
Convatec Green Manufacturing Hub

Appendix 11.1: Habitats and Vegetation



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1 INTRODUCTION

- 1.1.1 This Appendix has been prepared to accompany **Chapter 11: Ecology** of the Convatec Green Manufacturing Hub (the 'Proposed Development') Environmental Statement (ES).
- 1.1.2 It presents detailed methodologies and results of desk study and field surveys completed to establish baseline habitat conditions to inform the design and assessment of the Proposed Development.
- 1.1.3 The objectives of the baseline studies were to:
- Establish the spatial distribution of habitats and vegetation communities which may be impacted by the Proposed Development;
 - Identify the presence and distribution of any habitat types listed on Annex 1 of the Habitats Directive¹, Environment (Wales) Act 2016 Section 7², and/or which represent potential Groundwater Dependent Terrestrial Ecosystems (GWDTEs) for subsequent hydrological assessment; and,
 - Record the presence of any protected or non-native plant species listed on Schedule 8 and 9 of the Wildlife and Countryside Act 1981 (as amended) respectively.
- 1.1.4 It should be read with reference to the following figures presented in **Volume xx** of the ES:
- **Figure 11.1a:** Ecological Statutory Designated Sites;
 - **Figure 11.1b:** Ecological Non-statutory Designated Sites;
 - **Figure 11.2 (b-c):** Existing Ecological Records (Non-Sensitive);
 - **Figure 11.3:** Phase 1 Habitat Survey Plan; and,
 - **Figure 11.4:** NVC Survey Plan.
- 1.1.5 Only common species names are used throughout this appendix. Scientific names for all species referenced are supplied in **Annex 1**. The only exception is where species are stated in the name of NVC communities.

2 METHODOLOGY

2.1 Desk Study and Consultation

- 2.1.1 A desk study was undertaken to identify the proximity of the Site to any statutory or non-statutory designated site for nature conservation with habitat or botanical qualifying interest, and to obtain any existing records of protected and/or non-native flora within the Site and the surrounding wider area.

¹ Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora.

² Welsh Government (2016) *Environment (Wales) Act 2016 Section 7 – list of the habitats of principal importance for the purpose of maintaining and enhancing biodiversity in relation to Wales*. Available online: <https://www.biodiversitywales.org.uk/Section-7>. (Accessed 29/01/2024).

2.1.2 Details of all consultation undertaken in relation to ecology is presented in **Table XX** of **Chapter 11: 'Ecology'** in **Volume xx** of the ES.

Table 2.1: Desk study key sources and information sought.

| Key Source | Date of Consultation | Information Sought | Study Area |
|--|----------------------|---|--|
| Natural Resources Wales website https://naturalresources.wales/?lang=en | December 2023 | Proximity to statutory designated sites. | Within 10km of the Site (see Figure 11.1a). |
| 'MAGIC' website https://magic.defra.gov.uk/magicmap.aspx | December 2023 | Proximity to statutory designated sites. | Within 10km of the Site (see Figure 11.1a). |
| South East Wales Biodiversity Record Centre (SEWBReC) | December 2023 | Existing records of protected and notable habitats and plant species. Proximity to non-statutory designated sites. | Within 2km of the Site (see Figures 11.1b, 11.2b and 11.2c). |

2.2 Field Surveys

2.2.1 The following habitat field surveys were completed:

- Phase 1 habitat survey; and,
- National Vegetation Classification (NVC) survey.

Phase 1 Habitat Survey

2.2.2 A phase 1 habitat survey was undertaken on 28th to 31st August 2023, in accordance with the Joint Nature Conservation Committee guidance (JNCC, 2010³). The survey area included all land within the Site, and also habitats extended to 100m from the infrastructure and 250m from turbines.

2.2.3 Habitat types were identified based on the vegetation (plant species identity and structure), as well as the observable hydrology and topography of the Site.

³ Joint Nature Conservation Committee. (2010) *Handbook for Phase 1 habitat survey – a technique for environmental audit*. JNCC, Peterborough, ISBN 0 86139 636 7.

- 2.2.4 The survey was extended to also record signs of the presence, or potential presence, of protected species (e.g. mammals) including the presence of habitat types that might provide suitable breeding or refuge areas⁴.

NVC Survey

- 2.2.5 A NVC survey was undertaken on 28th to 31st August 2023, in accordance with guidance (Rodwell, 2006⁵). The survey concentrated on those areas where plant communities were deemed likely to form Annex 1 habitats and / or represent GWDTEs.
- 2.2.6 In the survey, 2m² quadrats were distributed throughout homogenous stands in order to provide a representative sample of each vegetation community that was present.
- 2.2.7 In each quadrat, data were collected on the presence and abundance of plant species using the Domin scale. These data were then analysed and classified to an NVC vegetation community using the keys in *British Plant Communities* (JNCC, 1991⁶ and 1992⁷) and MAVIS Plot Analyser (2016⁸) for guidance.

Personnel

- 2.2.8 Surveys were conducted by C. Davis; a competent botanist with experience of undertaking Phase 1 Habitat and NVC surveys across numerous comparable sites in Britain, including Wales.
- 2.2.9 The NVC analysis was checked by C. Dean; a competent botanist with experience of undertaking and analysing NVC survey data.

