Final

NATURAL RESOURCES WALES
PEN-YR-ENGLYN TIP REMEDIATION

Habitat Condition Assessment, Floristic Survey and INNS Survey Report

Project no. 4021526

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1. Introduction

1.1 Background

Binnies UK Limited (BUKL) was commissioned by Natural Resources Wales (NRW) to undertake a Habitat Condition Assessment, Floristic Survey and invasive non-native species (INNS) survey for the Pen-Yr-Englyn Tip Remediation project. Due to noticeable changes in habitat type, an update to the Phase 1 map and habitat descriptions from the previous Phase 1 survey (ARUP, 2022) was also carried out.

The purpose of the surveys was to record the habitats in the Scheme Area following tree felling carried out over winter 2023-24; to assess the condition of those habitats; to identity rare flora species in the Scheme Area; and, to record the locations of INNS.

The findings presented in the report will be used alongside other environmental studies to inform scheme design and assessment, and to identify opportunities to provide enhancements and net benefit for biodiversity.

1.2 Scheme Location and Context

Pen-Yr-Englyn tip is situated on the eastern side of the Rhondda Fawr Valley. The Scheme Area is located directly north of Pen-Yr-Englyn, situated between the village of Treherbert to the west and the town of Treorchy to the east. The Scheme Area is centred at National Grid reference SS 94822 98025 (nearest postcode CF42 5HA) and covers approximately 0.2 km^2 (20 ha) of land.

Pen-Yr-Englyn tip was formed as a result of the historical mining waste produced by the Ynysfeio Colliery between 1854 and 1935. Mining spoil was placed on the steep slopes above mine shafts and colliery buildings. The tipping area is above residential properties, and as part of previous remediation works to cap shallow mine entries at the base of the hillside, some spoil was reprofiled to create what is now a plateau at the base of the steep slopes. The current project is to design and implement a drainage solution to reduce the pore water pressure and stabilise the tip.

The Scheme Area is situated within the County Borough of Rhondda Cynon Taff. Rhondda Cynon Taff County Borough Council (RCTCBC) land holdings own the plateau at the base of the hillside. The hillside north of the plateau is currently owned by the Welsh Government Woodland Estate (WGWE) and is managed by NRW. The location of the Scheme Area is shown in Figure 1-1 below.

The hillside in the north of the Scheme Area is crossed by Ynysfeio forest road, and a number of other forest tracks exist on the slopes. The steep slopes below the forest road were previously part of a conifer plantation but were clear-felled in winter 2023-24 to comply with a statutory plant health notice to remove the *Phytophthora ramorum* diseased trees. An area of broadleaved wet woodland on the lower slopes was retained, as was an area of mature western hemlock *Tsuga heterophylla* plantation on the western boundary of the Scheme Area (Binnies UK Ltd, 2024).

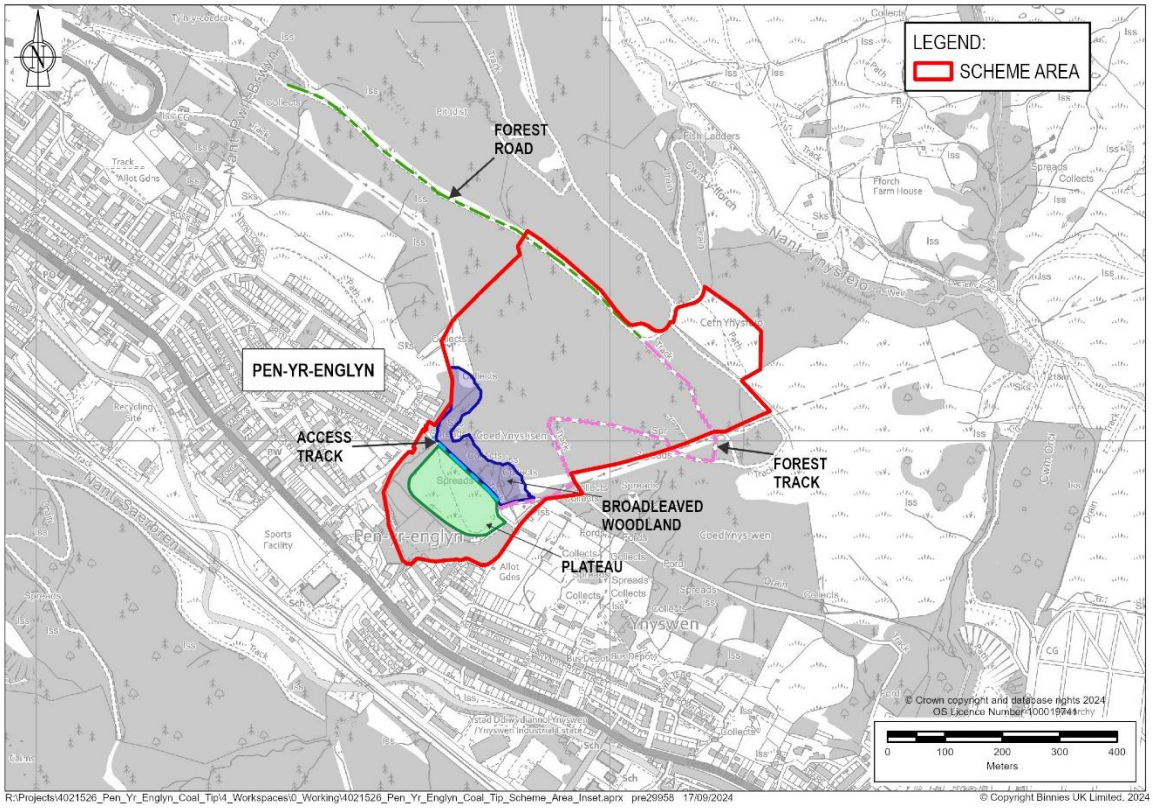

Figure 1-1: Scheme Area

2. Methodology

2.1 Updates to Phase 1 Habitat Survey and Habitat Condition Assessment

Updates to the Phase 1 Habitat Survey conducted in 2022 (ARUP, 2022) was undertaken of the Scheme Area on 4th and 5th of June 2024 in overcast light rain to dry conditions by BUKL principal ecologist Katherine Newbert (MSc) and BUKL ecologist Alex Bell (MZOO). Both are experienced botanical surveyors and ecologists who hold a level 4 field identification skill certificate (FISC) and have completed numerous Phase 1 Habitat Surveys. Katherine is currently the vice county recorder for vascular plants in Wiltshire (BBSI recorder) and a full member of CIEEM (MCIEEM).

Habitats were described and mapped following the standard Phase 1 survey methodology (JNCC, 2010). Phase 1 is a standard technique for classifying and mapping British habitats. Plant species were recorded, and habitat classified according to their vegetation type and community assemblage. Habitats were marked on a tablet and were subsequently digitised using a Geographical Information System (GIS). A Phase 1 Habitat map for the Survey Area was then prepared.

The existing condition of habitats was assessed based on professional judgement, with consideration of species diversity (see Flora Survey), vegetation structure and existing pressures.

Where appropriate, consideration was given to whether habitats qualify, or could qualify as a habitat of principal importance (HPI). HPIs are those considered to be of principal importance for the purpose of maintaining and enhancing biodiversity in relation to Wales. A national list

of HPIs has been prepared under Section 7 of the Environment (Wales) Act 2016, developed from the previous UK Biodiversity Action Plan Priority Habitat list. Consideration was based on the habitat descriptions as detailed in JNCC UK Biodiversity Action Plan Priority Habitat Descriptions.

