

Ancient Woodland Restoration – Bwlch Corog

Bwlch Corog

Ancient Woodland Survey and Recommendations for Management

Prepared by Adam Thorogood (Woodland Trust), Summer 2017

Bwlch Corog Ancient Woodland element - Bing aerial



Woodland Name: Bwlch Corog (Coed Llechwedd Einion)

Location: Near Glaspwll, Machynlleth

Grid ref: SN 739965

Total Woodland Area: 9.88 Hectares (Ha) – part of larger Bwlch Corog site

Area PAWS: 1.15 Ha

Area ASNW: -

Area RAWS: 4.37 Ha

Area AWI Unknown: 3.28 Ha

Designations: None within site boundary but Llyfnant SSSI close by

Ownership: Cambrian Wildwood Project/Woodland Trust

Managed By: Cambrian Wildwood Project

Field Survey: July 2017

Report Date: August 2017

Report Author: Adam Thorogood (Ancient Woodland Restoration Officer, Woodland Trust)

Ancient Woodland Restoration – Bwlch Corog

1. INTRODUCTION

This report provides an overview of the ancient woodland at Bwlch Corog. The report is produced as part of the Woodland Trust's Heritage Lottery Fund (HLF) funded "Ancient Woodland Restoration" project. Particular focus is upon the plantation on ancient woodland (PAW) and the restored ancient woodland (RAW) areas, their remnant features, and their restoration. It sets out recommendations for the management of the PAW, RAW, and associated woodland where relevant.

The report does not constitute a full management plan and is therefore not approved to be UK Forestry Standard (UKFS) compliant for the purposes of applying for felling licences or grant funding. Although the recommendations made are based on sound sustainable forest management principles. Any additional forestry operations that arise as a result of this report, not already covered by an existing felling licence, will necessitate an application for an additional felling licence through Natural Resources Wales (NRW).

2. SUMMARY OF ANCIENT WOODLAND & RECOMMENDATIONS

The majority of the existing woodland at Bwlch Corog is situated at the northern-most tip of the site and runs along the steep-sided stream gully of Nant Cefn Coch which flows on to join the Afon Llyfnant. The elevation of the site drops from just under 250m asl down to around 100m asl and takes in fridd-type upland habitat and bryophyte-rich oceanic-Atlantic deciduous woodland. Along steep stream sides, where the access is difficult, woodland cover appears to have been continuous with the survey finding a diverse suite of woodland specialist flora and lower plants under a canopy of mature broadleaves, particularly oak, birch, hazel and ash. Elsewhere on site, where the topography is more favourable, woodland cover was cleared for pasture in the past, leaving scattered remnant broadleaves and creating a landscape more suggestive of wood pasture. Across these bracken-dominated upland slopes, relief from grazing pressure has created pockets of regeneration and some scattered oak planting has led to small stands of site-native trees. Just over one hectare of the site was planted up with Japanese Larch in second rotation and so would have been felled and restocked in the early 1990s when neighbouring woodlands were also clear felled. This compartment is ecologically impoverished yet still displays a number of woodland specialist species and pockets of regeneration within the understory.

The majority of the ancient woodland within the site is in a secure condition, mainly due to the topography making it unsuitable for grazing. Where there are threats, it is from the canopy cover of Japanese Larch, the presence of ash dieback on site, the dominance of bracken at higher elevations and also from conifer seed drift from neighbouring plantation forestry. However, the proximity of threatened areas to secure, species-rich semi-natural habitats means that the potential for restoration and regeneration of the ancient woodland at Bwlch Corog is high. Sensitive thinning of the plantation larch should be carried out gradually in order to retain woodland structure whilst reducing conifer basal area, increasing light levels and allowing regeneration of semi-natural habitat. However, the stand should be regularly monitored for the presence of *Phytophthora ramorum*, the appearance of which will necessitate a clear fell. If the Larch remains healthy, the transformation to an irregular structure over time will safeguard and enrich the ancient woodland features on site whilst increasing the resilience of the woodland. A regime of conservation grazing should be instigated where bracken dominates. Cattle should provide the weight needed to break up the dense stand of bracken and create niches for regeneration of broadleaf trees. Stocking numbers and

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timing of grazing should be worked out so as to achieve the optimum conditions for regeneration of native floral species.