Limitations

- 2.2.10 No limitations were encountered during the habitat surveys or in relation to the analysis of habitat survey data.

3 RESULTS

3.1 Desk Study

- 3.1.1 This section provides details of existing ecological information and existing records of protected, notable and invasive flora identified within and in proximity to the Site from desk study sources listed in **Table 2.1**.

Statutory Designated Sites for Nature Conservation

- 3.1.2 This section should be read with reference to **Figure 11.1a**⁹.

⁴ Note the results related to protected species are considered in **Appendix 11.2 Protected Species**.

⁵ Rodwell, J.S. (2006) *National Vegetation Community Users' Handbook*. JNCC, Peterborough, ISBN 978 1 86107 574 1.

⁶ Joint Nature Conservation Committee (1991) *British Plant Communities* ed. J.S. Rodwell. Volume 2. *Mires and Heaths*. Cambridge University Press, Cambridge, ISBN 978-0-521-62720-7.

⁷ Joint Nature Conservation Committee (1992) *British Plant Communities* ed. J.S. Rodwell. Volume 3. *Grasslands and Montane Communities*. Cambridge University Press, Cambridge, ISBN 978-0-521-62719-1.

⁸ <https://www.ceh.ac.uk/services/modular-analysis-vegetation-information-system-mavis> (Accessed 25/01/2024).

⁹ Note, some designated sites on **Figure 11.1a** have other ecology, but no habitat and botanical qualifying interest.

- 3.1.3 A review of the 'MAGIC' and NRW websites identifies that the Site does not form part of any statutory designated site for nature conservation with qualifying ecological qualifying features.
- 3.1.4 Twenty-one statutory designated sites with qualifying habitat and/or botanical interest are located within 10km of the Site (see **Table 3.1**).

Table 3.1: Statutory designated sites for nature conservation.

SAC – Special Area of Conservation; SSSI – Site of Special Scientific Interest; LNR – Local Nature Reserve.

| Designated Site | Distance and Direction from the Site | Botanical and/or Habitat Qualifying Features |
|---|--------------------------------------|---|
| International | | |
| Safleoedd Ystlumod Wysg (Usk Bat Sites) SAC | 7.99km, north-east | <ul style="list-style-type: none"> Blanket Bog; Mixed woodland on base-rich soils associated with rocky slopes; Plants in crevices in base-rich rocks; Caves not open to the public; Degraded raised bogs still capable of natural regeneration; and, Dry heaths. |
| National | | |
| Parc Bryn Bach LNR | 1.92km, north-east | <ul style="list-style-type: none"> 112ha of man-made habitats including a lake, plantation woodland and airstrip with some grazed land, with some habitats listed as priority habitats in UK and Local Biodiversity Action Plan (LBAPs). |
| Cwm Taf Fechan Woodlands SSSI | 3.9km, west | <ul style="list-style-type: none"> Mixed deciduous woodlands with limestone fern; and, Interesting plant communities in flushes around tufa springs and the splash zone of the river. |
| Cwmllydrew Meadows LNR | 4.06km, south | <ul style="list-style-type: none"> Wet meadows. |
| Sirhowy Hill Woodlands and Cardiff Pond LNR | 4.1km, east | <ul style="list-style-type: none"> Habitats, including woodland. |
| Cefn y Brithdir SSSI | 4.56km, south-east | <ul style="list-style-type: none"> Dwarf shrub heath community (with |

| Designated Site | Distance and Direction from the Site | Botanical and/or Habitat Qualifying Features |
|--|--------------------------------------|--|
| | | crowberry as a co-dominant). |
| Cwm Taf Fechan Woodlands LNR | 5.02km, west | <ul style="list-style-type: none"> Interest as above in relation to the SSSI. |
| Cwm Glo a Glyndyrys SSSI | 5.55km, south-west | <ul style="list-style-type: none"> Extensive areas of marshy grassland, species-rich neutral grassland and acid grassland, and for the association of these habitats with others including woodland and heath; and, Diverse assemblage of grassland fungi. |
| Beaufort Hills Pond and Woodland LNR | 6.92km, north-east | <ul style="list-style-type: none"> Pond and woodland habitat. |
| Parc Nant-y-Waun LNR | 7.57km, north-east | <ul style="list-style-type: none"> Pond and mix of broad-leaved trees. |
| Penmoelallt SSSI | 7.48km, west | <ul style="list-style-type: none"> A mixed woodland of ash, oak, wych elm and small-leaved lime overlying Carboniferous Limestone. The rare Ley's whitebeam grows on a small escarpment within the wood. |
| Daren Fach SSSI | 7.54km, north-west | <ul style="list-style-type: none"> Open scrub on low limestone cliffs with screes and woodland on the gentler slopes; and, Concentration of Ley's whitebeam and a specimen of rock whitebeam growing in association with ash, yew and holly. |
| Silent Valley LNR | 7.99km, south-east | <ul style="list-style-type: none"> Once a farm with meadows and an old coal pit, now beech woodland. |
| Mynydd Llangatwg (Mynydd Llangattock) SSSI | 7.99km, north-east | <ul style="list-style-type: none"> Base-rich grassland; Heather dominated blanket mire; |

