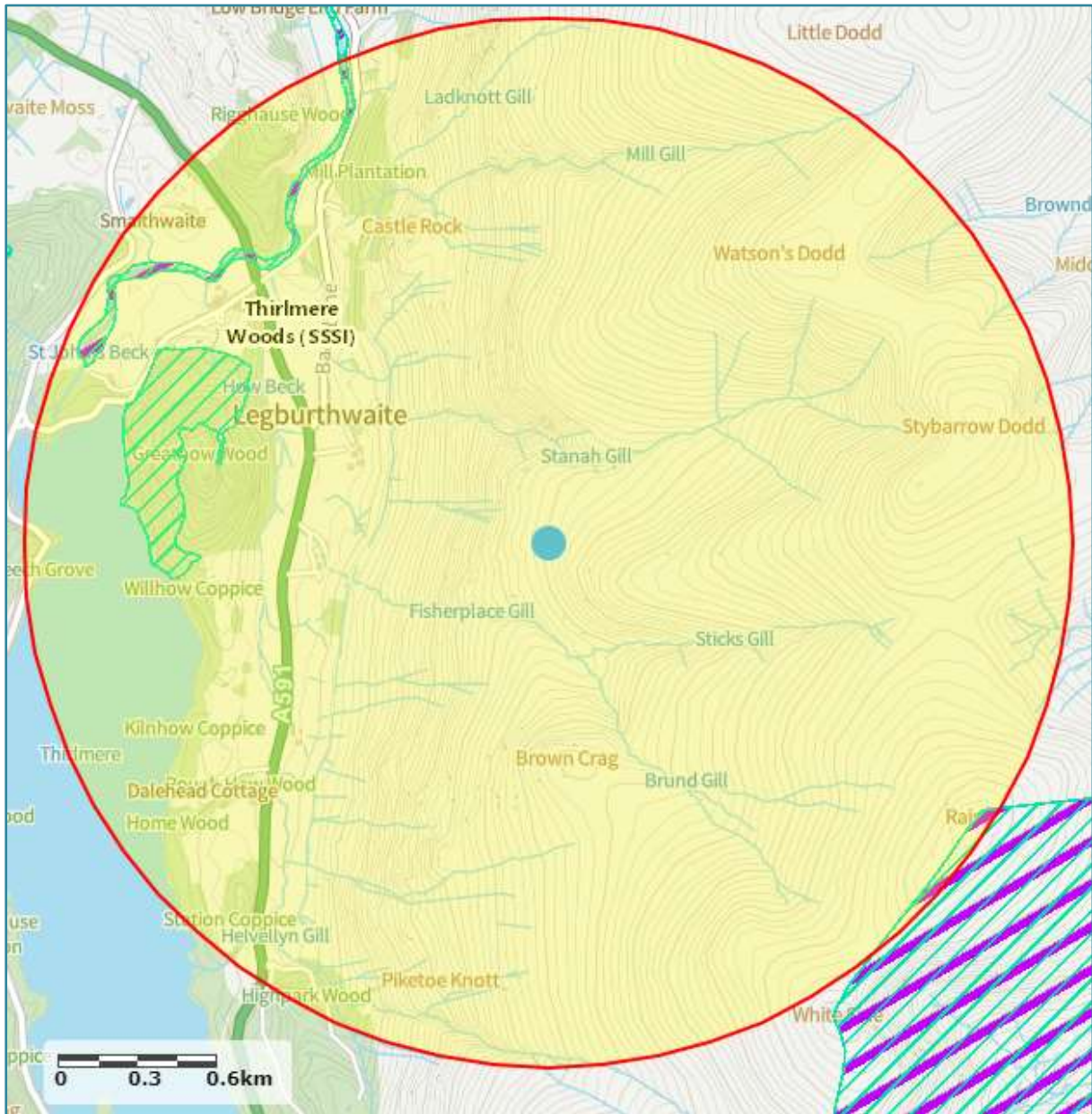
Several statutory measures are in place to protect habitats and wildlife. These measures range from a global to local scale, and variously give protection to whole ecosystems or single species. Included below is a summary of the legislation and planning policy most applicable to the current project/works. Please note that this is not an exhaustive list, and the original texts should be consulted for further details.