3. SITE OVERVIEW

3.1 Location and Landscape

Bwlch Corog Ancient Woodland element (black outline) - showing AWI layer and proximity to local SSSI

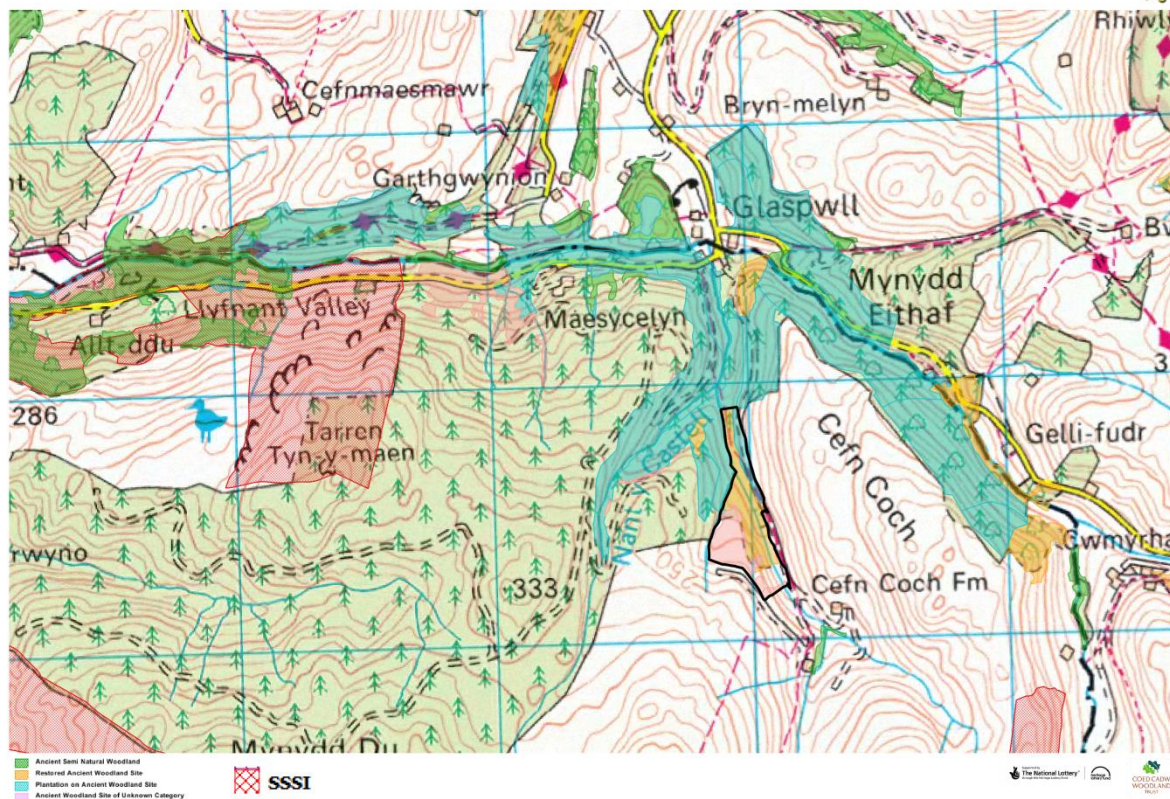


Figure 1: Bwlch Corog ancient woodland and surrounding landscape

3.2 Designations

There are no designations on the site itself, however, Bwlch Corog sits within an ecologically important landscape and there are several SSSIs close by. Cwm Llyfnant SSSI is an ancient woodland site to the west supporting a rich lower plant flora within a predominantly Sessile Oak woodland. Pencarreg Gopa a Moel Hyrddod and Pencreigiau'r Llan are both upland SSSIs in acid-sensitive catchments.