| Designated Site | Distance and Direction from the Site | Botanical and/or Habitat Qualifying Features |
|--|--------------------------------------|---|
| | | <ul style="list-style-type: none"> • Dry heath; • Craggs, woodland, and grassland of the limestone escarpments; and, • Cave system. |
| Cwm Merddog Woodlands SSSI | 8.02km, south-east | <ul style="list-style-type: none"> • Beech woodland near the westerly limit of its geographical range; • Highest known station for beech in Britain; and, • Interesting transition zones between beech and alder dominated communities in areas of impeded drainage. |
| Trevor Rowson LNR | 8.7km, east | <ul style="list-style-type: none"> • Variety of habitats, including woodland, scrub and open water, on land reclaimed since its use for industry and the construction of a school. |
| Caeau Nant y Groes SSSI | 8.7km, south-west | <ul style="list-style-type: none"> • Species-rich neutral grassland. |
| Bryncarnau Grasslands, Llwydcoed SSSI | 9.42km, west | <ul style="list-style-type: none"> • Mosaic of lowland grassland types; and, • Unusual plants, including greater butterfly-orchid, wood bitter-vetch and pale sedge. |
| Cwmcelyn Ponds LNR | 9.73km, east | <ul style="list-style-type: none"> • Range of habitats, including open water, grassland, scrub, heath and woodland. |
| Aberbargoed Grasslands/ Glaswelltiroedd Aberbargoed SSSI | 9.82km, south | <ul style="list-style-type: none"> • Fen meadow; • Mesotrophic (neutral) grassland; and, • Range of associated other semi-natural habitats. |
| Roseheyworth Woodlands LNR | 9.94km, east | <ul style="list-style-type: none"> • Range of habitats, including woodland, heath and mire with areas of open water. |

Non-statutory Designated Sites for Nature Conservation

- 3.1.5 This section should be read with reference to **Figure 11.1b**.
- 3.1.6 The records provided by SEWBRc indicated that there are six non-designated sites for nature conservation within 2km of the Site (see **Table 3.2**). The records also report that the Site is located as part of a Buglife 'B-Line'¹⁰; a route selected for a wildlife corridor restoration project.

Table 3.2: Non-statutory designated sites for nature conservation.

| Designated Site | Distance and Direction from the Site | Description |
|---|---|--|
| Cefn Gelligaer SINC | Adjoins, southern Site boundary | Extensive upland area of acid grassland, semi-improved acid grassland, marshy grassland and wet heath, and associated mosaics. |
| River Rhymney SINC | 160m, east | Full length of River Rhymney which is a significant linear wildlife corridor. River corridor includes the river, riverbanks, and adjacent semi-natural habitat, including woodland, wetland, hedgerows and species-rich grassland. |
| Butetown, Llechryd and Rhymney Grasslands, Rhymney SINC | 295m, north | Several small pieces of land supporting marshy grassland and semi-improved acid (and neutral) grassland, with a number of corresponding indicator species. |
| Pan March and Traed y Milwyr, Llechryd SINC | 500m, north | An extensive upland area supporting a mix of wet and dry acid grassland and heath. |
| Tair Carreg Moor, north west of Fochriw SINC | 980m, south-west | Majority of extensive upland area supports a mosaic of wet and dry acid grassland and heath. Locally significant dragonfly population. |
| Merthyr Common, North SINC | 1.3km, north-west | Very extensive area of upland common land supporting a mosaic of both wet and dry moorland habitats, including unimproved acid grassland, marshy grassland, dry heath, wet heath, acid flush and scree. |

Priority Habitats

- 3.1.7 The SEWBRc data search listed 13 records of habitats within 2km of the Site that may be included under Section 7 of the Environment Act (Wales) 2016 as 'habitats of principal importance for the purpose of maintaining and enhancing biodiversity' (see **Table 3.3**).

¹⁰ Buglife (2024). *B-Lines*. Available online: <https://www.buglife.org.uk/our-work/b-lines/> (Accessed 29/01/2024).

Table 3.3. Habitat records and potentially corresponding Section 7 categories.

| Habitat type | Potential Section 7 Status |
|---|--|
| D6 Basic dry heath/calcareous grassland mosaic | Calcareous grassland |
| D2 Wet heath | Heathland |
| D1.1 Dry acid heath | Heathland |
| I1.2.1 Acid/neutral scree | Inland rock outcrop and scree habitats |
| A1.1.1 Semi-natural broad-leaved woodland | Lowland mixed deciduous woodland |
| A1.1.1 Ancient semi-natural woodland | Lowland mixed deciduous woodland |
| G1 Standing water | Ponds / lakes |
| B5.2 Marshy grassland, <i>Molinia</i> dominated | Purple moorgrass and rush pastures |
| B5 Marshy grassland | Purple moorgrass and rush pastures |
| G2 Running water | Rivers |
| E2.1 Acid/neutral flush | Upland flushes, fens, and swamps |
| F2.2 Inundation vegetation | Upland flushes, fens, and swamps |
| F1 Swamp | Upland flushes, fens, and swamps |