| Legislation | | Description |
|----------------------|---|--|
| INTERNATIONAL | Convention on the Conservation of European Wildlife and Natural Habitats 1979 (Bern Convention) | Parties are required to protect all wild plant and animal species and their natural habitats, and to afford special protection to the most vulnerable or threatened species. |
| | Convention on Biological Diversity 1992 | Parties are required to develop national strategies, plans, or programmes, for the conservation and sustainable use of biological diversity. In the UK, this is implemented through the UK Post-2010 Biodiversity Framework. |
| | Habitats Directive 1992/43/EEC | European member states are required to implement legislation to designate a network of protected sites and maintain their ecological integrity. Certain species are also strictly protected through this Directive. In England, this is implemented through the Conservation of Habitats & Species Regulations 2010. |
| | Water Framework Directive 2000/60/EC | European member states must implement legislation to designate, monitor, and maintain or improve, the ecological status of river basins and coastal waters. In England, this is implemented through the Water Environment Regulations 2003. |
| | Birds Directive 2009/147/EC | European member states are required to provide general protection to all wild birds, and to designate protected sites for rare or vulnerable species. In the UK, this is implemented through the Wildlife and Countryside Act 1981. |
| NATIONAL | National Parks and Access to the Countryside Act 1949 (as amended) | Provides the protection of National Parks and is still the primary legislation under which some local sites for nature conservation are designated. |
| | Wildlife and Countryside Act 1981 (as amended) | Provides for the protection of sites and species of national importance for nature conservation. The level of protection depends on which Schedule of the Act the species is listed on. Species protection includes prohibition of some or all of: killing, injuring, disturbing, or taking individuals, as well as the protection of breeding and sheltering places. Schedule 9 (with 2010 amendments), lists invasive non-native species, for which it is an offence to not adequately control or cause to grow in the wild. |

| Legislation | | Description |
|-----------------|---|---|
| | Countryside and Rights of Way Act 2000 | Amends and strengthens existing legislation for protection of threatened species and SSSIs. For example, some offences under the Wildlife and Countryside Act can now result in imprisonment. |
| NATIONAL | Natural Environment and Rural Communities Act 2006 | Places a duty on all public authorities to consider biodiversity in their work. The duty extends beyond just conserving what is already there, to carrying out, supporting, and requiring actions that may restore or enhance biodiversity. Requires the Secretary of State to produce a list of species and habitats of principal importance for the conservation of biodiversity. This list is used to guide authorities when implementing their duty. |
| | The Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019 | An amendment to the Conservation of Habitats and Species Regulations 2017, to transpose these EU regulations to UK law post-Brexit. Provides for the protection of sites in the UK that support habitats and species in need of conservation across Europe (SPAs/SACs). Provides full protection to species of European importance. The Regulations also set out how licensing for European protected species should work and makes breaching the conditions of a licence an offence. |
| | Environmental Sanctions Regulations 2010 | Under these Regulations, Natural England and the Environment Agency are able to halt illegal activities, to order the restoration of environmental damage, and to impose fines (up to £250,000), where legislation has been breached. |
| | National Planning Policy Framework 2012 | States that the planning system should help minimise the impacts that development can have on biodiversity and provide net gains in biodiversity where possible. |
| | Hedgerows Regulations 1997 | Allows for the identification of important hedgerows, and their protection under the Regulations. Permission to remove important hedgerows must be obtained from the local planning authority. |
| | Infrastructure Act 2015 | Contains amendments to the Wildlife and Countryside Act, in relation to non-native invasive species. Enables an environmental authority to issue a species control order, requiring a landowner to undertake control measures, or allowing the authority to do so at the landowner's expense. |
| | Protection of Badgers Act 1992 | Provides for strict protection of badgers and their setts. Offences under the act include killing, injuring, or disturbing a badger, as well as damaging or interfering with a sett, unless a licence is obtained beforehand. |

| Legislation | Description |
|--|--|
| Environmental Protection Act 1990 | This Act makes provision for the improved control of pollution to the air, water, and land, by regulating the management of waste and the control of emissions. Key provisions of the Act impose a duty of care on any business or person who produces, carries, keeps, treats, disposes of, or imports any controlled waste, to do so safely. |
| Salmon and Freshwater Fisheries Act 1975 | Legislation to protect freshwater fish, with a particular focus on salmonids. Activities that constitute an offence include direct mortality of fish, creating barriers to migration, and causing degradation of habitats. It is also an offence to discharge toxic substances into waters containing fish or their spawn. |

Appendix B – Designated Sites



Statutory designated sites within 2 km of works site (MAGIC, 2023).



Non-statutory designated sites within 2 km of works site.