3.3 Geology, Soils & Ecology

The geology underlying Bwlch Corog is mudstone, siltstone and sandstone of the Ashgill Rocks formation. This sedimentary bedrock was formed 444 to 451 million years ago in the Ordovician period when the area was beneath the sea. The soils on site are freely draining acid loams over rock, soils of low fertility that typically support upland rough grazing pasture and oak woodlands.

Species indicative of National Vegetation Classification (NVC) categories W7, W11, and W17 were found during the survey:

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W7: *Alder – Ash – Yellow Pimpernel woodland*, a community typical of wet or moist soils.

W11: *Sessile oak – Downey birch – Wood sorrel woodland*, a community of moist, free draining, base-poor soils.

W17: *Sessile oak – Downey birch – *Dicranum majus* woodland*, a community of very acid, thin soils in areas of high rainfall.

(See section 5 below for a link to more information on NVC woodland categories)

3.4 Access

Bwlch Corog is accessed via the narrow B-road that runs through Glaspwll. The road is steep in places and there are several tight bends making access by timber lorry difficult but not impossible. Compartments 1 & 2 (see map below) can be accessed on foot via the track to Cefn Coch farm and there is an old bridle way that runs up from Glaspwll along the stream, crossing from one side to another and then climbing to meet the Cefn Coch farm track before moving up onto Bwlch Corog itself. This bridle way needs clearance work along its length in order to reinstate it, cooperation between several neighbouring landowners will be needed in order to do this. There is also an old track that drops down through compartment 2 that was presumably used to extract timber in the past, this could also be

reinstated. Some parts of the site detailed in this report are very hard to access, particularly the steep sides of Nant Cefn Coch. Compartments 3 & 4 are accessed via a track that runs up from the Cefn Coch cottages.

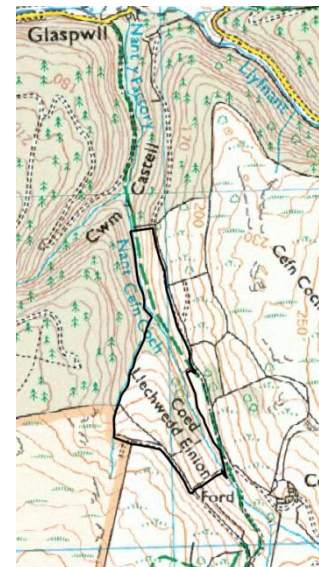


Figure 2: Bridle way through the site

3.5 Brief History

Bwlch Corog is a much larger site and the survey was only carried out on the 9.88 hectares which are included in the ancient woodland inventory (AWI). The majority of this area can be considered ancient woodland; however there are some discrepancies and areas included on the AWI which have been open field in the past. Looking at the early maps of the site (figures 3 and 4 below) we can see that compartments 1 & 2 are depicted as wooded on the tithe map (1838-1850) and the Epoch 1 OS map (~1880). Compartments 3 & 4 are shown on the tithe map as open fields; however the Epoch shows individual field trees in compartment 3 which are still standing today and compartment 4 contains a small area of RAWs on the edge of what was an open field but is now secondary woodland. Given the ecological importance of the open field trees and also the ancient woodland indicators found within compartments 3 & 4, especially along boundaries, we can include these compartments in this restoration plan.

Little management has been carried out on this small area of the larger Bwlch Corog site over the years. Broadleaves were felled and planted with 2 rotations of conifers in compartment 1 and planting of oak has been carried out in compartments 3 and 4 but not under any of the grant schemes.