Existing Botanical Records

- 3.1.8 This section should be read with reference to **Figure 11.2b** for protected and notable species, and **Figure 11.c** for invasive (Schedule 9) species.
- 3.1.9 **Protected species:** The SEWBRc data returned seven records of protected species found within 2km of the Site. Five of these records were for bluebell, which is a species with special protected status under Schedule 8 of the Wildlife & Countryside Act 1981. Also listed were two species of fungi (date date waxcap, big blue pinkgill) which are listed on Section 7 of the Environment (Wales) Act 2016.
- 3.1.10 **Notable species:** The data also returned 24 species, with 37 individual records, of plants which are included within Local Biodiversity Plan(s) or are listed as ‘vulnerable’ or ‘scarce’ based in IUCN Red Data Book guidelines.
- 3.1.11 **Non-native invasive species:** The data returned 51 records of non-native plant species within 2km of the Site, covering 16 different species. Of these, eight species are considered invasive and included under Schedule 9 – part II of the Wildlife & Countryside Act 1981: Canadian waterweed, wall cotoneaster, giant hogweed, Himalayan balsam, Japanese knotweed, Japanese rose, montbretia and New Zealand pygmyweed. Schedule 9 means that these species have already established in the wild in Great Britain and pose a continuing conservation threat to native biodiversity and habitats.

3.2 Field Surveys

- 3.2.1 The overwhelming majority of habitats across the Site, and in the surrounding area, are neutral grassland, with some limited acid influence. The ground is typically quite wet, and so in some areas the habitat transitions to marshy grassland. There are stretches of hedgerow separating some of the more intensively grazed pastures, and also some narrow strips of broad-leaved and mixed woodland in the north-west and east of the Site.

3.2.2 Maps of the Site (see **Figures 11.3** and **11.4**) show the distribution of the habitats and communities described below. Phase 1 Target Notes are detailed in **Annex 2**, full NVC survey data are presented in **Annex 3**, and corresponding survey photographs are presented in **Annex 4**.

3.3 Key Habitats

3.3.1 A1 Woodland:

- There are two, small patches of broad-leaved semi-natural woodland, with one in the north-west corner of the Site, and the other, outside the Site, adjacent to the north-east corner of the Site. In the north-east woodland block, the tree layer is predominantly composed of rowan, ash, and hawthorn, with an understorey of grasses and grassland forbs including cock's-foot, creeping thistle, common sorrel, tormentil, and devil's-bit scabious. In the north-west block, the tree layer is composed of goat willow, ash, and hawthorn, with an understorey of bramble, nettle, and invasive Japanese knotweed. In both cases, the species that are present suggest that these areas of woodland are recently, or relatively, disturbed habitats.
- There are narrow strips of mixed plantation woodland along the eastern boundary of the Site, bordering an industrial estate access road. The tree layer here is composed of sycamore, Swedish whitebeam, Scots pine, rowan, osier willow, and hawthorn. There is an understorey of dog rose, bramble, creeping thistle, and nettle.

3.3.2 B2.2 Neutral grassland, semi-improved: This habitat covers most of the Site:

- MG6 *Lolium perenne-Cynosurus cristatus* grassland: Much of the grassland on the Site is heavily grazed, with crested dog's-tail, perennial ryegrass, and Yorkshire fog as constant grasses, and white clover, common mouse-ear, and lesser spearwort as constant forbs. Common and creeping bent are constant and abundant, which is less typical for this community type, but is perhaps due to proximity with the MG10a and M23b communities.
- MG10a *Holcus lanatus-Juncus effusus* rush pasture: A large area in the west of the Site has a strong resemblance to the MG10 NVC community type; with dominant tall rushes, and constant and abundant Yorkshire fog, creeping bent, and lesser spearwort. In this community the tall rushes are predominantly compact rush; this differs from the typical MG10 community, where soft rush dominates, but is a community variation that has also been recorded in other areas with similar conditions to Rhymney (Averis and Averis, 2020¹¹).

3.3.3 **B5 Marshy grassland:** In the east of the Site there is a small patch that fits most closely to M23b *Juncus effusus-Galium palustre* rush-pasture. Tall rushes dominate, and Yorkshire fog and marsh bedstraw are constant and abundant. There is occasional greater bird's-foot trefoil, soft rush, and other species typical of damp grasslands. As with the MG10 grassland described above, compact rush dominates the community at this Site instead of soft rush.

3.3.4 **F2.1 Marginal vegetation:** In the west of the Site there is a wet area which consists of a mosaic of swamp in amongst the MG10a grassland. This swamp community is closest to S19 *Eleocharis palustris* swamp and is overwhelmingly dominated by common spike-rush.

¹¹ Averis, B. and Averis, A. (2020) Plant communities found in surveys by Ben and Alison Averis but not described in the UK National Vegetation Classification. Available online: [http://www.benandalisonaveris.co.uk/wp/wp-content/uploads/2020/11/non-nvc_vegetation_types_found_by_ben_and_alison_averis_2020-06_version_with_image_resolution_reduced .pdf](http://www.benandalisonaveris.co.uk/wp/wp-content/uploads/2020/11/non-nvc_vegetation_types_found_by_ben_and_alison_averis_2020-06_version_with_image_resolution_reduced.pdf). (Accessed 26/01/2024).

3.3.5 **J2.1. Intact hedgerows:** Hedgerows split up fields on the Site and are largely composed of hawthorn.

3.4 Protected and Notable Habitats

3.4.1 **Table 3.4** shows the plant communities identified at the Site and any corresponding designations relating to habitat status and potential groundwater dependence.

