

Prepared for Hygrove Aggregates Limited

CWM NANT LLEICI QUARRY, GELLIFOWY ROAD,
YNYSMEUDWY, PONTARDAWE,
NEATH PORT TALBOT SA8 4TU

ECOLOGICAL ASSESSMENT UPDATE

4th April 2023

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Celtic Wildflowers



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Cwm Nant Lleici Quarry Extension: Ecological Assessment Update

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CONTENTS

	Page
1. Introduction	5
2. Scope of Work	5
3. Baseline Information	6
4. Protected Fauna	9
5. Review Of Ecological Assessment & Scoping Opinions	12
6. Constraints and Opportunities	17
7. References	19
Figure 1 Phase 1 Habitat Plan	20
Figure 2 Designated Sites	21
Photographs	23
Appendix 1 Target Notes	37

Cwm Nant Lleici Quarry Extension: Ecological Assessment Update

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Cwm Nant Lleici Quarry Extension: Ecological Assessment Update

1. INTRODUCTION

- 1.1 This report provides a record of the ecological walkover survey undertaken by Celtic Wildflowers, supplementing and updating baseline-data gathered for the Cwm Nant Lleici Quarry site EIA undertaken by SLR (2006). This work was undertaken on behalf of Hygrove Aggregates Limited in support of the proposals for an extension of the quarry into 12.2ha of land south of the existing void. The existing quarry and extension areas are consented up to 2026 and this document is in support of an application to extend the consent for quarrying up to 2040.
- 1.2 The report updates the status of features originally surveyed in the period 2004 to 2006 (SLR, 2006) in the form of an extended Phase I Habitat Survey and scoping assessment for protected species. The report reassesses the potential ecological impacts of the proposed development on habitat features and provides scoping opinion on protected species. The report also identifies opportunities to directly contribute to the sustainable management of local natural resources in line with the objectives set out in the Environment (Wales) Act 2016 and the Well-being of Future Generations (Wales) Act 2015.

2. SCOPE OF WORK

- 2.1 A walkover survey of Cwm Nant Lleici Quarry, the associated land ownership around it and the quarry extension area was carried out on 6th March 2023 by Barry Stewart. The Site is located at OSGR SN730070, and the area covered by the survey is shown on figures 1 and 2. Whilst permission was not provided to walk the extension area during the survey visit, the fields were viewed from the quarry boundary with binoculars and the opportunity was taken to fly a drone and obtain high resolution images of the land to enable an habitat condition to be evaluated (see photos 18 to 23).

The Site lies on the east-facing side of the Gwrhyd ridge. Ground elevation ranges between 140m and 242m AOD, is situated within the catchment of the Afon Tawe and was accessed from Gellyfowy Road, which runs north from Ynysmeudwy. The underlying geology is that of the South Wales Coal Measures (Hughes Member - Sandstone. Sedimentary bedrock formed between 309.5 and 308 million years ago during the Carboniferous period), overlain in parts by Devensian Till. The nearest large residential area is Pontardawe, situated 2.5km south-west of the site. Land adjacent to the quarry site comprises grazed pastures and areas of woodland, scrub and Bracken slopes.

Cwm Nant Lleici Quarry Extension: Ecological Assessment Update

2.2 Vegetation

The vegetation types present within the Site were assessed by Barry Stewart using methodology based on that described in the Handbook for *Phase 1 habitat survey - a technique for environmental audit* (Joint Nature Conservation Committee, 2010). The results of the survey are presented at figure 2 and brief descriptions of each habitat type are given in section 3, below. Species lists were compiled in the form of target notes (TN) in order to describe each of the mapping units and/or features of interest. These lists are reproduced at appendix 1 but key and noteworthy species are detailed in the relevant sections of the report. The text below uses vernacular names for the vascular plants recorded during the surveys, the scientific names of which are given at appendix 1. It is standard practice to use italicized scientific names of lower plants, including bryophytes (mosses and liverworts), which are used preferentially in the main text, although vernacular names are also provided at appendix 1.

Searches were also carried out for the presence of Invasive Non-Native Species (INNS), including those listed on Schedule 9 of the Wildlife and Countryside Act 1981, principally Japanese Knotweed *Fallopia japonica*, Indian Balsam *Impatiens glandulifera* and Giant Hogweed *Heracleum mantegazzianum*, these being species known to be present in the local area.

3. BASELINE INFORMATION**3.1 Designated Sites****3.1.1 Protected Sites**

There are no Special Protection Areas (SPA) or Special Areas of Conservation (SAC) within a 2km buffer of the survey site. The closest SPA is Crymlyn Bog, which lies 10.6km to the south. The closest SAC is the Burry Inlet, which lies 18 km to the west of the site.

The Ownership boundary of the Site abuts three Sites of Special Scientific Interest (SSSI): Cefn Gwrhyd, Rhydyfro SSSI along its western boundary, Gwrhyd Meadows SSSI along its northern boundary and Coed Cwm Du, Cilmaengwyn along a small section of the eastern boundary. None of these SSSI boundaries come into direct contact with either the existing working quarry or the quarry extension.

The context of all protected sites is shown on figure 1.

3.1.2 County Wildlife Sites

Figure 1 shows the series of **Sites of Importance for Nature Conservation (SINCs)** that has been adopted by Neath Port Talbot CBC in its Unitary Development Plan, one of which mirrors

Cwm Nant Lleici Quarry Extension: Ecological Assessment Update

the eastern boundary of the Cefn Gwrhyd, Rhydyfro SSSI along the western boundary of the Site.

3.1.3 Designated Ancient Woodland

A small 1.15ha ancient woodland unit, identified on the Forestry Commission Ancient Woodland Inventory 2011, as shown on figure 1 lies within the ownership boundary on the east side of the working quarry. There are additional larger units connected to the eastern boundary of the site, which form linkage to the mosaic of woodland units within the local area.

3.2 Vegetation Survey Results

The total numbers of species of the main plant taxonomic divisions recorded during the survey are shown at Table 3.1 and lists of all records are at appendix 1. Note these totals are only indicative of the actual assemblage as they are compiled from a single out of season visit.

Table 3.1 Species totals for taxonomic groups recorded during the survey

Taxonomic group	Total species
Vascular plants	92
Bryophytes (mosses & liverworts)	58
Lichens	6

3.2.1 WOODLAND AND SCRUB

Only a small part of the study Site included stands of semi-natural broad-leaved woodland, as shown by **TN01** on figure 1. The principal canopy species were Downy Birch, Pedunculate Oak, Sycamore, including several mature trees with a diameter at breast height generally less than 1m. Ash, Hawthorn, Hazel and Rusty Willow were amongst the underscrub and the field layer in all woodland areas was heavily dominated by Bramble, which together with the steepness of the slope made access difficult for detailed inspection.

A notable feature on the woodland edge was the north-facing mossy cliff face at the quarry entrance. This damp and drippy cliff supported a strong population of *Amphidium mougeotii* together with frequent Atlantic Ivy, *Diplophyllum albicans* and *Fissidens taxifolius*. Among the lower plant assemblage were liverworts of local interest, such as *Jungermannia atrovirens* and *Mesoptychia badensis*, both indicators of base enrichment.

Stands of scrub, mostly Downy Birch and Gorse were a feature of the quarry and its surrounds, with other species noted in lesser quantities such as Butterfly-bush, Pedunculate Oak, Rowan, Rusty Willow.