Appendix C – Species Records

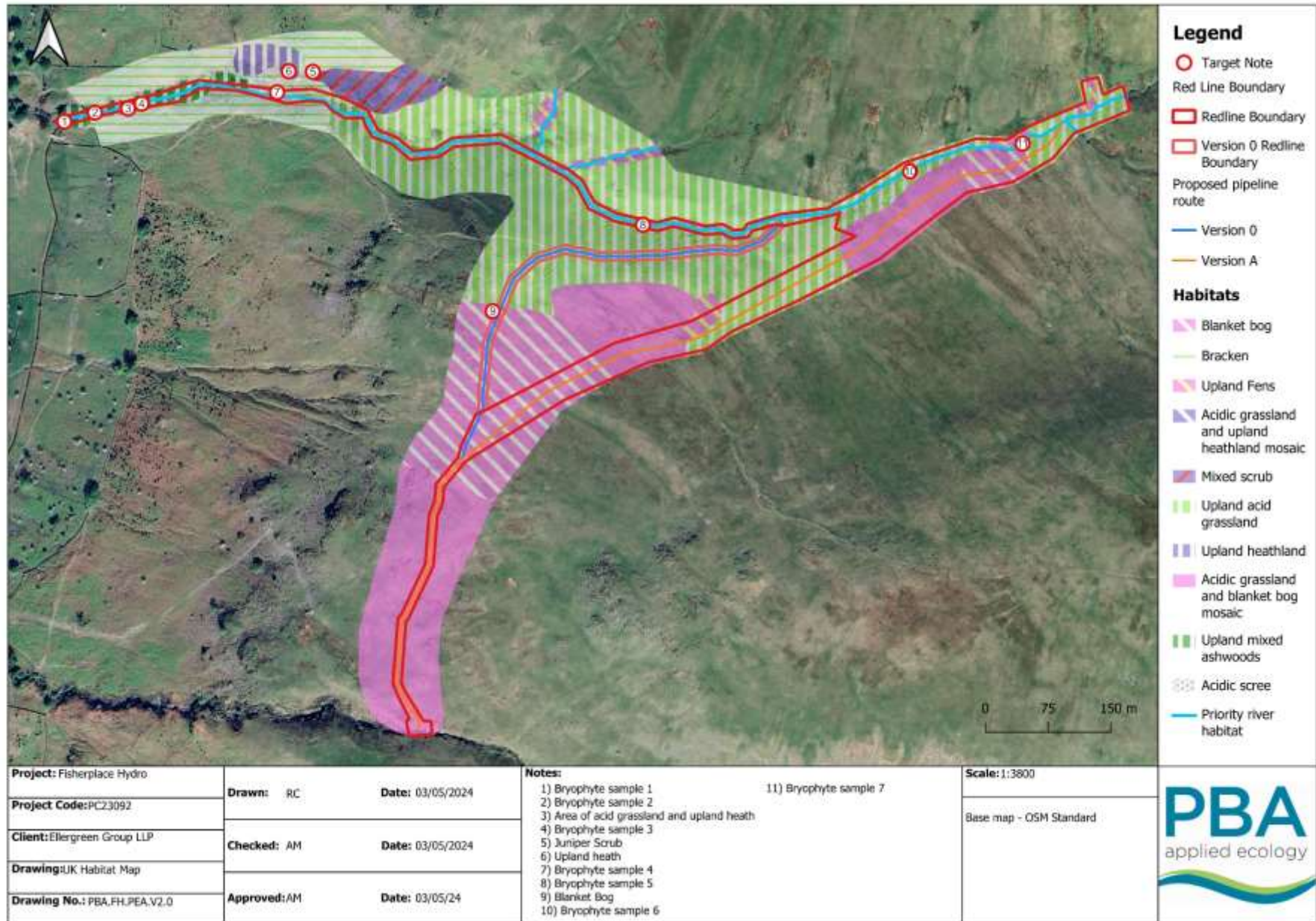
| Scientific binomial | Common name | Taxon | Year | Distance from site (km) |
|-----------------------------------|--------------------------|-----------|------|-------------------------|
| <i>Rana temporaria</i> | Common Frog | amphibian | 2013 | 1.6 |
| <i>Acanthis flammea</i> | Common Redpoll | bird | 1997 | 1.8 |
| <i>Accipiter nisus</i> | Sparrowhawk | bird | 2012 | 1.0 |
| <i>Actitis hypoleucos</i> | Common Sandpiper | bird | 2011 | 1.8 |
| <i>Alauda arvensis</i> | Skylark | bird | 2011 | 0.6 |
| <i>Anas platyrhynchos</i> | Mallard | bird | 2012 | 1.8 |
| <i>Anser anser</i> | Greylag Goose | bird | 2013 | 1.8 |
| <i>Anthus pratensis</i> | Meadow Pipit | bird | 2012 | 0.6 |
| <i>Anthus trivialis</i> | Tree Pipit | bird | 2011 | 0.6 |
| <i>Apus apus</i> | Swift | bird | 2008 | 2.4 |
| <i>Ardea cinerea</i> | Grey Heron | bird | 2012 | 1.8 |
| <i>Aythya fuligula</i> | Tufted Duck | bird | 2008 | 1.8 |
| <i>Branta canadensis</i> | Canada Goose | bird | 2013 | 1.8 |
| <i>Buteo buteo</i> | Buzzard | bird | 2012 | 0.6 |
| <i>Carduelis carduelis</i> | Goldfinch | bird | 2012 | 1.8 |
| <i>Certhia familiaris</i> | Treecreeper | bird | 2012 | 1.8 |
| <i>Chloris chloris</i> | Greenfinch | bird | 2012 | 1.8 |
| <i>Chroicocephalus ridibundus</i> | Black-headed Gull | bird | 2010 | 2.2 |