2.2 Floristic Survey

The floristic survey was carried out at the same time as the update to the Phase 1 habitat survey to record the species composition of each habitat. Plant species lists for each habitat were compiled with relative plant species abundance estimated using the DAFOR scale. The scientific names for plant species follow those in the New Flora of the British Isles, 4th edition (Stace, 2019).

The floristic survey informed the Habitat Condition Assessment, and so the findings of the floristic survey are presented together with the habitat descriptions in Chapter 3.

Particularly notable species were target noted and are included on the Phase 1 Habitat map.

2.3 INNS Survey

The INNS survey was carried out at the same time as the Phase 1 habitat survey. Invasive plant species listed on Schedule 9 of the Wildlife and Countryside Act 1981 (as amended), Schedule 2 of the Invasive Alien Species (Enforcement and Permitting) Order 2019, and other non-native species which were evident during the survey, were target noted.

The following Biosecurity Measures were used for the site visit:

- Footwear and clothes were cleaned before entering and when leaving site using suitable disinfectant (Virkon).
- Traversing through known areas containing invasive plant species was avoided.
- Vehicles were not used to travel around the site, vehicles used to travel to site were left near site on public roads.

2.4 Limitations

Every effort has been made to provide a comprehensive and robust assessment of the Scheme Area. However, the following limitations remained during the assessment:

- The survey timing was chosen to provide an overall optimal period for identifying flora within the Scheme Area. Whilst certain species would be less likely to be recorded during this time, including ancient woodland indicators, the survey timings provided the opportunity to record the greatest range of flora species. The survey was also only conducted over two days and therefore only a selection of species which occur within the Survey Area are likely to have been recorded. This report should not be taken as providing a full and definitive list of flora for within the Scheme Area.
- The Phase 1 Habitat map has been reproduced from field notes and plans. Whilst this provides a sufficient level of detail to fulfil the requirements of this report, the maps are not intended to provide exact locations of key habitats.

However, despite the above limitations, this report is still considered to deliver a good initial assessment of the Scheme Area. The limitations above are not deemed severe enough to significantly affect the outcomes described within this report.

3. Results

3.1 Habitat and Flora Survey

A Phase 1 Habitat map for the Survey Area is presented in drawing 4021526-BUK-ZZ-00-DR-EN-00008 (Appendix A) with target notes provided in Appendix B. The following habitats were noted within the extent of the survey as shown on the Phase 1 Habitat survey map. Where appropriate a DAFOR (Dominant (D), Abundant (A), Frequent (F), Occasional (O), Rare (R), and a prefix for local abundance (L)) score has been provided to describe the abundance of plant species recorded. It should be noted that Rare in this circumstance refers to the abundance of the species within the Scheme Area context and not the national or international status of that species.

Scheme Area Overview

There were 15 Phase 1 habitat types recorded within the Scheme Area:

- Acid grassland – unimproved,
- Bare ground
- Bracken – continuous
- Broadleaved parkland/scattered trees
- Broadleaved woodland – semi-natural
- Coniferous parkland/scattered trees
- Coniferous woodland – plantation
- Coniferous woodland – recently felled
- Dry ditch
- Neutral grassland - semi-improved
- Other tall herb and fern - ruderal
- Poor semi-improved grassland
- Running water
- Scrub - scattered
- Scrub – dense/continuous

Descriptions of each habitat and their condition are provided in the following sections. Flora species lists are provided within the relevant habitat types.

The scattered scrub, and broadleaved parkland and coniferous trees, were present within other habitat types and as such are described within those habitat type descriptions.

Additionally, the southern section of the Scheme Area was considered to be open mosaic habitat on previously developed land but this HPI does not have a Phase 1 habitat code as this habitat is made up of a range of different habitat mosaics. This includes the following habitats within this Scheme Area: acid grassland – unimproved; neutral grassland – semi-improved; and, bare ground. This habitat is discussed further in Section 3.2.

Acid Grassland - Unimproved

Plateau slopes

In the south of the Scheme Area, on the slopes around the plateau, are areas of unimproved acidic grassland (see plate 1) that have naturally established on the exposed mining spoil. The grassland has an open sward with a varied sward height and areas of coal spoil which are still visible throughout.

The composition of the sward has the closest affinity to an U1 *Festuca ovina – Agrostis capilaris - Rumex acetosella* grassland*,* National Vegetation Community (NVC). This a community typical of free draining nutrient poor soils with an open sward of small tussocky grasses. Grasses in the sward include sweet vernal grass *Anthoxanthum odoratum* A, Sheep's fescue *Festuca ovina* F, heath grass *Danthonia decumbens* O and common bent *Agrostis capillaris* O with mosses and lichens covering a lot of bare ground.

The grassland assemblage has a range of positive indicator species for U1 lowland acidic grassland (JNCC, 2004), which include silver hair grass *Aira caryophyllea* R*, Cladonia sp.,* lichens O, mouse-ear hawkweed *Pilosella officinarum* F, sheeps sorrel *Rumex acetosella O* and *Potentilla erecta R.* The grassland has no negative indicator species that show evidence of nutrient enrichment. A full species list can be seen in Table 3.1 below.

The acidic grassland areas on the slopes are becoming encroached by scattered scrub including invasive non-native cotoneaster species *Cotoneaster horzontalis* (Target Note 4).`

Waxcaps are also found present within the acidic grassland, see Plate 2.

The condition of the unimproved acidic grassland on the slopes around the plateau was assessed to be Moderate, with the presence of invasive species preventing it from being in Good condition. Further encroachment by scrub could affect the extent of this habitat in the future.

Plate 1: Area of acidic grassland of edge of plateau.

Plate 2: Wax cap species within acidic grassland in the south of the Scheme Area.

Table 3.1 - Species list for unimproved acidic grassland in the south of the Scheme Area

Scientific Name	English Name	Frequency (DAFOR)
Anthoxanthum odoratum	Sweet vernal grass	A
Festuca ovina	Sheeps fescue	F
Pilosella officinarum	Mouse-ear hawkweed	F
Trifolium arvense	Hares foot clover	F
Danthonia decumbens	Heath grass	O
Hypochaeris radicata	Cat's ear	O
Ulex gallii	Western gorse	O
Agrostis capillaris	Common bent	O
Cladonia sp.	A Lichen	O
Peltigera membranacea	Dogs tooth lichen	O
Trifolium dubium	Lesser trefoil	O
Plantago lanceolata	Ribwort plantain	O
Festuca rubra	Red fescue	O
Achillea millefolium	Common yarrow	O
Rumex acetosella	Sheep's sorrel	O
Potentilla erecta	Tormentil	R
Luzula multiflora	Heath woodrush	R
Calluna vulgaris	Common heather	R
Aira caryophyllea	Silver hair grass	R
Cynosurus cristatus	Crested dogs' tail	R
Hypericum perforatum	Perforate St John's wort	R
Carlina vulgaris	Carline thistle	R
Vicia sativa	Common vetch	R
Cotoneaster horizontalis	Wall spray cotoneaster	R
Trifolium pratense	Red clover	R
Rubus fruticosus agg.	Bramble	R

Northern section of Scheme Area

A small area of unimproved acidic grassland is present on the edge of a young conifer plantation in the north of the Scheme Area. This grassland has a closer affinity to a U4 *Festuca ovina – Agrostis capillaris - Galium saxatile* grassland NVC community, which has a closed

sward and is a more typical acidic grassland community found throughout Wales. Three species of cotoneaster were recorded, including *Cotoneaster horzontalis*.