3.2.2 HEDGEROWS

Cwm Nant Lleici Quarry Extension: Ecological Assessment Update

A total of 462m of hedgerow lie within the extension area. The principal canopy species noted were Downy Birch and Pedunculate Oak, with occasional Ash, Blackthorn, Common Alder, Gorse, Hawthorn, Hazel, Rowan, Rusty Willow and Silver Birch. The field layer generally included dense stands of Bracken and Bramble, together with a variable mix of heathland and woodland species such as Atlantic Ivy, Broad Buckler-fern, Common Bent, Foxglove, Heather, Lady-fern, *Pseudoscleropodium purum* and Slender St John's-wort.

3.2.3 GRASSLAND

The large field in the south of the Site, marked **F1** on figure 2, was found to largely comprise improved grassland and at the time of the survey had been subjected to muck spreading. Access restrictions meant the field could only be viewed from the fence line, but the principal components there were evident included *Brachythecium rutabulum*, Cock's-foot, Common Bent, Common Sorrel, Creeping Buttercup, Dandelion, Yorkshire-fog and White Clover.

The fields shown by **F2** on figure 2, again could only be viewed from the margins, but appeared to display a more diverse assemblage than the heavily fertilised F1 field. The primary components seemed similar, but additional species noted through binoculars included Common Knapweed, Compact Rush, Marsh Thistle, Red Clover and Sweet Vernal-grass.

3.2.4 RUSH-PASTURE, RUNNELS & FLUSHED GROUND

The SLR (2006) report makes reference to a few runnels and rush pasture vegetation along the southern boundary of F1. These were not inspected during this survey because of access restrictions. This is potentially a key feature of interest.

3.2.5 OTHER FEATURES

The eastern side of F1 was largely dominated by Bracken and tall herbs with scrub dropping down into a woodland fringe, creating a well-structured habitat transition. Otherwise the only other features were a dirt track and a small stand of Gorse scrub.

3.2.6 QUARRY

Much of the quarry was devoid of any vegetation, but areas left undisturbed for some time supported different levels of colonisation by a relatively diverse number of species associated with early successional phases of recolonisation of gravel and silty substrates. The main vegetation types recorded were bryophyte crusts, frequently with a mix of low annuals and perennials. In some areas mixed stands of Birch, Bramble and Gorse-dominated scrub were prominent. Species characterising the vegetation of short bryophyte-rich vegetation were *Bryum dichotomum*, *Pogonatum urnigerum* and *Streblotrichum convolutum* var. *convolutum*, with species of local interest noted including *Bryoerythrophyllum ferruginascens*, *Dicranella howei*, *Didymodon ferrugineus* and Thyme-leaved Speedwell, several of these species indicative of base enrichment.

3.2.7 SIGNIFICANT PLANT SPECIES

Whilst the quarry area supports a moderate diversity of species, including several of local interest on the wet cliff face by the quarry entrance, no protected or nationally notable species were recorded.

4 PROTECTED FAUNA SCOPING

4.1 Protected birds and bird species of significance

Protected Birds

No fully protected species (i.e. those included under Schedule 1 of the Wildlife and Countryside Act, 1981) are known or suspected of breeding within the application site, though Barn Owl *Tyto alba*, Peregrine *Falco peregrinus* and Red Kite *Milvus milvus* have been recorded locally and could visit the site on occasions to hunt.

Other significant Birds

Section 7 'a', and/or Birds of Conservation Concern Red List 'b' Species, either recorded or likely to occur on site, include:

- ^a Cuckoo *Cuculus canorus* (possible breeder)
- ^{ab} Skylark *Alauda arvensis* (possible breeder in meadows)
- ^{ab} Song Thrush *Turdus philomelos* (possible breeder in boundary woodland and scrub)
- ^b Mistle Thrush *T. viscivorus* (likely breeder in adjacent woodland)
- ^a Dunnock *Prunella modularis* (possible breeder in hedgerows and boundary scrub)
- ^{ab} Linnet *Carduelis cannabina* (possible breeder in quarry scrub and hedgerows)

The breeding and non-breeding bird assemblage is considered as likely to be of minor significance, though it essential scrub is not cleared during the breeding season without prior inspection by a suitably qualified person. Ideally scrub clearance should be undertaken during the period September to February.

4.2 Bats

All British bats, and their roosts (occupied or not) are protected by i) The Conservation of Habitats and Species Regulations 2010. This legislation implements the EC Habitats and Species Directive in the UK, and ii) the Wildlife and Countryside Act Schedule 5 (as amended by the Countryside and Rights of Way Act 2000).

Developments which compromise the protection afforded to a European Protected Species require a licence from Natural Resources Wales, as stipulated in the Habitats and Species Regulations. The granting of a licence will be conditional on

- i) an agreed "works methodology", designed to minimise impact on the bat(s),
- ii) agreed "mitigation", to ensure the provision of alternative roost potential at/near the development.

Where planning permission is sought, the Local Planning Authority will need to know, at application stage, what methodology/mitigation is being proposed: this is to

- i) avoid changes in planning designs, post planning permission,
- ii) ensure that LPAs comply with regulation 3(4) of the Habitats Regulations, and
- iii) allow Natural Resources Wales to properly advise the Local Planning Authority.

These protections can be summarised as

- prohibiting the taking, killing or injuring of a bat,
- damaging or destroying a roost (occupied or not),
- obstructing access to a roost; and
- disturbing in-roost bats.

The Environment (Wales) Act 2016 requires all public authorities/bodies to have regard for the conservation of biodiversity e.g. when considering planning applications. There is a particular requirement to address those species and habitats targeted by the UK Biodiversity Action Plan, in pursuance of which the Welsh Government have listed Common and Soprano Pipistrelles, Noctule, Brown Long-eared, Greater and Lesser Horseshoe, Barbastelle and Bechstein bats at Section 7 of the Act as *Species of Principal Importance for Conservation of Biological Diversity*. Implementation of this responsibility varies across authorities but, typically, some LPAs ask for "bat accommodation" as a routine requirement, and some require survey data to be passed to a Local Records Office.

A number of semi-mature oak and birch will be removed from the hedgerows around **F2** and on the lower slope in the north-east of **F1**, as illustrated on figure 2. A check for potential opportunities for roosting bats will need to be undertaken before these features are cleared. It is likely that the woodland and hedgerow features at the site are used by travelling and foraging bats, so it is essential connectivity corridors are maintained and enhanced around the quarry by way of retaining and planting replacement hedgerows. The results of the bat roost potential survey will inform if further mitigation is required.

4.3 Reptiles

Six native reptile species occur in Britain: the Adder *Vipera berus*, the Grass Snake *Natrix natrix*, the Smooth Snake *Coronella austriaca*, the Sand Lizard *Lacerta agilis*, Common Lizard *Lacerta vivipara* and the Slow-worm *Anguis fragilis*.

Cwm Nant Lleici Quarry Extension: Ecological Assessment Update

The Smooth Snake is not found in Wales and Sand Lizard is restricted to recent reintroduction sites.

Grass Snakes are most commonly associated with wet habitats and frequently feed on aquatic animals such as frogs.

The Adder and Slow-worm are typically associated with drier, heathland habitat and the Common Lizard is found in a wide range of habitats.

All these species are cold blooded, and need to bask in sunlight. Such basking opportunities are readily found on south-facing slopes, and habitats such as free-draining railway embankments and old quarry workings are characteristically good sites.

Schedule 5 of the Wildlife & Countryside Act 1981 provides varying levels of protection for these species. The Smooth Snake and Sand Lizard are afforded complete protection under schedule 5 of the Act. The other four species are protected in respect of killing, injuring and sale.