| <i>Cinclus cinclus</i> | Dipper | bird | 2012 | 1.5 |
| <i>Coloeus monedula</i> | Jackdaw | bird | 2012 | 0.6 |
| <i>Columba oenas</i> | Stock Dove | bird | 1998 | 2.6 |
| <i>Columba palumbus</i> | Woodpigeon | bird | 2012 | 1.8 |
| <i>Corvus corone</i> | Carrion Crow | bird | 2012 | 0.6 |
| <i>Corvus frugilegus</i> | Rook | bird | 2011 | 0.6 |
| <i>Cuculus canorus</i> | Cuckoo | bird | 2012 | 1.8 |
| <i>Cyanistes caeruleus</i> | Blue Tit | bird | 2012 | 1.5 |
| <i>Cygnus cygnus</i> | Whooper Swan | bird | 2010 | 2.2 |
| <i>Delichon urbicum</i> | House Martin | bird | 2012 | 1.8 |
| <i>Dendrocopos major</i> | Great Spotted Woodpecker | bird | 2012 | 1.8 |
| <i>Emberiza citrinella</i> | Yellowhammer | bird | 2000 | 0.6 |
| <i>Emberiza schoeniclus</i> | Reed Bunting | bird | 2007 | 1.8 |
| <i>Erithacus rubecula</i> | Robin | bird | 2012 | 0.6 |
| <i>Falco tinnunculus</i> | Kestrel | bird | 2011 | 0.6 |
| <i>Ficedula hypoleuca</i> | Pied Flycatcher | bird | 2010 | 1.8 |
| <i>Gallinago gallinago</i> | Snipe | bird | 2008 | 1.5 |
| <i>Garrulus glandarius</i> | Jay | bird | 2012 | 1.8 |
| <i>Hirundo rustica</i> | Swallow | bird | 2012 | 1.8 |
| <i>Lagopus lagopus</i> | Red Grouse | bird | 2009 | 1.5 |
| <i>Larus argentatus</i> | Herring Gull | bird | 2012 | 1.5 |
| <i>Larus fuscus</i> | Lesser Black-backed Gull | bird | 2012 | 1.5 |
| <i>Loxia curvirostra</i> | Crossbill | bird | 2010 | 1.8 |