The area of unimproved acidic grassland in the north of the Scheme Area was assessed to be in Poor condition as the species composition and vegetative structure was a poor match for the habitat type, with invasive species also present.

Bare Ground

There are several paths and motorbike tracks throughout the Scheme Area. These are comprised of bare ground and have scattered vegetation along the edges. Trackways were present through the areas of felled woodland; these areas are completely churned up from forestry machinery with a large amount of brash and dead wood left along the trackways.

These areas of bare ground were in Poor condition as a habitat from their use as access tracks. Smaller patches of loose and bare substrate were present within other habitats, and are described as a part of those habitats.

Bracken – Continuous

There are large stands of continuous bracken *Pteridium aquilinum* present around the boundaries of the Scheme Area with limited other species growing throughout. Rosebay willow herb *Chamaenerion angustifolium* and foxglove *Digitalis purpurea* occur occasionally throughout the tall dense stands of vegetation.

Bracken stands can provide shelter for a range of fauna species, and stands can provide cover for lower ground flora especially earlier in the year (e.g. violets) which can support invertebrates. However, the height and density of the stands within the Scheme Area, and lack of structural and floristic diversity observed during the survey carried out in late spring / early summer, means this habitat was assessed as being in Poor condition.

Broadleaved Woodland - Semi-Natural

Semi-natural broadleaved woodland is present at the centre of the Scheme Area, at the bottom of the hill (Plate 3).

The woodland is dominated by willow species. Goat willow *Salix caprea* and grey willow *Salix cinerea* were the most abundant; a full species list can be seen in Table 3.2 below. Water flushing down the hillside and pooling in this area is making the ground waterlogged for much of the year.

Other species within this woodland include downy birch *Betula pubescens* O, ash *Fraxinus excelsior* O, rowan *Sorbus aucuparia* O, pedunculate oak *Quercus robur* R and sycamore *Acer pseudoplantus* R with some conifers occurring rarely.

There is a large stand of Japanese knotweed *Reynoutria japonica* (Plate 4, Target Note 14) located along the edge of the woodland.

Montbretia *Crocosmia x crocosmiiflora*. another Schedule 9 invasive species, is present within the woodland understorey (Target Note 8).

The understorey has large stands of bramble *Rubus fruticosus agg.* F. Ash saplings and seedlings are frequent throughout. The non-native Wilsons honey suckle *Lonicera nitida* is a rare occurrence in the understorey. This is likely an escape from nearby gardens.

The ground flora of the woodland is varied. Water, that appeared to be runoff from the hillside, runs through part of the woodland creating waterlogged conditions suitable for a range of plant species. Species include water mint *Mentha aquatica* LO, soft rush *Juncus effusus* LO, yellow pimpernel *Lysimachia nemorum* LF and floating sweet grass *Glyceria fluitans* LO. Grasses are frequent throughout more open sections of the woodland, which include creeping soft grass *Holcus mollis* F and rough meadow grass *Poa trivialis* F. A number of ferns are also present, including male fern *Dryopteris filix-mas* F, scaley male fern *Dryopteris affinis* R, lady fern *Athyrium filix-femina* O, broad buckler fern *Dryopteris dilatata* F and soft shield fern *Polystichum setiferum* R.

Towards the north-western section of the woodland, there is an area where water was coming down off the hillside on the edge of the woodland. Target Note 17 shows where ivy leaved bellflower *Wahlenbergia hederacea* R is located on the edge of the water. This species is currently listed as Near threatened in the revised 2021 vascular plant red list for Great Britain, however in the Red list for Wales this species is listed as of Least Concern as is overall more frequent throughout Wales. Target Note 18 shows where the water ends into a small pool, which has feathery bog moss *Sphagnum cuspidatum* present (a common species of bog pools).

The area of semi-natural broadleaved woodland was assessed to be in Moderate condition, due to the lack structural diversity and age classes and invasive species present within the woodland.

Plate 3: Broadleaved semi-natural woodland

Plate 4: Japanese knotweed located in broadleaved woodland understory

Table 3.2 - Species list for semi-natural broadleaved woodland

Scientific Name	English Name	Frequency (DAFOR)
	Canopy	
Salix caprea	Goat willow	A
Salix cinerea	Grey willow	A
Betula pubescens	Downy birch	O
Fraxinus excelsior	Common ash	O
Sorbus aucuparia	Rowan	O
Acer pseudoplantus	Sycamore	R
Quercus robur	Pedunculate oak	R
	Understory	
Rubus fruticosus agg	Bramble	F
Fraxinus excelsior	Common ash (saplings)	F
Lonicera nitida	Wilsons honey suckle	R
	Ground flora	
Mentha aquatica	Water mint	LO
Juncus effusus	Soft rush	LO
Lysimachia nemorum	Yellow pimpernel	LF
Glyceria fluitans	floating sweet grass	LO
Holcus mollis	Creeping soft grass	F
Poa trivialis	Rough meadow grass	F
Dryopteris filix-mas	Male fern	F
Dryopteris affinis	Scaley male fern	R
Athyrium filix-femina	Lady fern	O
Dryopteris dilatata	Broad buckler fern	F
Polystichum setiferum	soft shield fern	R
Wahlenbergia hederacea	Ivy leaved bellflower	LR

Coniferous Woodland – Plantation

There is a small area of coniferous plantation woodland on the top of the hill. This is a mixture of Lodgepole pine *Pinus contorta ssp contorta A* which was abundant, Sitka spruce *Picea sitchensis F* and hybrid larch *Larix x marschlinsii O*. There were several young self-set saplings in this young woodland area, including rowan LO and downy birch LO, (Plate 5).

The trees in this area are fairly young and scattered in some areas, resulting in a canopy that is relatively open with lots of light reaching the ground flora. The ground flora present is relatively scattered and made up of acid species, including common heather F, sweet vernal grass *F*, purple moor grass *Molinia caerulea* O, mouse-ear hawkweed O, heath speedwell O, bilberry *Vaccinium myrtillus* R and sheeps bit, *Jasione montana R*. The track running through the woodland is churned up by machinery and has seasonally wet areas in and alongside it, which support a range of sedge species as well as other species of damp habitats. A full species list can be seen in Table 3.3 below.

On the western Scheme Area boundary, there is a mature block of coniferous woodland plantation that is dominated by western hemlock spruce *Tsuga heterophylla* (Plate 6). The understory has heavy pine needle litter and has little to no ground flora, with only occasional fern species present.

Both areas of plantation conifer woodland were assessed to be in Poor condition, due to the lack of species and structural diversity and age classes within the woodland.