The Sand Lizard is a UK Biodiversity Action Plan Priority Species, and on the basis of historical records and current re-introduction experiments it is also included as a *Species of Principal Importance for Conservation of Biological Diversity* in Wales under section 7 of the Environment (Wales) Act 2016.

The field vegetation at the Study Site is largely dominated by heavily grazed, improved and poor semi-improved grassland types that are generally unsuitable for reptiles. The southern marshy grassland and eastern Bracken slope sections of F1 have some reptile potential and should be assessed well in advance of the quarry operations proceeding.

4.4 Other Protected and Significant Fauna

Evidence of Water Vole *Arvicola terrestris* has been recorded in the marshy grassland at the southern limit of F1 (SLR, 2006) and further investigations will be required to update the status of the species there. Feeding signs of Badger *Meles meles* were noted in the fields during the current survey, but no evidence of setts was recorded. Again, the status of this species will need updating well in advance of quarrying operations proceeding in the extension area. The site does not support suitable habitat for other protected species or *Species of Principal Importance for Conservation of Biological Diversity* in Wales under Section 7 of the Environment (Wales) Act 2016 or UK Biodiversity Action Plan Priority Species, such as Otter *Lutra lutra*, Brown Hare *Lepus europaeus*, Dormouse *Muscardinus avellanarius*, amphibians and Marsh Fritillary butterfly *Eurodryas aurinia*.

5 REVIEW OF ECOLOGICAL ASSESSMENT & SCOPING OPINION

5.1. Assessment criteria

Impact significance has been assessed for each of the features using a three-stage process: An assessment of ecological value; an assessment of the magnitude of the likely impacts of the proposals; and a determination of impact significance based on a combination of ecological value and magnitude of impact.

Ecological Value

Each feature has been classified according to its nature conservation value using the examples provided in Table 5.1.

Table 5.1. Assessment of Ecological Value

Value	Examples
International	Internationally designated or proposed sites such as Ramsar Sites, Special Protection Areas, Biosphere Reserves and Special Areas of Conservation, or otherwise meeting criteria for international designation. Sites supporting populations of internationally important species.
National	Nationally designated sites such as Sites of Special Scientific Interest (SSSIs), or non-designated sites meeting SSSI selection criteria, National Nature Reserves (NNRs), Nature Conservancy Review (NCR) Grade 1 sites, viable areas of key habitats within the UK Biodiversity Action Plan. Sites supporting viable breeding populations of Red Data Book (RDB) species (excluding scarce species), or supplying critical elements of their habitat requirements.
Regional	Sites containing viable areas of threatened habitats listed in a regional Biodiversity Action Plan, comfortably exceeding Site of Importance for Nature Conservation (SINC) criteria, but not meeting SSSI selection criteria. Sites supporting viable populations of Nationally Scarce species or those included in the Regional Biodiversity Action Plan on account of their rarity, or supplying critical elements of their habitat requirements.
County	Sites meeting the criteria for a county or metropolitan area designation (such as SINC), which may include amenity and educational criteria in urban areas. Ancient semi-natural woodland. Designated Local Nature Reserves. Sites containing viable areas of any key habitat type identified in the Local Biodiversity Action Plan (LBAP). Sites supporting viable breeding populations of species known to be county/metropolitan rarities e.g. featuring in county 'red data book' or LBAP, or supplying critical elements of their habitat requirements.
District	Undesignated sites, or features considered appreciably to enrich the habitat resource within the context of the Borough or District, or included in the Borough or District LBAP. Amenity and educational functions will be recognised in urban areas. Sites with viable breeding populations of species listed as rare in the District or Borough LBAP or supplying critical elements of their habitat requirements.

Cwm Nant Lleici Quarry Extension: Ecological Assessment Update

Local	Undesignated sites, or features appreciably enriching the habitat resource within the context of the Parish or neighbourhood (e.g. a species-rich hedgerow).
Unimportant	Low-grade and widespread habitats

Magnitude of Impact

The magnitude of each predicted impact has been assessed on a scale of High, Medium, Low and Minimal according to the criteria provided in Table 5.2.

Table 5.2. Criteria for determining magnitude of impacts

Magnitude	Criteria
High	Loss of about 50% or more of the site area. Other effects (e.g. disturbance or damage arising from pollution) including indirect impacts having an adverse impact equivalent in nature conservation terms to a loss of >50% of the site area.
Medium	Loss affecting 20-49% of the site area. Other effects (e.g. disturbance or damage arising from pollution) including indirect impacts having an adverse impact equivalent in nature conservation terms to a loss of 20-49% of the site area.
Low	Loss affecting 4-19% of the site area. Other effects (e.g. disturbance or damage arising from pollution) including indirect impacts having an adverse impact equivalent in nature conservation terms to a loss of 4-19% of the site area.
Minimal	Loss affecting up to 4% of the site area. Other effects (e.g. disturbance or damage arising from pollution) including indirect impacts having an adverse impact equivalent in nature conservation terms to a loss of 4% of the site area.
Potential Net Gain	Mitigation will seek to increase the extent of existing habitats or replace lost habitats with larger areas of suitable habitats. Such areas will be established and, where significant species are to be displaced, will be in a state ready for colonisation prior to any proposed habitat disturbance.

Significance of Impact

Table 5.3. illustrates how significance has been assigned to the impact, based on a combination of the value of the feature being assessed. This has been expressed on a five-point scale ranging from Severe to Negligible as shown below.

Table 5.3. Criteria for determining significance of impacts

Impact Magnitude	Ecological Value						
	Inter-national	National	Regional	County	District	Local	Un-important
High	Severe	Major	Major	Major	Moderate	Minor	Minor

Cwm Nant Lleici Quarry Extension: Ecological Assessment Update

Medium	Major	Major	Moderate	Moderate	Moderate	Minor	Negligible
Low	Moderate	Moderate	Minor	Minor	Minor	Negligible	Negligible
Minimal	Minor	Minor	Negligible	Negligible	Negligible	Negligible	Negligible
No Impact	No Impact	No Impact	No Impact	No Impact	No Impact	No Impact	No Impact

Assessment of significance of impact on plants and habitats**5.2 Sites and Habitats****5.2.1 Protected Sites**

There are no Special Protection Areas (SPA) or Special Areas of Conservation (SAC) within a 2km buffer of the survey site. The closest SPA is Crymlyn Bog, which lies 10.6km to the south. The closest SAC is the Burry Inlet, which lies 18 km to the west of the site.

NO IMPACT (International or National ecological value, No impact)

The Ownership boundary of the Site abuts three Sites of Special Scientific Interest (SSSI): Cefn Gwrhyd, Rhydyfro SSSI along its western boundary, Gwrhyd Meadows SSSI along its northern boundary and Coed Cwm Du, Cilmaengwyn along a small section of the eastern boundary. None of these SSSI boundaries come into direct contact with either the existing working quarry or the quarry extension. The quarry and the extension area are both well buffered hydrologically from the SSSIs to the north and west by intensively managed pasture land and by topography, with the drainage from the quarry running eastwards into Coed Cwm Du SSSI. Before entering Cwm Du, water quality from the quarry is managed by way of surface water flows directed through peripheral drainage channels and through a series of settlement lagoons. The hydrological study undertaken in 2016 concluded that there would be no impact from any alterations in ground water from the extension of the quarry. Impacts from dust are said to extend to 100m-200m from source, which under certain conditions is likely to result in small deposits reaching the SSSIs. It is unlikely soil chemistry would be modified as it is derived the local rock being quarried. Observations of vegetation around the indicate dust deposition has little impact on species composition, but during dry weather could have minor impact on productivity.