| | | | | |
|-------------------------------------|-------------------------------------|------|------|-----|
| <i>Mergus merganser</i> | Goosander | bird | 2011 | 1.6 |
| <i>Mergus serrator</i> | Red-breasted Merganser | bird | 2013 | 1.8 |
| <i>Motacilla alba</i> | Pied Wagtail | bird | 2012 | 0.6 |
| <i>Motacilla cinerea</i> | Grey Wagtail | bird | 2012 | 0.6 |
| <i>Muscicapa striata</i> | Spotted Flycatcher | bird | 2012 | 1.5 |
| <i>Oenanthe oenanthe</i> | Wheatear | bird | 2012 | 0.6 |
| <i>Parus major</i> | Great Tit | bird | 2012 | 0.6 |
| <i>Passer domesticus</i> | House Sparrow | bird | 2012 | 1.8 |
| <i>Periparus ater</i> | Coal Tit | bird | 2012 | 0.6 |
| <i>Phalacrocorax carbo</i> | Cormorant | bird | 2007 | 2.2 |
| <i>Phasianus colchicus</i> | Pheasant | bird | 2008 | 1.8 |
| <i>Phoenicurus phoenicurus</i> | Redstart | bird | 2012 | 1.5 |
| <i>Phylloscopus sibilatrix</i> | Wood Warbler | bird | 2010 | 1.8 |
| <i>Phylloscopus trochilus</i> | Willow Warbler | bird | 2012 | 0.6 |
| <i>Pica pica</i> | Magpie | bird | 2012 | 1.5 |
| <i>Picus viridis</i> | Green Woodpecker | bird | 2012 | 1.8 |
| <i>Plectrophenax nivalis</i> | Snow Bunting | bird | 2010 | 1.5 |
| <i>Poecile montanus</i> | Willow Tit | bird | 1998 | 2.6 |
| <i>Prunella modularis</i> | Dunnock | bird | 2012 | 1.8 |
| <i>Pyrrhula pyrrhula</i> | Bullfinch | bird | 2012 | 1.8 |
| <i>Regulus regulus</i> | Goldcrest | bird | 2012 | 1.5 |
| <i>Saxicola rubicola</i> | Stonechat | bird | 2008 | 1.8 |
| <i>Scolopax rusticola</i> | Woodcock | bird | 2011 | 1.8 |
| sensitive_species_f | sensitive_species_f | bird | 2008 | 6.9 |
| sensitive_species_h | sensitive_species_h | bird | 2006 | 6.9 |
| sensitive_species_l | sensitive_species_l | bird | 2000 | 2.6 |
| sensitive_species_n | sensitive_species_n | bird | 2011 | 1.8 |
| sensitive_species_o | sensitive_species_o | bird | 2010 | 1.5 |
| sensitive_species_t | sensitive_species_t | bird | 2000 | 1.6 |
| sensitive_species_w | sensitive_species_w | bird | 2010 | 0.6 |
| <i>Sitta europaea</i> | Nuthatch | bird | 2012 | 0.6 |
| <i>Spinus spinus</i> | Siskin | bird | 2012 | 1.7 |
| <i>Strix aluco</i> | Tawny Owl | bird | 2011 | 1.8 |
| <i>Sturnus vulgaris</i> | Starling | bird | 2012 | 2.2 |
| <i>Troglodytes troglodytes</i> | Wren | bird | 2012 | 0.6 |
| <i>Turdus iliacus</i> | Redwing | bird | 2011 | 1.5 |
| <i>Turdus merula</i> | Blackbird | bird | 2012 | 0.6 |
| <i>Turdus philomelos</i> | Song Thrush | bird | 2012 | 1.5 |
| <i>Turdus torquatus</i> | Ring Ouzel | bird | 2012 | 0.6 |
| <i>Turdus viscivorus</i> | Mistle Thrush | bird | 2012 | 1.0 |