Plate 5: Young conifer plantation in the north of the Scheme Area

Plate 6: Conifer plantation to the west of the Scheme Area

Table 3.3 - Species list for young plantation woodland understorey, in the north of the Scheme Area

Scientific Name	English Name	Frequency (DAFOR)
Calluna vulgaris	Common heather	F
Anthoxanthum odoratum	Sweet vernal grass	F
Rhytidiadelphus squarrosus	Springy turf moss	O
Pilosella officinarum	Mouse-ear hawkweed	O
Polysticum juniperinum	Juniper haircap moss	O
Molinia caerulea	Purple moor grass	O
Hypochaeris radicata	Cat's ear	O
Veronica offincinalis	Heath speedwell	O
Agrostis capillaris	Common bent	O
Potentilla erecta	Tormentil	O
Cladonia sp.	A Lichen	O
Juncus conglomeratus	Compact rush	O - track edges
Carex pallscens	Pale sedge	LO
Carex demissa	Common yellow sedge	LO – track edges
Isolepis setacea	Bristle club rush	LO – on track edges
Carex binervis	Green ribbed sedge	R
Carex hostiana	Tawny sedge	R
Carex nigra	Common sedge	R
Vaccinium myrtillus	Bilberry	R
Trifolium dubium	Lesser trefoil	R
Jasione montana	Sheeps bit	R
Festuca ovina	Sheeps fescue	R

Coniferous Woodland – Recently Felled

The majority of the Scheme Area is made up of recently felled conifer plantation woodland that has been felled over the 2023/2024 winter, see Plate 7. Vegetation is beginning to grow back but this is overall very patchy. A list of species can be seen in Table 3.4 below. Bilberry is located in patches, in areas clear of deadwood. Large amounts of deadwood are still present

throughout this area and there is damage to the ground from machinery. Some small broadleaved trees, including downy and pedunculate oak, are remaining but these were scattered across the hillside.

There is a stand of Japanese knotweed located around Target Note 13. This is within the area of felled woodland bordering the area of broadleaved wet woodland to the south.

Table 3.4 – Species list for recently felled coniferous woodland

Scientific name	English name	Abundance (DAFOR)
Anthoxatum odoratum	Sweet vernal grass	F
Galium saxatile	Heath bedstraw	F
Pteridium aquilinum	Bracken	F
Vaccinium myrtillus	Bilberry	LF
Avenella flexuosa	Wavy hair grass	LF
Betula pubescens	Downy birch	LO
Quercus robur	Pedunculate oak	LO
Dryopteris felix mas	Male fern	O
Dryopteris affinis	Scaly male fern	O
Digitalis purpurea	Foxglove	O
Chamaenerion angustifolium	Rosebay willowherb	O
Rubus fruticosus agg.	Bramble	O
Holcus mollis	Creeping soft grass	O
Carex pilulifera	Pill sedge	O
Hypericum pulchrum	Slender St John's wort	R
Dryopteris dilatata	Broad buckler fern	R
Luzula multiflora	Heath woodrush	R
Carex laevigata	Smooth stalked sedge	R
Carex echinata	Star sedge	R

The most frequent species found throughout the area of felled woodland are sweet vernal grass, heath bedstraw *Galium saxatile,* bracken and wavy hair grass *Avenella flexuosa.*

Prior to felling, the woodland was a conifer plantation in bad health (the reason for felling) and was likely to resemble similar plantations in the area, which would suggest that condition prior to felling would be also Poor.

However, the habitat is currently an ecotone, as it is transitioning into tall ruderal with patches of self-seeded broadleaved trees on coal spoil. As this is a transition habitat it is difficult to apply a condition assessment but such habitats have a good biodiversity value and likely of higher value than when it was a conifer plantation. In the short term and without management the habitat will likely transition into more of a tall ruderal community and in the medium term develop into a scrub mosaic, supporting a different community of species. Mosaic habitats generally have a good biodiversity value. Eventually it is likely this would transition to become scrub dominated. Areas of self-seeded conifer and broadleaved trees may also develop, although the poor soils of the coal tip area would likely mean growth of broadleaved trees would be slow.

Plate 7: Recently felled coniferous woodland looking to the south of the Scheme Area

Dry Ditch

A seasonally wet ditch that is clogged with debris from the slopes of the Scheme Area is present at the bottom of the hill, acting as a boundary for the semi-natural broadleaved woodland. There is a lack of in-ditch and marginal vegetation due to the overhead canopy from adjacent woodland.

The ditch was assessed to be in Moderate condition, due to the lack of vegetation.

Poor Semi-Improved Grassland

At the top of the hillside, there is a a small area of poor semi-improved grassland that has developed along the edge of the felled woodland. A list of species can be seen in Table 3.5 below. The grassland has previously been churned up by forestry machinery and appears to become waterlogged throughout the winter as hairy sedge *Carex hirta*, soft rush and compact rush were frequent. Grass species are limited to Yorkshire fog F, red fescue *Festuca rubra* F and sweet vernal grass O. Forb species are infrequent throughout and are limited to creeping buttercup *Ranunculus repens* A, tormentil R, heath bedstraw R, greater birds foot trefoil *Lotus pedunculatus* R and common nettle *Urtica dioica R*.

This grassland is closest to a MG10 *Holcus lanatus – Juncus effusus* rush pasture NVC community.

The habitat was assessed to be in Poor condition due to low number of species present within the sward and damage to the ground from machinery.

Table 3.5 – Species list for poor semi-improved grassland

Scientific name	English name	Abundance (DAFOR)
Anthoxatum odoratum	Sweet vernal grass	O
Potentilla erecta	Tormentil	R
Galium saxatile	Heath bedstraw	R
Lotus pedunculatus	Greater birds foot trefoil	R
Urtica dioica	Common nettle	R
Ranunculus repens	Creeping buttercup	A
Festuca rubra	Red fescue	F
Holcus lanatus	Yorkshire Fog	F
Juncus conglomeratus	Compact Rush	F
Juncus effusus	Soft rush	F
Carex hirta	Hairy sedge	F

Other Tall Herb and Fern - Ruderal

To the north, bordering the young conifer plantation, there is a a stand of tall ruderal vegetation made up of a mixture of tall forbs including rosebay willowherb F, male fern O, bracken F, marsh thistle R and bramble O (Table 3.6).

The tall ruderal vegetation in this area is in Poor condition due to the low species diversity, and lack of any clear vegetative classification group.

Small areas of tall ruderal vegetation are also present on the west edge of the Scheme Area adjacent to the broadleaved woodland, and on the south-west edge bordering an extensive area of dense scrub. The species composition and condition assessments match the other tall herb and fern – ruderal located in the north.

Table 3.6 – Species list for other tall herb and fern - ruderal

Scientific name	English name	Abundance (DAFOR)
Chamaenerion angustifolium	Rosebay willowherb	F
Dryopteris felix mas	Male fern	O
Pteridium aquilinum	Bracken	F
Cirsium palustre	Marsh thistle	R
Rubus fruticosus agg.	Bramble	O

Running Water

A man-made watercourse runs throughout the Scheme Area, connected via underground culverts (Plate 8). The watercourse runs along the western and southern edge of the Scheme Area, going through the semi-natural broadleaved woodland and continuous scrub. The watercourse is filled with material that has collected from the slope, such as loose scree/rubble. No macrophytes are present within the watercourse. Fly-tipping is present on the western stretches of the watercourse.

The watercourse was assessed as Moderate condition, due to the lack of morphological diversity and macrophytes, and presence of fly-tipped material.

Plate 8: Running water, along edge of semi-natural broadleaved woodland

Scrub – Dense/Continuous

Dense scrub is present around the slopes of the plateau, appearing unmanaged. Bramble is a dominant component throughout. Other species include hawthorn *Crataegus monogyna*, blackthorn *Prunus spinosa,* goat willow, holly *Ilex aquifolium* and buddleia *Buddleja davidii* occurring occasionally.