MINOR IMPACT (National ecological value, Minimal impact)

5.2.2 County Wildlife Sites

Figure 2 shows the series of **Sites of Importance for Nature Conservation (SINCs)** that has been adopted by Neath Port Talbot CBC in its Unitary Development Plan, one of which mirrors the eastern boundary of the Cefn Gwrhyd, Rhydyfro SSSI along the western boundary of the Site. No risks are identified that might adversely impact the habitats and species at this and other local SINC sites.

NO IMPACT (County ecological value, No impact)

5.2.3 **Designated Ancient Woodland**

A small 1.15ha ancient woodland unit, identified on the Forestry Commission Ancient Woodland Inventory 2011, as shown on figure 2 lies within the ownership boundary on the east side of the working quarry. There are additional larger units connected to the eastern boundary of the site, which form linkage to the mosaic of woodland units within the local area. There are no proposals to remove or modify the established ancient woodland cover on site and no risks to surrounding units of ancient woodland within the 2km search buffer have been identified.

NO IMPACT (National ecological value, No impact)

5.2.4 Habitats of European Significance

No Annex 1 habitats as defined in the EC Habitats Directive occur within the survey site or are likely to be impacted by the proposed development.

NO IMPACT (International ecological value, No impact)

5.2.5 Section 7 Habitats of Principal Importance and UK BAP Habitats

Habitats of Principal Importance for Conservation of Biological Diversity listed under Section 7 of the Environment (Wales) Act 2016 and UK Biodiversity Action Plan Priority Habitats which may be affected by the proposals include the following:

- Rush-pasture

Section 7 habitats are broadly similar to the Priority Habitats listed under the UK Biodiversity Action Plan. Section 7 habitats are material considerations to which the local planning authority is required to have due regard when determining all planning applications.

Rush-pasture

The quarry extension will remove 0.91ha of rush-pasture. This unit of vegetation was not inspected during this survey because of access constraints, but the species identified during SLR (2016) survey identified a moderately diverse species assemblage indicating it is of local value:

MINOR ADVERSE (Local ecological value, High magnitude)

5.3 **Plants**

5.3.1 Protected Plant Species

Native Bluebells occur in the woodland areas. Bluebell is protected against sale under schedule 8 of the Wildlife and Countryside Act 1981 as amended.

Retention of the woodland areas will ensure the impact on the Bluebell population within the survey site is likely to be:

NO IMPACT (County ecological value, No impact)

Cwm Nant Lleici Quarry Extension: Ecological Assessment Update

5.3.2 Plants of European Significance

No plant species of European significance were recorded or are likely to be present within the survey site. Impact is assessed as

NO IMPACT (International ecological value, No impact)

5.3.3 Section 7 and UK BAP Plant Species

No plants within these categories were recorded or are likely to be present within the survey site. Impact is assessed as

NO IMPACT (National ecological value, No impact)

5.4 Birds

Scoping opinion: No fully protected species are known or suspected of breeding within the assessment site. It is likely a small number of conservation concern depend upon the site, primarily utilising the open grassland and woodland habitats represented, such as Skylark, Dunnock, Song Thrush and Linnet.

5.5 Bats

Scoping opinion: A number of semi-mature oak and birch will be removed from the hedgerows around **F2** and on the lower slope in the north-east of **F1**, as illustrated on figure 2. A check for potential opportunities for roosting bats will need to be undertaken before these features are cleared. It is likely that the woodland and hedgerow features at the site are used by travelling and foraging bats, so it is essential connectivity corridors are maintained and enhanced around the quarry by way of retaining and planting replacement hedgerows. The results of the bat roost potential survey will inform if further mitigation is required.

Should any works be required that might result in disturbance to trees on site, a bat inspection must first be undertaken by a qualified bat surveyor. This should be undertaken at the earliest opportunity, so as to prevent unnecessary delays.

5.6 Water Vole

Scoping opinion: The marginal habitats of **F1** were reported as supporting Water Voles in 2004-2006 survey period (SLR, 2006). It is not anticipated that this area will be quarried for at least 10 years, prior to which the area will need to be resurveyed and assessed for Water Vole, well in advance of works proceeding. No other habitats within the extension area provide suitable habitat to support Water Voles.

5.7 Reptiles

Scoping opinion: The marginal habitats of **F1** need to be assessed for reptiles well in advance of works proceeding in the extension area. No other habitats within the extension area provide suitable habitat to support reptiles.

6. CONSTRAINTS AND OPPORTUNITIES

6.1 Woodland & Hedgerows

It is anticipated that a small 0.2ha pocket of secondary deciduous woodland and 482m of hedgerow will be lost to the quarry extension. In addition to the final restoration plan which will replant as a minimum, an equivalent area of woodland and hedgerow, there are opportunities within the existing landholding to extend and improve the condition of woody vegetation by undertaking supplementary planting of a wider range of native trees and shrubs. Invertebrate and bird diversity could be enriched by planting key invertebrate host species such as Alder Buckthorn *Frangula alnus* and Elder *Sambucus nigra* to attract species such as Brimstone butterfly and Blackcap *Sylvia atricapilla* respectively.

6.2 Grassland

The mosaic of improved and poor semi-improved grassland fields around the periphery of the quarry and farm buildings provide opportunities for delivering a range of biodiversity enhancements.

Section 7 priority farmland birds such as Skylark, Linnet and Reed Bunting are among a range of species that would benefit from the development of flower-rich headlands using a variety of high-yield seed species and cover crops. The fields F3, F4, F5, F7 and F8, being adjacent to the common, are all particularly well suited, as i) there would be minimal impact on existing species-poor grassland and ii) their proximity to the common will greatly increase feeding habitats of the species associated with Gwrhyd SSSIs increasing the resilience of populations occurring there. The development of headlands would also be highly beneficially for Barn Owl, Kestrel *Falco tinnunculus* and reptiles as these features would increase the abundance and density of prey species (primarily voles and mice). The inclusion of additional pollinator-friendly species would also deliver benefits to invertebrates and invertebrate predators species.

6.3 Pioneer vegetation

The bare substrates within the existing quarry provide a wide range of valuable wildlife habitats and features. The undisturbed spoil mounds and banks across the site support a diverse assemblage of plants and almost certainly a similarly diverse suite of associated invertebrates. The operational phases of the quarry will continue to create habitats by default and consideration should be given to incorporating these 'rich', quarry-type features within the after-use phase of the development.

6.4 Birds

The mitigation measures detailed in the SLR (2006) report provide advice to ensure that birds are not disturbed during the breeding season and all operations are lawful. As discussed above (para. 6.2) farmland birds such as Kestrel, Barn Owl, Skylark, Linnet and Reed Bunting

Cwm Nant Lleici Quarry Extension: Ecological Assessment Update

are among a range of species that would benefit from the development of flower-rich headlands using a variety of high-yield seed species and cover crops. The provision of a range of appropriate nest boxes would provide further support for species such as Barn Owl and Kestrel. Additional nest boxes for woodland hole nesters, such as tits, Nuthatch, Redstart and Pied and Spotted Flycatchers, would help increase the carrying capacity of woodland and hedgerow habitats.

6.5 Stone Walls

In addition to the benefits of developing flower-rich headlands for birds and invertebrates, as discussed above, these enhancements would also provide opportunities for predatory mammals and reptiles including Stoat *Mustela erminea*, Weasel *Mustela nivalis*, Adder *Vipera berus*, Common Lizard *Zootoca vivipara* and Slow-worm *Anguis fragilis*. To help support these species, features such as hibernacula and corrugated tin sheets could be simply added at points along the wall base to improve the connectivity and holding potential of these features within the wider landscape.