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Figure 3: Tithe map (1838 - 1855) showing woodland cover at the time. Taken from cynefin.archiveswales.org.uk

Bwlch Corog Ancient Woodland element - Epoch 1 OS map (~1880s)

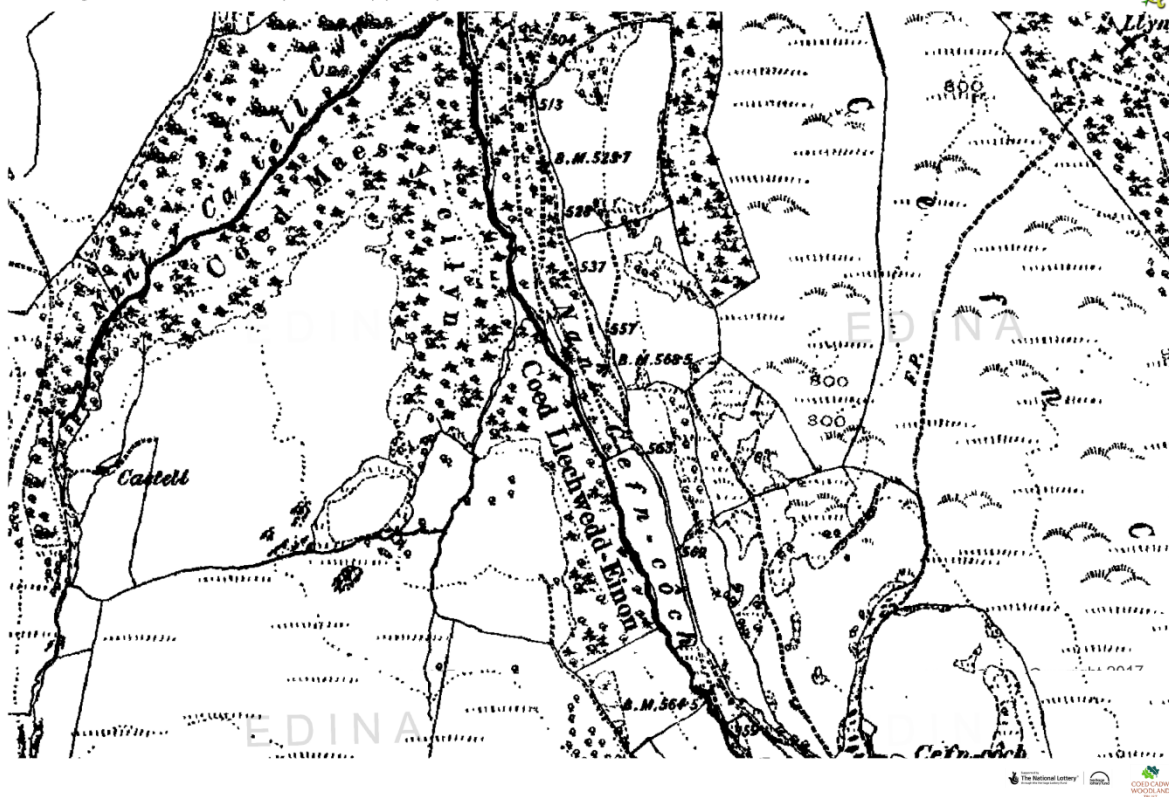


Figure 4: Bwlch Corog Epoch 1 (~1880s) showing woodland cover

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4. WOODLAND SURVEY

4.1 Key Findings and Recommendations (see section 7 “Context” for info on threat levels and priorities)

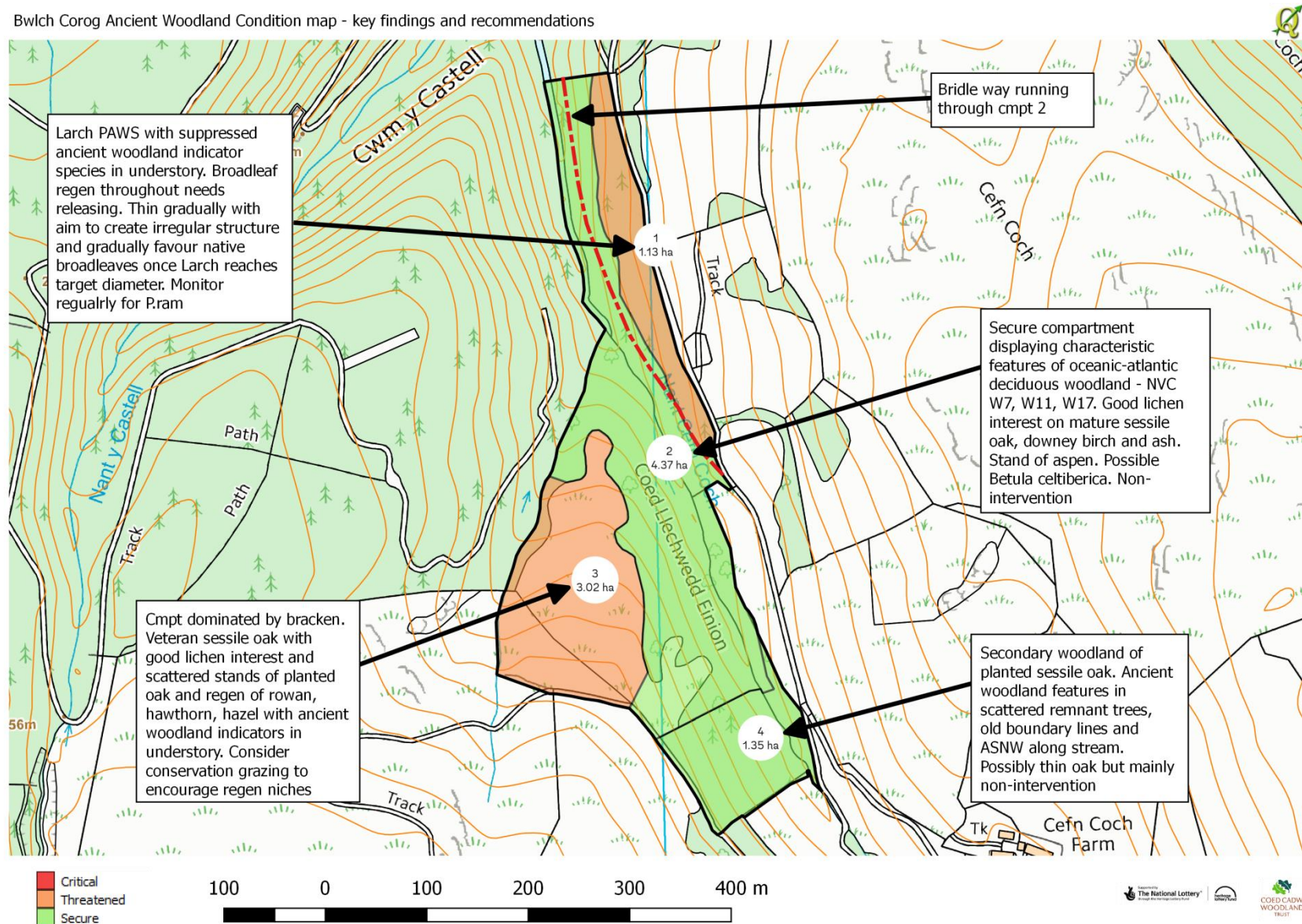
Cmpt.	Compartment Description – Including Tree Canopy, Understory/Regeneration species: (Red = Considered Non-Native/impactful) (Green = any notable, pre-plantation, veteran or ancient trees)	Ground Vegetation (Green = Considered an Ancient Woodland Indicator Plant) (Red = Considered Non-Native/impactful)	Other Important Features (deadwood, archaeology, epiphytes/ other biodiversity. Green- Considered to be indicative of ancient woodland)	Threat Level (Secure / Threatened / Critical – described below)	Management Recommendations (Priority Level in Brackets – described above)
1	Thin strip of Japanese larch PAWS running along trackside. Broadleaf understory: Sessile oak, Downey birch, Rowan, Hazel, Hawthorn	Slender St John’s wort, Bluebell, Wavy hair grass	Telephone line runs parallel to the track along the boundary of cmpt. Cmpt needs more quantity and variety of deadwood	Threatened	JL needs to be monitored for Phytophthora ramorum. Light thin of JL taking into account wind dynamics on site, this will increase light levels to understory and also prevent suppression of features in cmpt 2. Also if resources allow, high pruning of remaining larch would improve timber value and