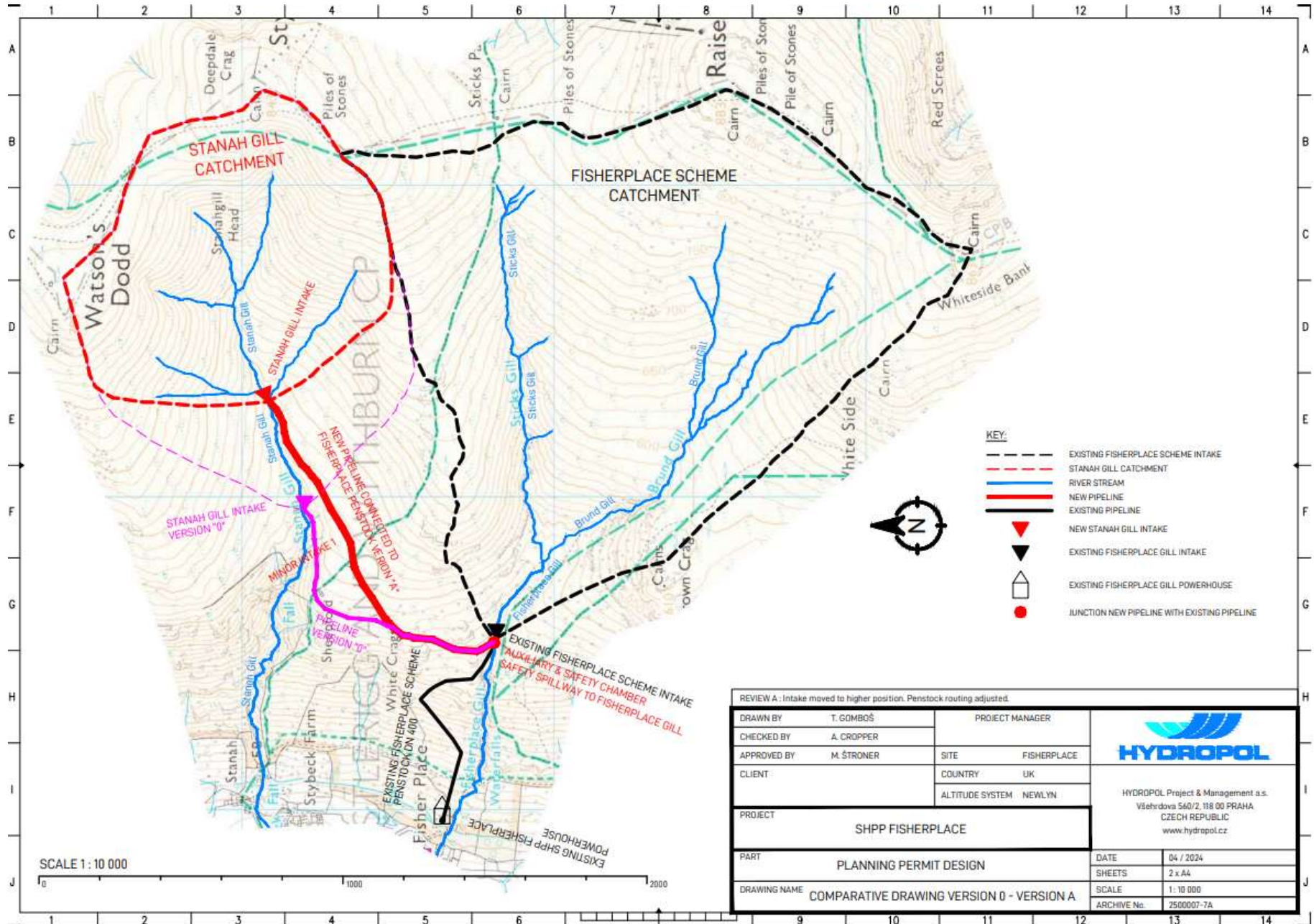
| | | | | |
|---|---|------------------------------------|------|-----|
| <i>Salmo salar</i> | Atlantic Salmon | bony fish (Actinopterygii) | 1996 | 1.7 |
| <i>Juniperus communis</i> <i>subsp. communis</i> | Common Juniper | conifer | 2012 | 0.2 |
| <i>Dryas octopetala</i> | Mountain Avens | flowering plant | 2010 | 2.7 |
| <i>Euphrasia officinalis</i> <i>subsp. monticola</i> | <i>Euphrasia officinalis</i> subsp. <i>monticola</i> | flowering plant | 1995 | 1.2 |
| <i>Sorbus rupicola</i> | Rock Whitebeam | flowering plant | 1987 | 1.4 |
| <i>Bagous glabrirostris</i> | <i>Bagous glabrirostris</i> | insect - beetle (Coleoptera) | 2007 | 2.4 |
| <i>Placusa depressa</i> | <i>Placusa depressa</i> | insect - beetle (Coleoptera) | 2008 | 2.2 |
| <i>Boloria selene</i> | Small Pearl-bordered Fritillary | insect - butterfly | 2009 | 1.8 |
| <i>Coenonympha</i> <i>pamphilus</i> | Small Heath | insect - butterfly | 2019 | 1.9 |
| <i>Erebia epiphron</i> | Mountain Ringlet | insect - butterfly | 2013 | 2.1 |
| <i>Polygonia c-album</i> | Comma | insect - butterfly | 2001 | 1.1 |
| <i>Cordulegaster</i> <i>boltonii</i> | Golden-ringed Dragonfly | insect - dragonfly (Odonata) | 2015 | 0.8 |
| <i>Apamea remissa</i> | Dusky Brocade | insect - moth | 2012 | 1.9 |
| <i>Ceramica pisi</i> | Broom Moth | insect - moth | 2014 | 1.9 |
| <i>Drymonia</i> <i>dodonaea</i> | Marbled Brown | insect - moth | 2017 | 1.9 |
| <i>Ecliptopera</i> <i>silaceata</i> | Small Phoenix | insect - moth | 2017 | 1.9 |
| <i>Mniotype adusta</i> | Dark Brocade | insect - moth | 2012 | 1.9 |
| <i>Spilosoma</i> <i>lubricipeda</i> | White Ermine | insect - moth | 2017 | 1.9 |
| <i>Spilosoma lutea</i> | Buff Ermine | insect - moth | 2011 | 1.9 |
| <i>Tyria jacobaeae</i> | Cinnabar | insect - moth | 2009 | 1.8 |
| <i>Dicranota exclusiva</i> | <i>Dicranota exclusiva</i> | insect - true fly (Diptera) | 2005 | 1.8 |
| <i>Dicranota simulans</i> | <i>Dicranota simulans</i> | insect - true fly (Diptera) | 2007 | 1.8 |
| <i>Tasiocera</i> <i>fuscescens</i> | <i>Tasiocera fuscescens</i> | insect - true fly (Diptera) | 2004 | 2.1 |
| <i>Tipula gimmerthali</i> | <i>Tipula gimmerthali</i> | insect - true fly (Diptera) | 2009 | 2.1 |
| <i>Cladonia coccifera</i> <i>s. lat.</i> | Scarlet-Cup Lichen | lichen | 1992 | 1.9 |
| <i>Peltigera</i> <i>leucophlebia</i> | <i>Peltigera leucophlebia</i> | lichen | 2011 | 0.4 |
| <i>Scapania paludosa</i> | Floppy Earwort | liverwort | 2008 | 2.1 |
| <i>Zootoca vivipara</i> | Common Lizard | reptile | 2008 | 1.8 |