6.6 Habitat Connectivity

The quarry site provides only limited functionality in terms of connectivity between ecologically valuable habitats such as mature woodland and diverse grasslands found on adjacent lands. However, scrub and hedgerows on site do provide linkages that add to the habitat mosaic within the local landscape. These corridors are likely to be used as travel routes for a limited range of mobile fauna, particularly birds, bats and small mammals. In addition to provisions made to ensure safe travel routes are maintained for such fauna during all phases of work, opportunities exist to provide additional enhancements primarily focussed on delivering better connectivity with the open common, supporting species of grassland and open ground.

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**FIGURE 1: Designated areas
within 2km buffer of Cwm Nant
Lleici Quarry extension area**

-  Quarry Extension Area
-  Ownership Boundary
-  SSSI
-  SINIC
-  Ancient Woodland Inv. 2011

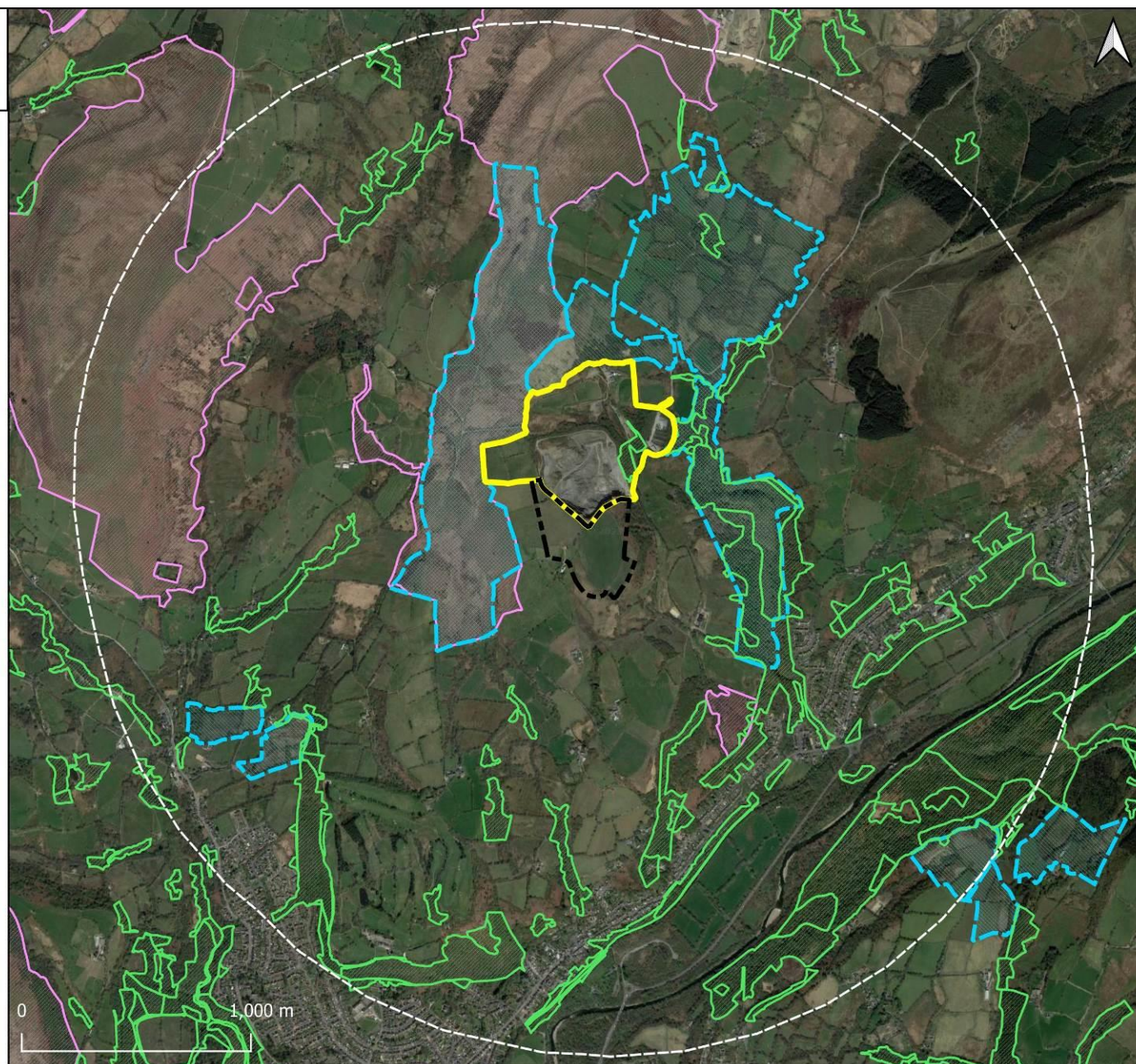
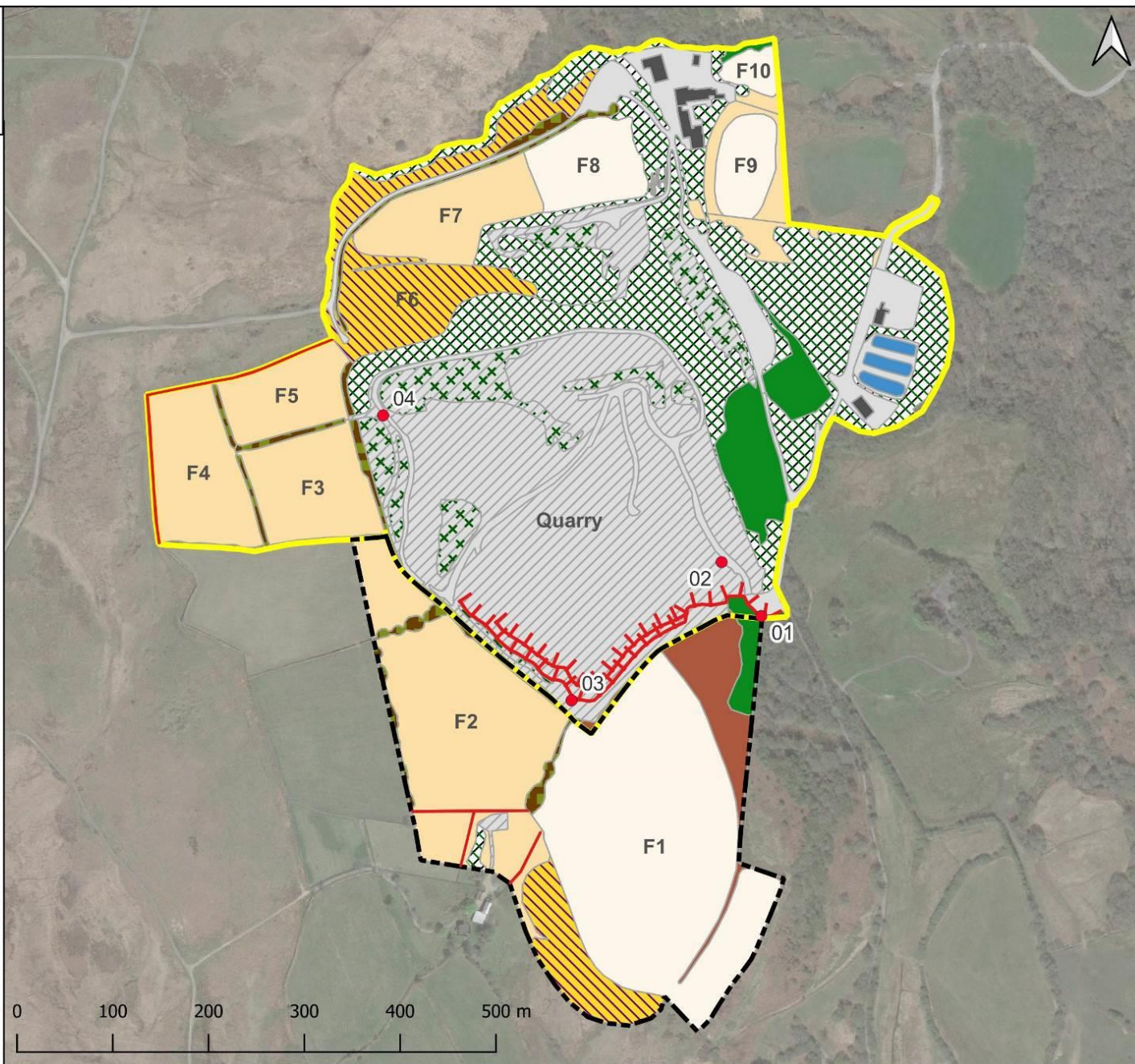