Areas of dense scrub across the Scheme Area were assessed to be in Moderate condition due to the presence of the non-native species buddleia being present, and the lack of clearings, glades or rides.

Neutral Grassland - Semi-improved

There is an area of semi-improved neutral grassland that has developed in the south of the Scheme Area, on a plateau of coal mining waste (see Plate 9). The area has regenerated and is now covered with grassland vegetation except on pathways used by walkers and motorbike riders. The ground in these areas is bare and coal waste is still visible on the surface. This area is a mosaic of dry to wetter grassland and some areas appear to be seasonally inundated. It is floristically diverse due to the industrial past of the Scheme Area, which has created a mosaic of habitats ranging from dry to wet.

The areas of grassland that are seasonally inundated have a variety of species including marsh speedwell *Veronica scutellata* R (Target Note 3), southern marsh orchids *Dactylorhiza praetermissa* (Target Notes 1, 2 and 16) R, common fleabane *Pulicaria dysenterica* R, tufted hair grass *Deschampsia cespitosa* O, marsh bedstraw *Galium palustre* O, hard rush *Juncus inflexus* O, marsh thistle *Cirsium palustre* R and a range of sedge species indicative of wet to seasonally inundated conditions such as hairy sedge A, common yellow sedge *Carex demissa* R, false fox sedge *Carex otrubae* R and oval sedge *Carex leporina* F.

Drier areas of the grassland have a higher abundance of grass species with the most abundant throughout the sward being sweet vernal grass. Other species include crested dogs tail *Cynosurus cristatus* F, cocks foot *Dactylis glomerata* O, Yorkshire fog O and smooth meadow grass *Poa pratensis* R. Sedges are still frequent throughout the entire sward with hairy sedge, oval sedge, glaucous sedge *Carex flacca* and spiked sedge *Carex spicata* being the most frequent within the sward. Forb species were diverse and in the drier areas include occasional meadow buttercup *Ranunculus acris,* common birds foot trefoil *Lotus corniculatus,* red clover *Trifolium pratense,* white clover *Trifolium repens,* ribwort plantain *Plantago lanceolata* and fairy flax *Linum catharticum.* A full species list can be found in Table 3.7 below.

Where the grassland runs adjacent to the footpath to the north of this area, scattered goat willow scrub becomes more frequent and the sward height is taller, more tussocky and less diverse (Plate 10).

The semi-improved neutral grassland was assessed as being in Moderate condition as quadrats showed that the sward had fewer than 10 species per meter squared; semi-improved neutral grassland in good condition would be expected to have a greater diversity. Further encroachment and increases in density of the scattered scrub could affect the future extent and condition of this habitat.

Plate 9: Area of semi-improved neutral grassland

Plate 10: Along track between the woodland and the bare ground the grassland was less diverse and had willow scrub occurring frequently

Table 3.7 – Species list for semi-improved neutral grassland

Scientific Name	English Name	Frequency (DAFOR)
Anthoxanthum odoratum	Sweet vernal grass	A
Carex hirta	Hairy sedge	A
Cynosurus cristatus	Crested dogs' tail	F
Ranunculus acris	Meadow buttercup	F
Carex leporina	Oval sedge	F
Plantago lanceolata	Ribwort plantain	F
Juncus effusus	Soft rush	LF
Carex flacca	Glaucous sedge	O
Holcus lanatus	Yorkshire fog	O
Dactyls glomerata	Cock's foot	O
Ranunculus repens	Creeping buttercup	O
Trifolium repens	White clover	O
Equisetum arvense	Field horsetail	O
Hypericum perforatum	Perforate St John's wort	O
Carex spicata	Spiked sedge	O
Juncus inflexus	Hard rush	O
Lotus corniculatus	Birds foot trefoil	O
Hypochaeris radicata	Cat's ear	O
Trifolium pratense	Red clover	O
Crepis vesicaria	Beaked hawk's-beard	O
Festuca rubra	Red fescue	O
Galium palustre	Marsh bedstraw	LO
Potentilla anserina	Silverweed	LO
Dactylorhiza praetermissa	Southern marsh orchid	R
Bromus hordeaceus	Soft brome	R
Centaurea nigra	Common knapweed	R
Poa pratensis	Smooth meadow grass	R
Trifolium dubium	Lesser trefoil	R
Juncus tenuis	Slender rush	R – track edges
Pulicaria dysenterica	Common fleabane	R
Taraxacum officinale agg.	Dandelion	R
Geranium dissectum	Cut leaved crane's-bill	R
Carex remota	Remote sedge	R
Carex otrubae	False fox sedge	R
Vicia sativa	Common vetch	R
Vicia sepium	Bush vetch	R
Juncus conglomeratus	Compact rush	R
Luzula campestris	Field wood rush	R
Cirsium palustre	Marsh thistle	R
Linum catharticum	Fairy flax	R
Deschampsia cespitosa	Tufted hair grass	R
Carex demissa	Common yellow sedge	R
Rumex crispus	Curled dock	R
Prunella vulgaris	Self-heal	R
Jacobaea vulgaris	Common ragwort	R
Veronica scutellata	Marsh speedwell	LR
Rubus fruticosus agg.	Bramble	R

3.2 Habitats of Principal Importance

Habitats of Principle Importance within the Scheme Area are shown on drawing 4021526-BUK-ZZ-00-DR-EN-00011 (Appendix C) and described below.

Open Mosaic Habitat on Previously Developed Land

Due to the previous history as a colliery, the lower plateau within the Scheme Area was made up of coal spoil that had been left as a waste heap and flattened out.

Many coal tips support a complex mosaic of habitats owing to their highly varied topography, aspects, gradients, pH and substrate composition. This mosaic would fall under the habitat type commonly referred to as Open Mosaic Habitats on Previously Developed Land (OMHPDL).

Old coal tips often support diverse and intricate mosaics of heathland, flower-rich grassland, species-rich lichen and moss communities, scrub, woodland and wetlands.

At least five criteria need to be met for a brownfield site to qualify as OMHPDL (Joint Nature Conservation Committee, 2010):

1. The area of open mosaic habitats is at least 0.25 ha in size.

2. There must be a known history of disturbance at the site or evidence that soil has been removed or severely modified by the previous use(s) of the site. Extraneous materials/ substrates such as industrial spoil may have been added.

3. The site contains some vegetation that will comprise early successional communities consisting mainly of stress-tolerant species (e.g. indicative of low nutrient status or drought). Early successional communities are composed of a) annuals or b) mosses/liverworts or c) lichens or d) ruderals or e) inundation species or f) open grassland or g) flower-rich grassland or h) heathland.

4. The site contains unvegetated, loose, bare substrate and pools may be present.

5. The site shows spatial variation, forming a mosaic of one or more of the early successional communities (a)–(h) above (criterion 3) plus bare substrate, within 0.25ha.

The southern section of the Scheme Area around the plateau of coal spoil waste is over the threshold area size (>0.25 ha) to qualify as this habitat type under criteria 1. Also, with the known history of coal mining and the spoil deposits meets the disturbance criteria 2 for OMHPDL.