Table 3.4. Summary of habitats on the Site, and corresponding relevant designations.

| NVC community | Phase 1 habitat | Principal Habitats Directive Annex I type/s | Section 7 habitats | Priority peatland status | Potential dependence on groundwater |
|--|---|---|--------------------|--------------------------|-------------------------------------|
| - | A1 Woodland | - | - | - | Low |
| MG6 <i>Lolium perenne</i> - <i>Cynosurus cristatus</i> grassland | B2.2 Neutral grassland, semi-improved | - | - | - | Low |
| MG10a <i>Holcus lanatus</i> - <i>Juncus effusus</i> rush pasture | B2.2 Neutral grassland, semi-improved | - | - | - | Moderate* |
| M23b <i>Juncus effusus</i> - <i>Galium palustre</i> rush-pasture | B5 Marshy grassland | - | - | - | High* |
| S19 <i>Eleocharis palustris</i> swamp | F2.1 Marginal vegetation | - | - | - | Low |
| - | J2.1 Intact hedgerow (native woody species) | - | Hedgerows | - | Low |

* As listed in Appendix 4 of SEPA (2014¹²) LUPS Guidance Note 31. The categorisation of GWDTEs is preliminary and is based on vegetation communities present, and therefore confirmed GWDTE categorisation is based on subsequent formal hydrological assessment. The surveyor noted that given the context of the Site, this is likely to be 'Low', but as a precaution, given the documented classification, which is typical for the NVC community, the MG10a NVC community is classified as 'Moderate' in **Table 3.4**.

3.5 Notable Species

3.5.1 Plants:

- The survey did not find any plant species that are listed under Schedule 8 of the Wildlife and Countryside Act 1981 (as amended).
- Japanese knotweed was found within broad-leaved woodland adjacent to the north-eastern Site boundary (also see **Annex 2 - Target Notes**). This species is listed on Schedule 9 of the Wildlife and Countryside Act 1981.

¹² Scottish Environment Protection Agency (2014) *Land Use Planning System SEPA Guidance Note 31: Guidance on Assessing the Impacts of Development Proposals on Groundwater Abstractions and Groundwater Dependent Terrestrial Ecosystems*.

ANNEXES

Annex 1 – Scientific Names

Table A1.1. The common and scientific names of botanical species included in this appendix.

| Common Name | Scientific Name |
|-----------------------------|----------------------------------|
| Aquatic plants | |
| Blanketweed | <i>Spirogyra</i> sp. |
| Canadian Waterweed | <i>Elodea canadensis</i> |
| Forbs | |
| American willowherb | <i>Epilobium ciliatum</i> |
| Autumn hawkbit | <i>Scorzoneroide autumnalis</i> |
| Bluebell | <i>Hyacinthoides non-scripta</i> |
| Bog stitchwort | <i>Linum catharticum</i> |
| Common mouse-ear | <i>Cerastium fontanum</i> |
| Common ragwort | <i>Jacobaea vulgaris</i> |
| Common sorrel | <i>Rumex acetosa</i> |
| Common stork's-bill | <i>Erodium cicutarium</i> |
| Creeping buttercup | <i>Ranunculus repens</i> |
| Creeping thistle | <i>Cirsium arvense</i> |
| Cuckoo flower | <i>Cardamine pratensis</i> |
| Daisy | <i>Bellis perennis</i> |
| Devil's-bit scabious | <i>Succisa pratensis</i> |
| Dove's-foot crane's-bill | <i>Geranium molle</i> |
| Eyebright | <i>Euphrasia</i> sp. |
| Giant Hogweed | <i>Heracleum mantegazzianum</i> |
| Greater bird's-foot trefoil | <i>Lotus pendunculatus</i> |
| Himalayan Balsam | <i>Impatiens glandulifera</i> |
| Japanese knotweed | <i>Fallopia japonica</i> |
| Lesser spearwort | <i>Ranunculus flammula</i> |
| Marsh bedstraw | <i>Galium palustre</i> |
| Marsh thistle | <i>Cirsium palustre</i> |
| Montbretia | <i>Crocsmia x crocosmiiflora</i> |
| Musk thistle | <i>Carduus nutans</i> |

| Common Name | Scientific Name |
|------------------------------------|------------------------------|
| Nettle | <i>Urtica dioica</i> |
| New Zealand Pigmyweed | <i>Crassula helmsii</i> |
| Red clover | <i>Trifolium pratense</i> |
| Ribwort plantain | <i>Plantago lanceolata</i> |
| Sheep's sorrel | <i>Rumex acetosella</i> |
| Tormentil | <i>Potentilla erecta</i> |
| Water forget-me-not | <i>Myosotis scorpioides</i> |
| White clover | <i>Trifolium repens</i> |
| Yarrow | <i>Achillea millefolium</i> |
| Grasses, sedges, and rushes | |
| Cock's-foot | <i>Dactylus glomerata</i> |
| Common bent | <i>Agrostis capillaris</i> |
| Common spike-rush | <i>Eleocharis palustris</i> |
| Compact rush | <i>Juncus conglomeratus</i> |
| Creeping bent | <i>Agrostis stolonifera</i> |
| Crested dog's-tail | <i>Cynosurus cristatus</i> |
| Floating sweet-grass | <i>Glyceria fluitans</i> |
| Jointed rush | <i>Juncus articulatus</i> |
| Perennial ryegrass | <i>Lolium perenne</i> |
| Red fescue | <i>Festuca rubra</i> |
| Rough meadow grass | <i>Poa trivialis</i> |
| Sharp-flowered rush | <i>Juncus acutiflorus</i> |
| Soft rush | <i>Juncus effusus</i> |
| Sweet vernal-grass | <i>Anthoxanthum odoratum</i> |
| Timothy | <i>Phleum pratense</i> |
| Tufted hair-grass | <i>Deschampsia cespitosa</i> |
| Velvet bent | <i>Agrostis canina</i> |
| Yorkshire fog | <i>Holcus lanatus</i> |
| Mosses, ferns, and lichens | |
| Broad-buckler fern | <i>Dryopteris dilatata</i> |