FIGURE 2: Phase I Habitat Survey
Cwm Nant Lleici Quarry, adjacent
land holdings and quarry
extension area



PHOTOGRAPHS

Photo 1: Cliff and pioneer vegetation near quarry entrance.



Photo 2: TN01 mossy cliff face at quarry entrance with species of local interest.



Photo 3: TN01 Cushions of *Amphidium mougeotii* (Mougeot's Yokemoss) on cliff face.



Photo 4: *Bryoerythrophyllum ferruginascens* (Rufous Beardmoss) on quarry floor.



Photo 5: Developing scrub within quarry.



Photo 6: Quarry face and floor with established Birch and Gorse scrub along back edge.



Photo 7: Quarry face with pioneer vegetation around rim



Photo 8: Field (F1) – improved grassland after application of slurry.



Photo 9: **F1** boundary hedge



Photo 10: Natural regeneration of open grassland and Gorse scrub on quarry spoil.



Photo 11: Field **F3** - poor semi-improved grassland



Photo 12: Field **F5** - poor semi-improved grassland



Photo 13: Stone wall along field **F5** – potential site for flower-rich headland and refuges.



Photo 14: Field **F8** - improved grassland



Photo 15: Field **F6** – rush-pasture



Photo 16: Field **F7** –poor semi-improved grassland



Photo 17: Field **F7** – ephemeral pool at lower end of field



Photo 18: Field **F5** - poor semi-improved grassland



Photo 19: Aerial view of quarry



Photo 20: Aerial view of semi-improved grassland fields **F3**, **F4** & **F5**



Photo 21: Aerial view of semi-improved grassland field **F2**



Photo 22: Aerial view of improved grassland field **F1**



Photo 23: Aerial view of unimproved marshy grassland (light straw colour) at southern end of field **F1**



APPENDIX 1

Target Notes recorded during the Phase 1 habitat Survey

The locations of the following Target Notes recorded during the ecological field survey are shown on figure 1, each being a sample of species present within a GIS mapping polygon (each outlined in grey on figure 1).

The Phase 1 Habitat Survey was undertaken by Barry Stewart on 6th March 2023, in bright, breezy conditions.

Target notes have been recorded using MapMate recording software which facilitates these records being incorporated into databases administered by specialist bodies including nationally to the Biological Records Centre at the Centre for Ecology and Hydrology, Wallingford, the Distributional Database maintained by the Botanical Society of the British Isles (BSBI) and to Local Record Centre databases. Such records advance the knowledge and understanding of the distribution and frequency of plants, animals and habitats and enable a more informed approach to be made to future management and conservation of the natural and semi-natural environment and potentially assist with the assessment of the impact that future development and land-use changes may have on habitats and wildlife. These records will be submitted to the various national and local databases in due course.

Key to Species Status mnemonics

Dafor scale

- d dominant
- a abundant
- la locally abundant
- f frequent
- lf locally frequent
- o occasional
- r rare
- p present (no frequency noted)
- ** Lichens
- * Bryophytes (mosses and liverworts)

Taxon	Vernacular	Quantity
[F1] improved grassland with recent application of slurry		
<i>Agrostis capillaris</i>	Common Bent	f
<i>Alauda arvensis</i>	Skylark	2
<i>Brachythecium rutabulum</i>	Rough-stalked Feathermoss	f
<i>Cerastium fontanum</i>	Common Mouse-ear	r
<i>Dactylis glomerata</i>	Cock's-foot	f
<i>Holcus lanatus</i>	Yorkshire-fog	a
<i>Hypochaeris radicata</i>	Cat's-ear	o
<i>Phleum pratense</i>	Timothy	o
<i>Plantago lanceolata</i>	Ribwort Plantain	o
<i>Ranunculus acris</i>	Meadow Buttercup	o
<i>Ranunculus repens</i>	Creeping Buttercup	f
<i>Rumex acetosa</i>	Common Sorrel	lf
<i>Taraxacum agg.</i>	Dandelion	lf
<i>Trifolium repens</i>	White Clover	lf
[F2] poor semi-improved grasslands		

<i>Dactylis glomerata</i>	Cock's-foot	p
<i>Agrostis capillaris</i>	Common Bent	p
<i>Anthoxanthum odoratum</i>	Sweet Vernal-grass	p
<i>Brachythecium rutabulum</i>	Rough-stalked Feathermoss	p
<i>Holcus lanatus</i>	Yorkshire-fog	p
<i>Plantago lanceolata</i>	Ribwort Plantain	p
<i>Poa annua</i>	Annual Meadow-grass	p
<i>Ranunculus acris</i>	Meadow Buttercup	p
<i>Ranunculus repens</i>	Creeping Buttercup	p
<i>Rumex acetosa</i>	Common Sorrel	p
<i>Taraxacum</i> agg.	Dandelion	p
<i>Trifolium repens</i>	White Clover	p
[F2a] Boundary hedge		
<i>Agrostis capillaris</i>	Common Bent	lf
<i>Athyrium filix-femina</i>	Lady-fern	r
<i>Atrichum undulatum</i>	Common Smoothcap	o
<i>Betula pendula</i>	Silver Birch	r
<i>Betula pubescens</i>	Downy Birch	a
<i>Blechnum spicant</i>	Hard-fern	r
<i>Calluna vulgaris</i>	Heather	o
<i>Carex remota</i>	Remote Sedge	r
<i>Cirsium palustre</i>	Marsh Thistle	r
<i>Crataegus monogyna</i>	Hawthorn	lf
<i>Digitalis purpurea</i>	Foxglove	o
<i>Dryopteris dilatata</i>	Broad Buckler-fern	o
<i>Hedera hibernica</i>	Atlantic Ivy	la
<i>Hypericum pulchrum</i>	Slender St John's-wort	o
<i>Ilex aquifolium</i>	Holly	r
<i>Kindbergia praelonga</i>	Common Feathermoss	lf
<i>Mnium hornum</i>	Swan's-neck Thyme-moss	o
<i>Oryctolagus cuniculus</i>	Rabbit	p
<i>Pleurozium schreberi</i>	Red-stemmed Feathermoss	o
<i>Polytrichum juniperinum</i>	Juniper Haircap	o
<i>Prunus spinosa</i>	Blackthorn	r
<i>Pseudoscleropodium purum</i>	Neat Feathermoss	a
<i>Pteridium aquilinum</i>	Bracken	la
<i>Quercus robur</i>	Pedunculate Oak	lf
<i>Rhytidiadelphus squarrosus</i>	Springy Turf-moss	f
<i>Rubus fruticosus</i> agg.	Bramble	f
<i>Salix cinerea</i> subsp. <i>oleifolia</i>	Rusty Willow	o
<i>Sorbus aucuparia</i>	Rowan	r
<i>Thuidium tamariscinum</i>	Common Tamarisk-moss	o
<i>Ulex europaeus</i>	Gorse	o
<i>Vulpes vulpes</i>	Red Fox	p
<u>epiphyte on <i>Quercus robur</i></u>		
<i>Flavoparmelia caperata</i>		p
<i>Lecidella elaeochroma</i> f. <i>elaeochroma</i>	a lichen	p
<i>Parmelia perlata</i>	a lichen	p
<u>epiphyte on <i>Salix cinerea</i></u>		
<i>Frullania dilatata</i>	Dilated Scalewort	lf
<i>Hypnum andoi</i>	Mamillate Plaitmoss	lf
<i>Metzgeria furcata</i>	Forked Veilwort	o