Overall, the habitats in the southern section of the Scheme Area are typical of OMHPDL. The habitats that fit within this priority habitat are unimproved acid grassland, bare ground and area of semi-improved neutral grassland (refer to previous sections for species lists for the acid grassland and semi-improved neutral grassland). Within these habitats are habitat mosaics that were too fine to map using Phase 1 habitat classification.

The following communities were found present, which satisfies the requirements for condition 3:

- Lichens present on open bare coal spoil slopes
- Ruderal species found as ecotones between scrub
- Inundation areas within the grassland sward creating temporary pools supporting wetter plant communities
- Open grassland
- Flower rich grassland.

The Scheme Area has areas of loose bare substrate on the top of the plateau and the slopes. Pools were observed within the grassland which satisfies criteria 4. The mosaic of habitats as detailed above along with the areas of bare ground meet criteria 5.

Due to passing all 5 criteria listed above, the lower section of the Scheme Area is considered open mosaic habitat.

The condition of the OMHPDL was assessed to be Moderate, due to the presence of invasive species, as noted in the constituent unimproved acid grassland and semi-improved neutral grassland habitats.

Lowland Dry Acid Grassland

The areas of unimproved acid grassland around the edges of the plateau in the southern part of the Scheme Area meet the criteria to be lowland dry acid grassland HPI (Joint Nature Conservation Committee, 2008a).

The grassland was shown to have a species composition standard of a U1 *Festuca ovina – Agrostis capilaris - Rumex acetosella* grassland, which is listed as one of the NVC communities associated with lowland dry acid grassland. The grassland includes a range of positive indicator species for U1 lowland acidic grassland (JNCC, 2004).

The condition of the lowland dry acid grassland on the slopes around the plateau was assessed to be Moderate, due to the presence of invasive species.

For clarity, the area of unimproved acidic grassland in the north of the Scheme Area does not meet the criteria for an HPI.

Wet woodland

The broadleaved woodland within the Scheme Area is classified as wet woodland, a habitat of principal importance which isn't a separate habitat classification within the Phase 1 habitat classification categories and falls under the broadleaved woodland habitat classification (Joint Nature Conservation Committee, 2008b).

The following factors were used to identify the wet woodland:

- The canopy was dominated by goat willow and grey willow.
- Ground flora indicator species were present species included water mint, soft rush, yellow pimpernel and floating sweet grass.

- Water flushing down the hillside and pooling within the woodland making the ground waterlogged for much of the year.

The condition of the wet woodland was assessed to be Moderate due to the lack structural diversity/age classes and invasive species present within the woodland.

3.3 Invasive Non-Native Species (INNS)

During the survey the following INNS were observed within the Scheme Area. Locations of where INNS were found were target noted and shown on drawing 4021526-BUK-ZZ-00-DR-EN-00008 (Appendix A).

- Japanese knotweed - *Reynoutria japonica* - Target notes – 13 and 14
- Montbretia - *Crocosmia × crocosmiiflora* - Target notes - 8, 11, 12 and 15
- Wall spray cotoneaster – *Cotoneaster horzontalis* - Target notes – 4, 6 and 9
- Buddleia - *Buddleja davidii* – found in dense scrub on slopes of coal spoil
- Rhododendron – *Rhodondendron ponticum* – Target note – 10.

3.4 Notable Plant Species

During the survey the following notable plant species were observed within the Scheme Area. Locations of where INNS were found were target noted and shown on drawing 4021526-BUK-ZZ-00-DR-EN-00008 (Appendix A).

- Ivy leaved bellflower is located on the edge of the water. This species is currently listed as Near threatened in the revised 2021 vascular plant red list for Great Britain, however in the Red list for Wales this species is listed as of Least Concern as is overall more frequent throughout Wales.
- Southern marsh-orchids are located in sections of the semi-improved neutral grassland that were seasonally inundated. Whilst not having a specific conservation status, it was noted as the species requires a symbiotic mycorrhizal fungi which is essential for terrestrial orchid seed germination, and so suitable habitats are difficult to replicate. The species is indicative of biodiverse habitats and orchids are valued by local communities.

4. Conclusions and Recommendations

4.1 Habitat and Flora Survey

The updated Phase 1 Habitat Survey for the Pen-Yr-Engyln Tip Remediation project identified that the Scheme Area was dominated by recently felled coniferous woodland on the steep hillside slopes in the northern half of the Scheme Area, with an area of wet broadleaved semi natural woodland along the toe of the slopes. The flat area of the plateau that extends out from the base of the slope was dominated by neutral semi-improved grassland with an area of acid unimproved grassland. The slopes of the plateau were dominate by dense scrub. Areas of bracken, tall ruderal vegetation and bare ground were present within these habitats. There

are small water courses and a dry ditch that go through the broadleaved semi natural woodland, grassland and scrub areas which add to the diversity of these habitats.

Within the Scheme Area, to the north of the steep hillside slopes, is an area of young conifer plantation, with patches of bare ground, poor semi-improved grassland, neutral semi-improved grassland, unimproved acid grassland, tall ruderal vegetation and bracken around it.

The condition of the broadleaved semi natural woodland, poor semi-improved grassland, neutral semi-improved grassland and unimproved acid grassland is affected by encroaching scrub and invasive species, so these habitats are assessed as Moderate condition. The bracken stand and tall ruderal vegetation have limited species and structural diversity and so are assessed as Poor condition. The recently felled coniferous woodland is starting to regenerate, with indications that the habitat might initially transition into more of a tall ruderal community. Scattered broadleaved trees suggest that habitat could be transitioned into broadleaved woodland with a planting regime although tree growth rates would likely be slow due to poor soils. Alternatively, the recently felled area could be managed to keep it as a habitat mosaic.

Notable flora species identified in the Scheme Area comprise of the following species:

- Ivy leaved bellflower
- Southern marsh-orchid

4.2 Habitats of Principal Importance

Three HPIs classified under S41 of the Natural Environment and Rural Communities (NERC) Act, 2006 were identified within the Scheme Area:

- Open mosaic habitat on previously developed land - on the plateau
- Lowland dry acid grassland - on the plateau
- Wet woodland – the broadleaved semi-natural woodland.

4.3 Invasive Non-native Species

Four invasive species are present throughout the site; Japanese knotweed which was found in two locations, montbretia and wall spray cotoneaster which are all listed under Schedule 9 of the Wildlife and Countryside Act 1981 (as amended). Additionally, buddleia was also found on site. Whilst not listed under Schedule 9 of the Wildlife and Countryside Act 1981 (as amended) it is known as an invasive plant and it is particularly problematic in south Wales.

4.4 Recommendations

Direct impacts to HPIs should be avoided where possible by project design and construction planning and be minimised where avoidance is not possible. Potential indirect effects from changes in the tip drainage regime to HPIs should also be considered by the project design.

The following measures are recommended to improve the condition and resilience of the habitats, and to support and manage the flora species present. The measures could be

implemented as part of project design and delivery to mitigate project impacts on habitats and to deliver net benefit for biodiversity.

Semi-natural broadleaved woodland/wet woodland

- Removal of the large stands of Japanese knotweed and montbretia.
- Targeted thinning/clearance to create rides within the woodland to increase light levels to ground flora.