| Common Name | Scientific Name |
|----------------------|-----------------------------------|
| Limestone fern | <i>Gymnocarpium robertianum</i> |
| Male fern | <i>Dryopteris filix-mas</i> |
| Pointed spear-moss | <i>Calliergonella cuspidata</i> |
| Springy turf-moss | <i>Rhytidiadelphus squarrosus</i> |
| Broad-buckler fern | <i>Dryopteris dilatata</i> |
| Woody species | |
| Ash | <i>Fraxinus excelsior</i> |
| Bramble | <i>Rubus fruticosus</i> |
| Cotoneaster | <i>Cotoneaster</i> spp. |
| Crowberry | <i>Empetrum nigrum</i> |
| Dog rose | <i>Rosa canina</i> |
| Hawthorn | <i>Crataegus monogyna</i> |
| Japanese Rose | <i>Rosa rugosa</i> |
| Ley's whitebeam | <i>Sorbus leyana</i> |
| Osier willow | <i>Salix viminalis</i> |
| Rock whitebeam | <i>Sorbus rupicola</i> |
| Rowan | <i>Sorbus aucuparia</i> |
| Scots pine | <i>Pinus sylvestris</i> |
| Swedish whitebeam | <i>Scandosorbus intermedia</i> |
| Sycamore | <i>Acer pseudoplatanus</i> |
| Fungi | |
| Date waxcap | <i>Hygrocybe spadicea</i> |
| Big blue pinkgill | <i>Entoloma bloxamii</i> |

Annex 2 – Phase 1 Target Notes

Table A2.1. Target Notes relating to the Phase 1 habitat survey.

| Target Note | Grid reference | Description | Photo(s) |
|-------------|----------------|--|----------|
| 1 | SO 09697 08055 | Sheer banks and scree. Suspected old quarry. | 7 |
| 2 | SO 10033 08234 | Small midden pile overgrown with nettles. | 8 |
| 3 | SO 10443 08356 | Overgrown waterbody. 20m long, containing floating sweet-grass and thick blanket weed, with limited area of standing water. Marked on OS map as disused 'shaft'. | 9 |
| 4 | SO 10422 08690 | Japanese knotweed present in wooded area. | - |

Annex 3 – NVC Survey Full Results

Table A3.1. *The DOMIN scale; used to classify the abundance of plants in the NVC surveys.*

| DOMIN code | Approximate percentage cover in quadrat |
|------------|---|
| 10 | 91 - 100% |
| 9 | 76 – 90% |
| 8 | 51 – 75% |
| 7 | 34 – 50% |
| 6 | 26 – 33% |
| 5 | 11 – 25% |
| 4 | 4 – 10% |
| 3 | <4% many individuals |
| 2 | <4% a few individuals |
| 1 | <4% one or two individuals |

Tables A3.2 – A3.5. All data recorded in the NVC survey, with each table representing a specific NVC community. For each quadrat, a full plant species inventory is included in which the abundance of each species is represented using the DOMIN scale, as described above. ‘Const.’ refers to constancy which is the frequency which each plant species occurs across all quadrats within a specific NVC community and is ranked from 1 (least frequent) to 5 (most frequent).

Table A3.2.