<i>Orthotrichum pulchellum</i>	Elegant Bristlemoss	r
<i>Plenogemma phyllantha</i>	Frizzled Pincushion	o
<i>Ulotia bruchii</i>	Bruch's Pincushion	o
[F3/F4/F5] poor semi-improved grasslands		
<i>Achillea millefolium</i>	Yarrow	r
<i>Agrostis capillaris</i>	Common Bent	a
<i>Anthoxanthum odoratum</i>	Sweet Vernal-grass	p
<i>Brachythecium rutabulum</i>	Rough-stalked Feathermoss	o
<i>Centaurea nigra</i> agg.		o
<i>Cerastium fontanum</i>	Common Mouse-ear	p
<i>Cirsium palustre</i>	Marsh Thistle	r
<i>Dactylis glomerata</i>	Cock's-foot	r
<i>Festuca rubra</i>	Red Fescue	lf
<i>Holcus lanatus</i>	Yorkshire-fog	f
<i>Hypochaeris radicata</i>	Cat's-ear	lf
<i>Kindbergia praelonga</i>	Common Feathermoss	o
<i>Luzula campestris</i>	Field Wood-rush	lf
<i>Phleum pratense</i>	Timothy	o
<i>Plantago lanceolata</i>	Ribwort Plantain	f
<i>Ranunculus acris</i>	Meadow Buttercup	lf
<i>Ranunculus repens</i>	Creeping Buttercup	o
<i>Rumex acetosa</i>	Common Sorrel	o
<i>Taraxacum</i> agg.	Dandelion	f
<i>Trifolium repens</i>	White Clover	r
[F6] rush pasture		
<i>Agrostis canina</i>	Velvet Bent	o
<i>Brachythecium rutabulum</i>	Rough-stalked Feathermoss	o
<i>Calliergonella cuspidata</i>	Pointed Spearmoss	lf
<i>Cardamine pratensis</i>	Cuckooflower	f
<i>Cerastium glomeratum</i>	Sticky Mouse-ear	r
<i>Cirsium palustre</i>	Marsh Thistle	r
<i>Galium palustre</i>	Marsh-bedstraw	r
<i>Holcus lanatus</i>	Yorkshire-fog	d
<i>Hypochaeris radicata</i>	Cat's-ear	r
<i>Juncus acutiflorus</i>	Sharp-flowered Rush	o
<i>Juncus effusus</i>	Soft-rush	a
<i>Juncus inflexus</i>	Hard Rush	o
<i>Persicaria hydropiper</i>	Water-pepper	r
<i>Ranunculus repens</i>	Creeping Buttercup	a
<i>Rumex acetosa</i>	Common Sorrel	o
<i>Rumex conglomeratus</i>	Clustered Dock	o
<i>Trifolium pratense</i>	Red Clover	r
[F7] poor semi-improved grassland (some disturbance from ground levelling)		
<i>Agrostis capillaris</i>	Common Bent	a
<i>Agrostis stolonifera</i>	Creeping Bent	o
<i>Anthoxanthum odoratum</i>	Sweet Vernal-grass	p
<i>Brachythecium rutabulum</i>	Rough-stalked Feathermoss	o
<i>Bryum dichotomum</i>	Bicoloured Bryum	o
<i>Bryum gemmiferum</i>	Small-bud Bryum	r
<i>Bryum rubens</i>	Crimson-tuber Threadmoss	r
<i>Calliergonella cuspidata</i>	Pointed Spearmoss	o
<i>Centaurea nigra</i> agg.	Common Knapweed	o

<i>Cerastium fontanum</i>	Common Mouse-ear	r
<i>Dicranella staphylina</i>	Field Forklet-moss	r
<i>Digitalis purpurea</i>	Foxglove	r
<i>Epilobium ciliatum</i>	American Willowherb	r
<i>Festuca rubra</i>	Red Fescue	lf
<i>Funaria hygrometrica</i>	Bonfire Moss	r
<i>Holcus lanatus</i>	Yorkshire-fog	f
<i>Hypochaeris radicata</i>	Cat's-ear	lf
<i>Lolium perenne</i>	Perennial Rye-grass	o
<i>Lolium perenne</i>	Perennial Rye-grass	o
<i>Luzula campestris</i>	Field Wood-rush	r
<i>Plantago lanceolata</i>	Ribwort Plantain	f
<i>Poa annua</i>	Annual Meadow-grass	o
<i>Ranunculus acris</i>	Meadow Buttercup	o
<i>Ranunculus repens</i>	Creeping Buttercup	lf
<i>Taraxacum</i> agg.	Dandelion	f
<i>Tortula truncata</i>	Common Pottia	r
<i>Trifolium dubium</i>	Lesser Trefoil	r
<i>Tussilago farfara</i>	Colt's-foot	r
<i>Veronica persica</i>	Common Field-speedwell	r
[F7] waterlogged ground adjacent to bund		
<i>Carex demissa</i>	Common Yellow-sedge	r
<i>Carex hirta</i>	Hairy Sedge	o
<i>Galium palustre</i>	Marsh-bedstraw	r
<i>Glyceria fluitans</i>	Floating Sweet-grass	o
<i>Isolepis setacea</i>	Bristle Club-rush	o
<i>Juncus bufonius</i>	Toad Rush	r
<i>Juncus bulbosus</i>	Bulbous Rush	o
<i>Juncus effusus</i>	Soft-rush	lf
<i>Ranunculus flammula</i>	Lesser Spearwort	lf
<i>Ranunculus omiophyllus</i>	Round-leaved Crowfoot	lf
[F8] poor semi-improved grassland		
<i>Agrostis capillaris</i>	Common Bent	f
<i>Brachythecium rutabulum</i>	Rough-stalked Feathermoss	o
<i>Calliergonella cuspidata</i>	Pointed Sparmoss	o
<i>Dactylis glomerata</i>	Cock's-foot	o
<i>Holcus lanatus</i>	Yorkshire-fog	a
<i>Hypochaeris radicata</i>	Cat's-ear	o
<i>Lolium perenne</i>	Perennial Rye-grass	o
<i>Plantago lanceolata</i>	Ribwort Plantain	lf
<i>Ranunculus acris</i>	Meadow Buttercup	o
<i>Ranunculus repens</i>	Creeping Buttercup	o
<i>Rhytidiadelphus squarrosus</i>	Springy Turf-moss	lf
<i>Taraxacum</i> agg.	Dandelion	o
[01] north facing cliff at quarry entrance		
<i>Agrostis capillaris</i>	Common Bent	o
<i>Amphidium mougeotii</i>	Mougeot's Yokemoss	la
<i>Asplenium adiantum-nigrum</i>	Black Spleenwort	r
<i>Asplenium trichomanes</i> subsp. <i>quadrivalens</i>	Maidenhair Spleenwort	r
<i>Athyrium filix-femina</i>	Lady-fern	r
<i>Atrichum undulatum</i>	Common Smoothcap	r
<i>Betula pubescens</i>	Downy Birch	r