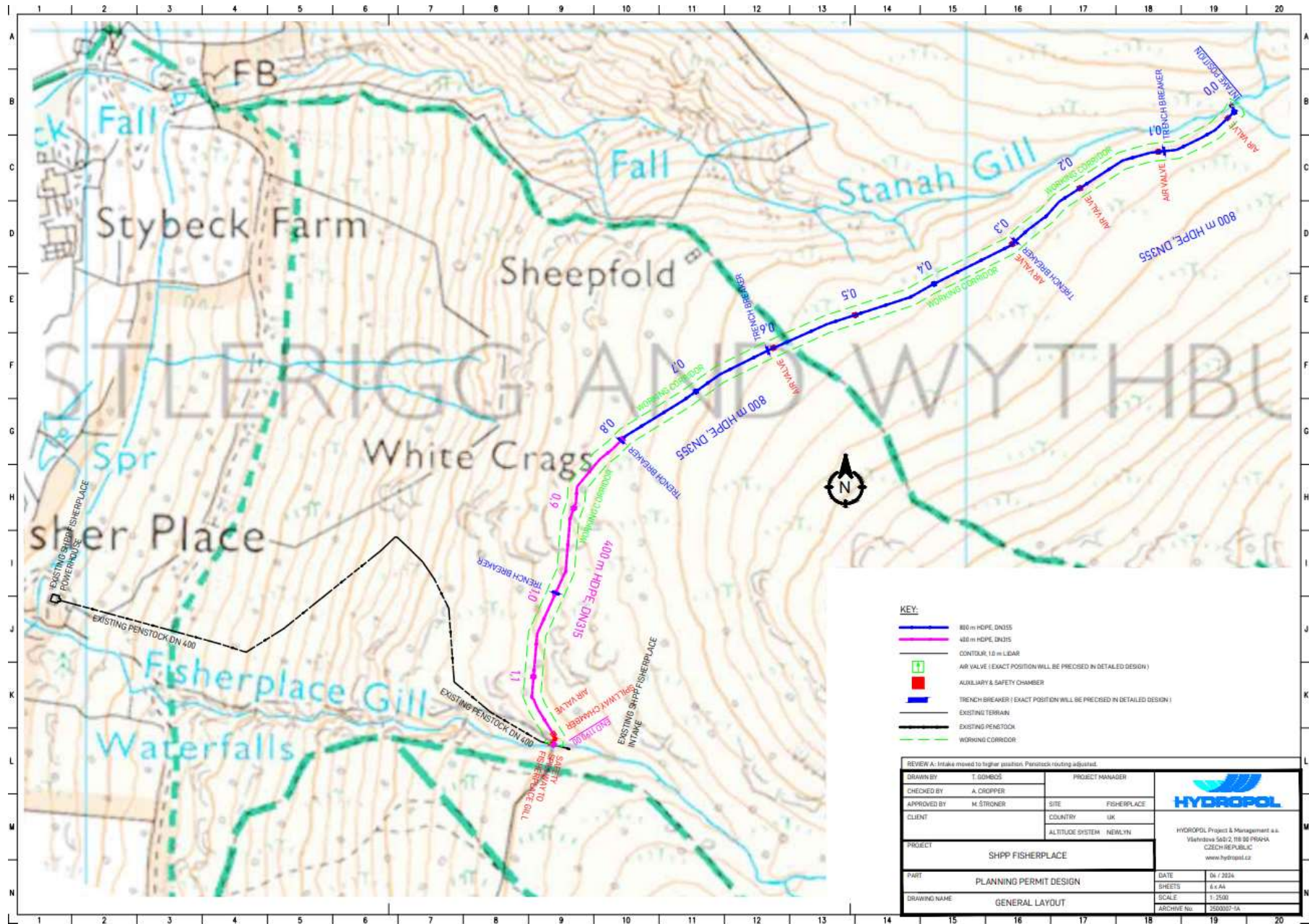
| | | | | |
|----------------------------------|------------------------|--------------------|------|-----|
| <i>Capreolus capreolus</i> | Roe Deer | terrestrial mammal | 2013 | 1.2 |
| <i>Cervus elaphus</i> | Red Deer | terrestrial mammal | 1995 | 1.2 |
| <i>Erinaceus europaeus</i> | West European Hedgehog | terrestrial mammal | 2019 | 1.0 |
| <i>Lutra lutra</i> | Eurasian Otter | terrestrial mammal | 2017 | 1.6 |
| <i>Martes martes</i> | Pine Marten | terrestrial mammal | 1982 | 1.5 |
| <i>Meles meles</i> | Eurasian Badger | terrestrial mammal | 2014 | 0.6 |
| <i>Myotis</i> | Myotis Bat species | terrestrial mammal | 2016 | 0.4 |
| <i>Myotis brandtii</i> | Brandt's Bat | terrestrial mammal | 2016 | 1.1 |
| <i>Myotis daubentonii</i> | Daubenton's Bat | terrestrial mammal | 2016 | 1.1 |
| <i>Myotis nattereri</i> | Natterer's Bat | terrestrial mammal | 2016 | 1.1 |
| <i>Neomys fodiens</i> | Eurasian Water Shrew | terrestrial mammal | 2009 | 1.8 |
| <i>Nyctalus noctula</i> | Noctule Bat | terrestrial mammal | 2016 | 0.4 |
| <i>Oryctolagus cuniculus</i> | European Rabbit | terrestrial mammal | 2016 | 1.1 |
| <i>Pipistrellus pipistrellus</i> | Common Pipistrelle | terrestrial mammal | 2016 | 0.4 |
| <i>Pipistrellus pygmaeus</i> | Soprano Pipistrelle | terrestrial mammal | 2016 | 0.4 |
| <i>Plecotus auritus</i> | Brown Long-eared Bat | terrestrial mammal | 2016 | 0.4 |
| <i>Sciurus carolinensis</i> | Eastern Grey Squirrel | terrestrial mammal | 2016 | 0.9 |
| <i>Sciurus vulgaris</i> | Eurasian Red Squirrel | terrestrial mammal | 2015 | 0.8 |