| Phase 1 habitat type | B2.2 Neutral grassland, semi-improved | | | | | |
|----------------------------------|--|-------------------|-------------------|-------------------|-------------------|--------|
| NVC Community | MG10a <i>Holcus lanatus</i> - <i>Juncus effusus</i> rush pasture | | | | | |
| Quadrats | 6 | 7 | 8 | 9 | 10 | |
| OS grid co-ordinates | SO 09818 08285 | SO 09783 08277 | SO 09670 08221 | SO 09677 08203 | SO 09570 08141 | |
| Species | Cover (DOMIN) | | | | | Const. |
| <i>Agrostis canina</i> | | | 4 | | | 1 |
| <i>Agrostis capillaris</i> | 4 | 4 | 4 | | | 3 |
| <i>Agrostis stolonifera</i> | 6 | 6 | 6 | 6 | 6 | 5 |
| <i>Anthoxanthum odoratum</i> | 4 | 4 | 4 | 4 | 4 | 5 |
| <i>Cardamine pratensis</i> | 4 | 4 | | | | 2 |
| <i>Cerastium fontanum</i> | 4 | | 4 | 4 | 4 | 4 |
| <i>Cirsium arvense</i> | 4 | | | | | 1 |
| <i>Cirsium palustre</i> | 4 | | 4 | 4 | 4 | 4 |
| <i>Cynosurus cristatus</i> | 4 | | 4 | | | 2 |
| <i>Deschampsia cespitosa</i> | 4 | | 4 | | 4 | 3 |
| <i>Dryopteris filix-mas</i> | | | | 4 | | 1 |
| <i>Epilobium ciliatum</i> | | | | 4 | 4 | 2 |
| <i>Festuca rubra</i> | 4 | 4 | 4 | | 4 | 4 |
| <i>Holcus lanatus</i> | 7 | 7 | 7 | 7 | 7 | 5 |
| <i>Juncus conglomeratus</i> | 9 | 8 | 9 | 9 | 9 | 5 |
| <i>Juncus effusus</i> | 4 | | | | 4 | 2 |
| <i>Lolium perenne</i> | | | 4 | | | 1 |
| <i>Phleum pratense</i> | | 4 | | | | 1 |
| <i>Poa trivialis</i> | 4 | 5 | 5 | 5 | 4 | 5 |
| <i>Ranunculus repens</i> | 6 | 7 | 6 | 6 | 7 | 5 |
| <i>Rhytidadelphus squarrosus</i> | 6 | 4 | 4 | 5 | 6 | 5 |
| <i>Rumex acetosa</i> | 4 | 4 | | | 4 | 3 |
| <i>Trifolium pratense</i> | | 4 | | | | 1 |
| <i>Trifolium repens</i> | 6 | 7 | 6 | 6 | 7 | 5 |
| <i>Urtica dioica</i> | | | | 4 | | 1 |

Table A3.3

| Phase 1 habitat type | B2.2 Neutral grassland, semi-improved | | | | | |
|-----------------------------------|--|-------------------|-------------------|-------------------|-------------------|--------|
| NVC Community | MG6 <i>Lolium perenne</i> - <i>Cynosurus cristatus</i> grassland | | | | | |
| Quadrats | 21 | 22 | 23 | 24 | 25 | |
| OS grid co-ordinates | SO 10370 08241 | SO 10332 08240 | SO 10328 08181 | SO 09525 08502 | SO 09595 08483 | |
| Species | Cover (DOMIN) | | | | | Const. |
| <i>Achillea millefolium</i> | 4 | 4 | 5 | | | 3 |
| <i>Agrostis capillaris</i> | 7 | 7 | 7 | 7 | 7 | 5 |
| <i>Agrostis stolonifera</i> | 7 | 7 | 7 | 7 | 7 | 5 |
| <i>Anthoxanthum odoratum</i> | 4 | 4 | 4 | 5 | 5 | 5 |
| <i>Bellis perennis</i> | | | | 4 | 4 | 2 |
| <i>Cardamine pratensis</i> | | | | 4 | | 1 |
| <i>Carduus nutans</i> | 4 | | 4 | | | 2 |
| <i>Cerastium fontanum</i> | 4 | 4 | 5 | 4 | 4 | 5 |
| <i>Cynosurus cristatus</i> | 4 | 4 | 4 | 5 | 5 | 5 |
| <i>Erodium cicutarium</i> | 1 | | | | | 1 |
| <i>Euphrasia</i> sp. | | | | 1 | | 1 |
| <i>Festuca rubra</i> | 4 | | 4 | | 4 | 3 |
| <i>Geranium molle</i> | 4 | | 4 | | | 2 |
| <i>Holcus lanatus</i> | 5 | 5 | 5 | 5 | 5 | 5 |
| <i>Juncus conglomeratus</i> | 5 | 4 | | 4 | 4 | 4 |
| <i>Lolium perenne</i> | 6 | 6 | 5 | 6 | 5 | 5 |
| <i>Phleum pratense</i> | | 4 | | 4 | | 2 |
| <i>Plantago lanceolata</i> | 4 | 4 | 4 | | | 3 |
| <i>Ranunculus repens</i> | 6 | 5 | 7 | 6 | 6 | 5 |
| <i>Rhytidiadelphus squarrosus</i> | 4 | | 4 | 4 | 4 | 4 |
| <i>Rumex acetosella</i> | 5 | 4 | 4 | | | 3 |
| <i>Scorzoneroideis autumnalis</i> | 5 | 5 | 4 | 5 | 5 | 5 |
| <i>Trifolium pratense</i> | 4 | 4 | 4 | 5 | 5 | 5 |
| <i>Trifolium repens</i> | 7 | 6 | 6 | 6 | 6 | 5 |
| <i>Urtica dioica</i> | | | | | 4 | 1 |