<i>Blechnum spicant</i>	Hard-fern	r
<i>Corylus avellana</i>	Hazel	r
<i>Dichodontium pellucidum</i>	Transparent Forkmoss	o
<i>Digitalis purpurea</i>	Foxglove	o
<i>Diplophyllum albicans</i>	White Earwort	lf
<i>Dryopteris affinis</i>	Scaly Male-fern	r
<i>Dryopteris cambrensis</i>	Scaly Male-fern	r
<i>Epilobium brunnescens</i>	New Zealand Willowherb	o
<i>Eurhynchium striatum</i>	Common Striated Feathermoss	o
<i>Fissidens taxifolius</i>	Common Pocketmoss	lf
<i>Fragaria vesca</i>	Wild Strawberry	r
<i>Geranium robertianum</i>	Herb-Robert	r
<i>Hedera hibernica</i>	Atlantic Ivy	lf
<i>Homalothecium sericeum</i>	Silky Wall Feathermoss	o
<i>Hypericum pulchrum</i>	Slender St John's-wort	o
<i>Hypnum cupressiforme</i> var. <i>cupressiforme</i>	Cypress-leaved Plaitmoss	o
<i>Jungermannia atrovirens</i>	Dark-green Flapwort	o
<i>Kindbergia praelonga</i>	Common Feathermoss	o
<i>Lepraria incana</i> sens. lat.	a lichen	o
<i>Mesoptychia badensis</i>	Scarce Notchwort	o
<i>Mnium hornum</i>	Swan's-neck Thyme-moss	o
<i>Pellia epiphylla</i>	Overleaf Pellia	r
<i>Pogonatum aloides</i>	Aloe Haircap	r
<i>Pogonatum urnigerum</i>	Urn Haircap	o
<i>Pohlia wahlenbergii</i> var. <i>wahlenbergii</i>	Pale Glauous Threadmoss	r
<i>Polytrichum formosum</i>	Bank Haircap	r
<i>Quercus robur</i>	Pedunculate Oak	r
<i>Rubus fruticosus</i> agg.	Bramble	o
<i>Salix cinerea</i> subsp. <i>oleifolia</i>	Rusty Willow	r
<i>Scapania undulata</i>	Water Earwort	o
<i>Sciuro-hypnum plumosum</i>	Rusty Feathermoss	o
<i>Vaccinium myrtillus</i>	Bilberry	r
quarry floor and bunds		
<i>Agrostis capillaris</i>	Common Bent	r
<i>Baeomyces rufus</i>	a lichen	o
<i>Barbula unguiculata</i>	Bird's-claw Beardmoss	o
<i>Bryoerythrophyllum ferruginascens</i>	Rufous Beardmoss	o
<i>Bryum dichotomum</i>	Bicoloured Bryum	lf
<i>Buddleja davidii</i>	Butterfly-bush	o
<i>Carex pendula</i>	Pendulous Sedge	r
<i>Ceratodon purpureus</i>	Redshank	o
<i>Chamerion angustifolium</i>	Rosebay Willowherb	r
<i>Cirsium palustre</i>	Marsh Thistle	r
<i>Cynosurus cristatus</i>	Crested Dog's-tail	r
<i>Dactylis glomerata</i>	Cock's-foot	r
<i>Dicranella howei</i>	a moss	o
<i>Dicranella rufescens</i>	Rufous Forklet-moss	r
<i>Didymodon fallax</i>	False Beardmoss	r
<i>Didymodon insulanus</i>	Cylindric Beardmoss	o
<i>Fragaria vesca</i>	Wild Strawberry	o
<i>Hirschfeldia incana</i>	Hoary Mustard	o
<i>Holcus lanatus</i>	Yorkshire-fog	r

<i>Hypericum pulchrum</i>	Slender St John's-wort	o
<i>Juncus effusus</i>	Soft-rush	r
<i>Juncus inflexus</i>	Hard Rush	r
<i>Leontodon saxatilis</i>	Lesser Hawkbit	r
<i>Polypodium interjectum</i>	Intermediate Polypody	r
<i>Prunella vulgaris</i>	Selfheal	r
<i>Racomitrium ericoides</i>	Dense Fringemoss	o
<i>Racomitrium heterostichum</i> s. str.	Bristly Fringemoss	r
<i>Salix viminalis</i>	Osier	r
<i>Trifolium dubium</i>	Lesser Trefoil	r
<i>Tussilago farfara</i>	Colt's-foot	r
<i>Ulex europaeus</i>	Gorse	lf
quarry rim and bunds		
<i>Atrichum undulatum</i>	Common Smoothcap	r
<i>Baeomyces rufus</i>	a lichen	r
<i>Bellis perennis</i>	Daisy	r
<i>Calliergonella cuspidata</i>	Pointed Spearmoss	r
<i>Ceratodon purpureus</i>	Redshank	o
<i>Cirsium vulgare</i>	Spear Thistle	r
<i>Cladonia fimbriata</i>	a lichen	r
<i>Conyza floribunda</i>	Bilbao's Fleabane	r
<i>Dicranella howei</i>	a moss	o
<i>Didymodon ferrugineus</i>	Rusty Beardmoss	o
<i>Didymodon tophaceus</i>	Olive Beardmoss	o
<i>Epilobium hirsutum</i>	Great Willowherb	r
<i>Grimmia pulvinata</i>	Grey-cushioned Grimmia	r
<i>Grimmia pulvinata</i>	Grey-cushioned Grimmia	r
<i>Hypnum jutlandicum</i>	Heath Plaitmoss	r
<i>Hypnum jutlandicum</i>	Heath Plaitmoss	r
<i>Hypochaeris radicata</i>	Cat's-ear	r
<i>Kindbergia praelonga</i>	Common Feathermoss	r
<i>Lotus corniculatus</i>	Common Bird's-foot-trefoil	r
<i>Luzula multiflora</i>	Heath Wood-rush	r
<i>Pilosella officinarum</i>	Mouse-ear-hawkweed	r
<i>Plantago coronopus</i>	Buck's-horn Plantain	r
<i>Pleuridium acuminatum</i>	Taper-leaved Earthmoss	r
<i>Pogonatum urnigerum</i>	Urn Haircap	lf
<i>Polytrichum juniperinum</i>	Juniper Haircap	o
<i>Polytrichum piliferum</i>	Bristly Haircap	r
<i>Pseudoscleropodium purum</i>	Neat Feathermoss	lf
<i>Pulicaria dysenterica</i>	Common Fleabane	r
<i>Racomitrium ericoides</i>	Dense Fringemoss	r
<i>Sagina procumbens</i>	Procumbent Pearlwort	o
<i>Sagina procumbens</i>	Procumbent Pearlwort	o
<i>Schistidium apocarpum</i>	Sessile Grimmia	r
<i>Streblotrichum convolutum</i> var. <i>convolutum</i>	Lesser Bird's-claw Beardmoss	lf
<i>Taraxacum</i> agg.	Dandelion	r
<i>Veronica serpyllifolia</i>	Thyme-leaved Speedwell	r