Open mosaic habitat (including lowland dry acidic grassland and semi-improved neutral grassland)

- Removal of INNS species and selective clearance of scrub to provide more areas of open bare ground, control scrub encroachment and provide more light to enable species diversity.
- The section of the habitat where lichen is growing on coal spoils should be maintained, with maintenance to ensure no encroachment by scrub/hardy grass species.
- The grass should be cut between August and September, to allow light and air in for propagation where wildflowers have set seed.
- Permanent ponds can be created to provide greater variation in habitat.

Recently felled plantation

- **Option 1 – reinstate as broadleaved woodland**
    - Planting mix comprising trees native to the Rhondda Valley and of local provenance. Species should include sessile oak *Quercus petraea,* rowan and downy birch.
    - Maintain / enhance pockets of bare ground to function as rides and glades.
    - Ensure that regenerating broadleaved trees are maintained which, when combined with new planting, will create diversity in age groups within the regenerating woodland.
- **Option 2 – Manage as a habitat mosaic on coal spoil**
    - Prevent succession by managing bracken, scrub and trees.
    - Create scrapes to hold water.
    - Create and maintain areas of bare ground.
    - Fire breaks, if required, could form part of design / management.

Watercourses

- Removal of fly-tipping within the water.

- Create areas of slower running water to encourage the growth of macrophytes and invertebrates who prefer slower running water.

Bracken

- The areas of continuous bracken could be selectively cut in rotation to promote structural and floristic diversity and to prevent further encroachment into adjacent habitats.

- Smaller areas of bracken within grassland, and ruderal habitats should be selectively managed to ensure it does not encroach into priority grassland and OMHPDL habitats. In addition, it should be managed in areas of notable plants.

Invasive non-native Species

As noted above, there may be opportunities to remove invasive plant species from the Scheme Area as part of positive interventions to manage and improve habitats. However, this may not always be possible, it may take several years to eradicate a stand, and construction works do pose a risk of causing the spread of INNS. It is recommended that drainage design and planned working areas avoid known stands of INNS. Mitigation to avoid and stop the spread of invasive species should be detailed in the Environmental Action Plan (EAP) and Construction Environmental Management Plan (CEMP). This will provide a Biosecurity Risk Assessment for contractors to follow which will include methods to prevent the spread of invasive species, including Japanese knotweed within and outside the Scheme Area.

5. References

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Appendix A: Phase 1 Habitat Survey Map

Drawing no. 4021525-BUK-ZZ-DR-EN-00008

Note: The limits, including the height and depths of the Works, shown in this drawing are not to be taken as limiting the obligations of the contractor under Contract.

LEGEND

- A1.1.1 - BROADLEAVED WOODLAND - SEMI-NATURAL
- A1.2.2 - CONIFEROUS WOODLAND - PLANTATION
- A2.1 - SCRUB - DENSE/CONTINUOUS
- A2.2 - SCRUB - SCATTERED
- A4.2 - CONIFEROUS WOODLAND - RECENTLY FELLED
- B1.1 - ACID GRASSLAND - UNIMPROVED
- B2.2 - NEUTRAL GRASSLAND - SEMI-IMPROVED
- B6 - POOR SEMI-IMPROVED GRASSLAND
- C1.1 - BRACKEN - CONTINUOUS
- C3.1 - OTHER TALL HERB AND FERN - RUDERAL
- J4 - BARE GROUND
- PHASE ONE HABITAT SURVEY AREA
- TARGET NOTE
- G2 - RUNNING WATER
- J2.6 - DRY DITCH
- A2.2 - SCRUB - SCATTERED
- A3.1 - BROADLEAVED PARKLAND/SCATTERED TREES
- A3.2 - CONIFEROUS PARKLAND/SCATTERED TREES

SAFETY HEALTH AND ENVIRONMENT INFORMATION
IN ADDITION TO THE HAZARDS OR RISKS NORMALLY ASSOCIATED WITH THE TYPES OF WORK DETAILED ON THIS DRAWING, THE FOLLOWING SIGNIFICANT RESIDUAL RISKS SHOULD BE NOTED. FURTHER DETAILS ARE INCLUDED IN THE CDM DESIGN RISK MANAGEMENT REGISTER
CONSTRUCTION
N/A
MAINTENANCE / CLEARING / OPERATION
N/A
DECOMMISSIONING / DEMOLITION
N/A

Rev	Drawn	Chkd	Rvwd	Apprvd	Date	Description
P02	AP	AB	ES	AH	05/11/2024	FOR INFORMATION
P01	TW	KN	ES	AH	22/08/2024	FOR INFORMATION

Designed by: TW Date: NOVEMBER 2024

Client:

Cyfoeth Naturiol Cymru Natural Resources Wales

Client Drawing No. | Revision

Binnies UK Limited
Registered Office
Spring Lodge, 172 Chester Road, Helsby, Cheshire, WA6 0AR UK
Tel: +44(0)1737 774155

Project:

PEN YR ENGLYN

Drawing title:

PHASE 1 HABITAT SURVEY

Drawing scale: 1:2,500 Sheet size: A3

Drawing no. 4021526-BUK-ZZ-00-DR-EN-00008 | Revision P02

0 50 100 150 200 250
Metres
SCALE 1:2,500

Print Version: Print Quality (300dpi @ A3)

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Appendix B: Phase 1 Habitat Survey Target Notes

Target notes listed on drawing – 4021525-BUK-ZZ-DR-EN-00008

Ref	NGR	Description	Photo
1 & 2	SS946989 7904	Southern marsh orchid locations, close enough to fall under same NGR.	

3	SS947079 7892	Marsh speedwell in wet depression.	

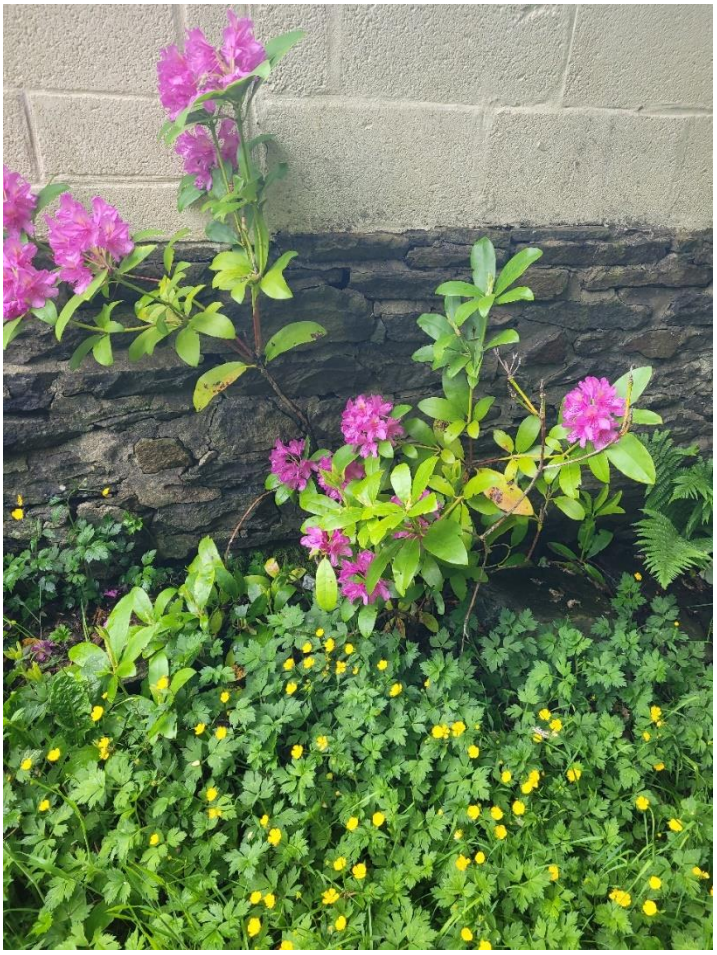
4	SS947259 7815	Wall spray cotoneaster.	