Table A3.4

| Phase 1 habitat type | B5 Marshy grassland | | | | | | | | | | |
|---------------------------------|---|-----|-----|-----|-----|-----|-----|-----|-----|-----|--------|
| NVC Community | M23b <i>Juncus effusus/acutiflorus</i> - <i>Galium palustre</i> rush-pasture (<i>J. effusus</i> sub-community) | | | | | | | | | | |
| Quadrat | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | |
| OS grid co-ordinates | SO | SO | SO | SO | SO | SO | SO | SO | SO | SO | |
| | 103 | 103 | 103 | 103 | 103 | 104 | 104 | 104 | 104 | 104 | |
| | 74 | 76 | 78 | 72 | 75 | 50 | 60 | 58 | 70 | 73 | |
| | 083 | 083 | 083 | 083 | 083 | 083 | 083 | 083 | 083 | 083 | |
| | 76 | 72 | 63 | 53 | 50 | 44 | 44 | 34 | 31 | 29 | |
| Species | Cover (DOMIN) | | | | | | | | | | Const. |
| <i>Calliargonella cuspidata</i> | 7 | 7 | 7 | 6 | 7 | 4 | 4 | 5 | 5 | 5 | 5 |
| <i>Cardamine pratensis</i> | 4 | 4 | 4 | 4 | 4 | 4 | 4 | | 4 | 4 | 5 |
| <i>Cirsium palustre</i> | 4 | 4 | 4 | | 4 | | | 4 | 4 | | 3 |
| <i>Deschampsia cespitosa</i> | | | 4 | | | 4 | 4 | | | | 2 |
| <i>Dryopteris dilatata</i> | 4 | | 4 | | | | | | | | 1 |
| <i>Epilobium ciliatum</i> | 4 | 4 | 4 | 4 | 4 | | 4 | | 4 | | 4 |
| <i>Festuca rubra</i> | | 4 | | | 4 | | | | | | 1 |
| <i>Galium palustre</i> | 6 | 6 | 5 | 4 | 6 | | 4 | | 4 | 4 | 4 |
| <i>Glyceria fluitans</i> | | | | | | 4 | 4 | | 4 | | 2 |
| <i>Holcus lanatus</i> | 4 | 4 | 4 | 4 | | 4 | 4 | 4 | 4 | 4 | 5 |
| <i>Jacobaea vulgaris</i> | | | | | 4 | | | | | | 1 |
| <i>Juncus acutiflorus</i> | | | 7 | 4 | | 4 | | | 4 | 4 | 3 |
| <i>Juncus articulatus</i> | | | 4 | | | | | | | | 1 |
| <i>Juncus conglomeratus</i> | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 8 | 9 | 5 |
| <i>Juncus effusus</i> | 4 | 4 | 4 | | | | 4 | | | 4 | 3 |
| <i>Linum catharticum</i> | | 4 | | | | | | | | | 1 |
| <i>Lotus pedunculatus</i> | | | | | | 8 | 8 | 7 | 8 | | 2 |
| <i>Myosotis scorpioides</i> | | 4 | | 4 | | 4 | | | | 4 | 2 |
| <i>Plantago lanceolata</i> | | | | 4 | | | | | | | 1 |
| <i>Ranunculus flammula</i> | 4 | | 4 | | 4 | 4 | 4 | 4 | 4 | 4 | 4 |
| <i>Ranunculus repens</i> | 6 | 5 | | 5 | 5 | 4 | 4 | 4 | 4 | 4 | 5 |
| <i>Rumex acetosa</i> | 4 | | 4 | | | | | | | | 1 |
| <i>Urtica dioica</i> | | 4 | | | | | | 4 | | | 1 |

Table A3.5.

| | | | | | | |
|-----------------------------|---------------------------------------|-------------------|-------------------|-------------------|-------------------|---------------|
| Phase 1 habitat type | F2.1 Marginal habitats | | | | | |
| NVC Community | S19 <i>Eleocharis palustris</i> swamp | | | | | |
| Quadrats | 1 | 2 | 3 | 4 | 5 | |
| OS grid co-ordinates | SO 09549 08336 | SO 09577 08348 | SO 09592 08378 | SO 09523 08372 | SO 09479 08340 | |
| Species | Cover (DOMIN) | | | | | Const. |
| <i>Cardamine pratensis</i> | 4 | 4 | 2 | 4 | 4 | 5 |
| <i>Eleocharis palustris</i> | 9 | 9 | 9 | 9 | 9 | 5 |
| <i>Glyceria fluitans</i> | | | 4 | | | 1 |
| <i>Holcus lanatus</i> | 4 | 4 | 4 | | | 3 |
| <i>Juncus conglomeratus</i> | 4 | 4 | 4 | | | 3 |
| <i>Myosotis scorpioides</i> | 4 | | 3 | 4 | | 3 |
| <i>Ranunculus flammula</i> | 4 | 1 | 4 | 4 | 3 | 5 |
| <i>Ranunculus repens</i> | 5 | 4 | 4 | 5 | 4 | 5 |

Annex 4 – Photographs

| Phase 1 Habitat Survey Photographs | |
|---|--|
|  |  |
| Photo 1. Western end of the Site (marshy grassland). | Photo 2. Northern part of the Site (neutral grassland). |
|  |  |
| Photo 3. Southern part of the Site (neutral grassland). | Photo 4. Eastern end of the Site (neutral grassland). |
|  |  |
| Photo 5. A hedgerow separating pastures within the Site. | Photo 6. Semi-natural woodland in the north-west of the Site. |

Target Note Photographs



Photo 7. Target note 1 – suspected disused quarry.



Photo 8. Target note 2 – stand of nettles.



Photo 9. Target note 3 – overgrown disused shaft, with minimal standing water.

NVC Survey Photographs



Photo 10. MG6 *Lolium perenne*-*Cynosurus cristatus* grassland.



Photo 11. MG10a *Holcus lanatus*-*Juncus effusus* rush pasture.



Photo 12. M23b *Juncus effusus*-*Galium palustre* rush-pasture.



Photo 13. S19 *Eleocharis palustris* swamp.