further increase light levels to understory. Aim to create an irregular structure through consistent light thinning until single tree selection can be instigated driven by target diameter in the JL. Gradually prioritise the broadleaf regen as JL reaches financial maturity. Consider some ring barking where safe to create more standing deadwood.
2	Large steep river gully compartment categorised as AWI RAWS but this looks like a mistake, survey found undisturbed ASNW. Areas of rocky outcrop. Cmpt displaying characteristics of NVC W7, W11 & W17 Canopy is predominantly Sessile oak, Downey birch, Ash with Rowan, Hazel in lower canopy and shrub layer. Possible stand of Betula celtiberica but this needs further surveying to confirm.	Bilberry, Hard fern, Scaly male fern, Wavy hair grass, Honeysuckle, Wood sorrel, Meadow fescue, Greater stitchwort, Opposite-leaved Golden-saxifrage, Yellow pimpernel, Climbing corydalis, Tufted hair grass, Enchanters nightshade, Wood sedge, Common polypody, Hairy wood rush, Wood speedwell, Beech fern, Lemon-scented fern	Good level of broadleaf deadwood from windblow and standing deadwood from natural senescence. Stichta silvatica, Stichta limbata, Graphina ruiziana, Graphina pauciloculata, Sphaerophorous globosus, Pertusaria amara, Parmelia parvula,	Secure	Re-categorise on AWI as ASNW (RAWS classification is a mistake) Non-intervention would be a good strategy considering security of ancient woodland features and the inaccessibility of the majority of cmpt. Monitor the impact of ash dieback. Access – make sure bridal way is clear and open. Site has potential for guided woodland walks and demonstrations, access for visitors along the stream-side and further up onto Bwlch Corog would be ideal, a