Appendix D – UK Habitat Classifications Map









Appendix E – Proposed Site Plan











Appendix F – Photographs and Target Notes

| TN ref | Photograph | Notes |
|--------|--|---|
| 1 |  | Bryophyte Sample 1 |
| 2 |  | Bryophyte Sample 2 |
| 3 |  | Area of acidic grassland and upland heath |

| | | |
|---|--|------------------------------|
| 4 |  | Bryophyte Sample 3 |
| 5 |  | Juniper Scrub |
| 6 |  | Upland heath and scree |

| | | |
|---|--|-----------------------|
| 7 |  | Bryophyte Sample 4 |
| 8 |  | Bryophyte Sample 5 |
| 9 |  | Blanket Bog |

| | | |
|----|---|---------------------------------|
| 10 |  A photograph showing a narrow stream flowing through a lush, green valley. The stream is surrounded by tall grasses and mosses. The background shows rolling hills under a cloudy sky. | Bryophyte sample 6 |
| 11 |  A photograph of a stream flowing through a valley. The stream is surrounded by tall grasses and mosses. The background shows rolling hills under a cloudy sky. | Bryophyte sample 7 |
| 12 |  A close-up photograph of a stream bed. The water is clear, revealing a bed of gravel and stones. The surrounding vegetation is lush and green. | Spawning gravel (visit 2) |

Appendix G – Fish Habitat Assessment Map