5	SS947279 7828	Waxcaps present in acidic grassland.	

6	SS946299 7921	Mix of cotoneaster species on slope over 3x5m area.	

7	SS946329 7937	Acid grassland with heather present, becoming overgrown with scrub.	
8	SS947459 7973	Montbretia present in broadleaved woodland.	

9	SS947389 7796	Wall spray cotoneaster.	

10	SS947069 7792	Area of rhododendron behind the back of residential gardens.	

11	SS946899 7782	Area of Montbretia 5x3m stand on mound behind residential properties.	
12	SS946849 7792	Scattered patches of Montbretia alongside track edges behind residential properties.	

13	SS947379 8001	Large stand of the Japanese knotweed in area of clearer coniferous woodland bordering the broadleaved woodland and trackway.	No photo available.
14	SS947439 8045	Stand of Japanese knotweed under broadleaved woodland canopy, 5x5m in size.	

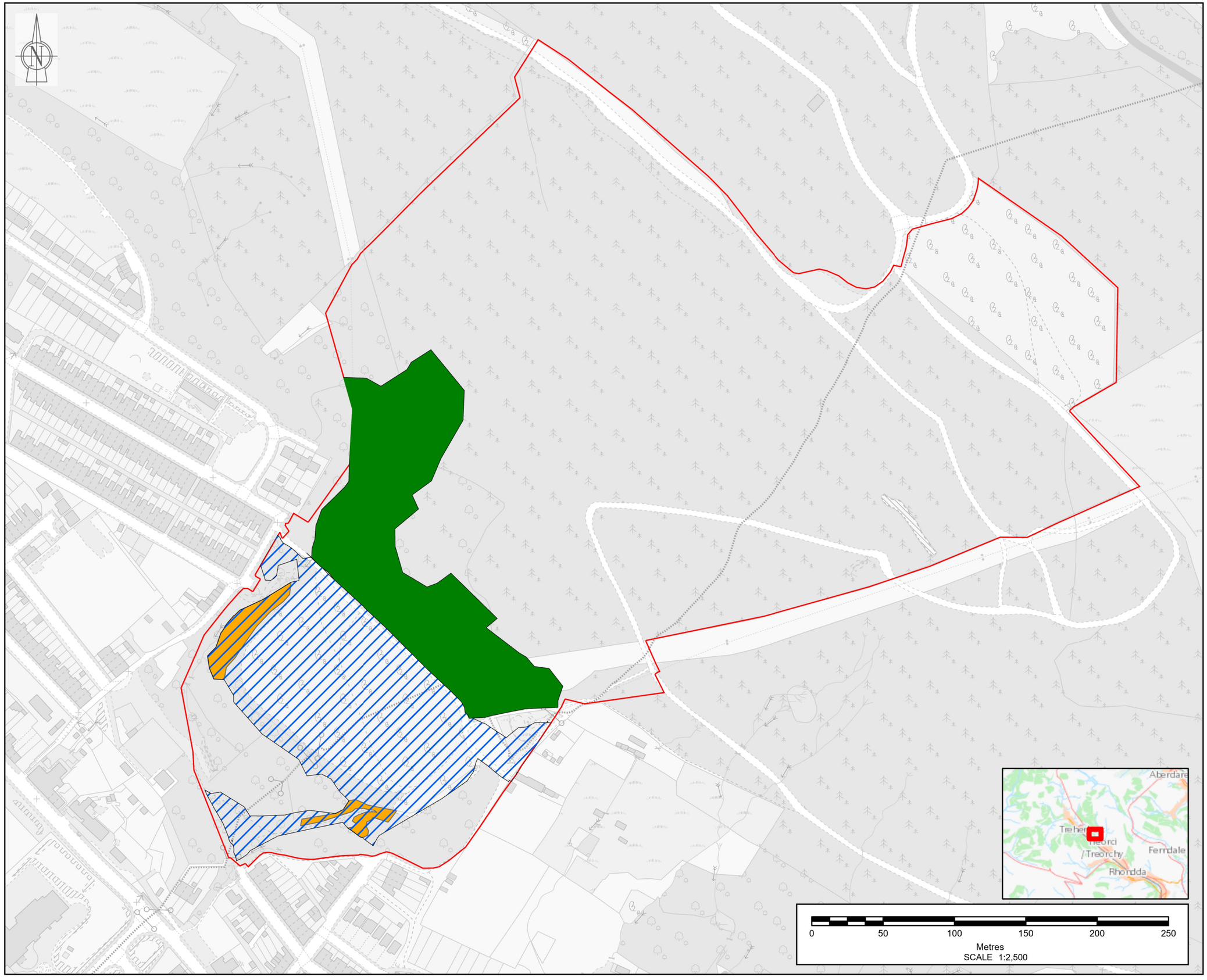
15	SS947599 7794	Montbretia along edge of path near houses.	
16	SS947449 7885	5 southern marsh orchids.	

17	SS947509 8117	Ivy leaved bell flower growing on edge of water run off channel from hillside.	

18	SS947519 8102	Pool on edge of woodland with *Sphagnum cuspidatum* growing throughout.	

Appendix C: Habitats of Principal Importance Map

Drawing no. 4021525-BUK-ZZ-DR-EN-00011



Note: The limits, including the height and depths of the Works, shown in this drawing are not to be taken as limiting the obligations of the contractor under Contract.

LEGEND

- PHASE ONE HABITAT SURVEY AREA
- LOWLAND ACIDIC GRASSLAND
- OPEN MOSAIC HABITAT
- WET WOODLAND

SAFETY HEALTH AND ENVIRONMENT INFORMATION
IN ADDITION TO THE HAZARDS OR RISKS NORMALLY ASSOCIATED WITH THE TYPES OF WORK DETAILED ON THIS DRAWING, THE FOLLOWING SIGNIFICANT RESIDUAL RISKS SHOULD BE NOTED. FURTHER DETAILS ARE INCLUDED IN THE CDM DESIGN RISK MANAGEMENT REGISTER
CONSTRUCTION
N/A
MAINTENANCE / CLEARING / OPERATION
N/A
DECOMMISSIONING / DEMOLITION
N/A

Rev	Drawn	Chkd	Rvwd	Apprvd	Date	Description
P01	AP	AB	ES	AH	27/11/2024	FOR INFORMATION

Designed by: JR

Date: NOVEMBER 2024

Client

Cyfoeth Naturiol Cymru Natural Resources Wales

Client Drawing No.

Revision

Binnies UK Limited
Registered Office:
Spring Lodge, 172 Chester Road, Helsby, Cheshire, WA6 0AR UK
Tel: +44(0)1737 774155

Project:

PEN YR ENGLYN

Drawing title:

HABITATS OF PRINCIPAL IMPORTANCE

Drawing scale: 1:2,500

Sheet size: A3

Drawing no.: 4021526-BUK-ZZ-00-DR-EN-00011

Revision: P01

Print Version: Print Quality (300dpi @ A3)

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