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	Small stand of Aspen close to boundary with cmpt 3. Good regen from suckering. Doesn't seem to be planted and is perhaps site native?	Common valerian, Dog violet, Bracken, Marsh violet, Common bent, Purple moor grass,	Usnea fragulescens, Peltigera horizontalis Dichranum majus, Dichranum scoparium, Sphagnum squarrosum, Diplophilum albicans Red cracked boletus		bridge across Nant Cefn Coch would be necessary for access to the higher elevations of the site. Monitor cmpt for conifer regen from neighbouring cmpts and other forest units, remove.
3	Bracken dominated cmpt. AWI Unknown, cleared for grazing in the past. Woodland cover remains along stream edge and boundary with cmpt 2. Small stands of Sessile oak , Rowan and Hazel with a few scattered remnant veteran Sessile oak (depicted as field trees on the Epoch 1 map – see above) with good lichen interest and woodland indicators within the understory. Younger oak within cmpt was planted (tree guards found) probably at same time as planting in cmpt 4. Willow more frequent in scattered stands close to cmpt 2 boundary. Veteran Downey birch (see note on B. celtiberica above) and Crab apple along boundary with cmpt 4.	Bracken Agrostis sp., Tufted hair grass, Climbing corydalis , Holcus mollis , Scaly male fern , Common polypody , Honeysuckle , Bluebell , Wood sorrel , Wavy hair grass , Bilberry	Stichta sf sylvatica	Threatened	Light conservation grazing recommended in order to promote regeneration of semi-natural flora. Consider winter grazing with cattle in order to break up dense bracken and to encourage regeneration niches. Seed sources in broadleaf stands within cmpt and from outside cmpt. Grazing timings and stocking densities need consideration, care must be taken not to damage veteran oak with lichen interest or small stands of planted oak. Over time, regeneration will increase and broadleaf canopy expansion will suppress bracken. Remove tree guards from planted oak.
4	Mainly secondary woodland (planted sessile oak) with small areas of AWI Unknown, several remnant broadleaves (oak , birch , hazel , rowan , hawthorn) scattered throughout stand and on old field boundaries. Planted oak squirrel damaged. Continuation of ancient woodland along stream-side (not covered on AWI) although it is less steep than cmpt 2, hotspots of birch and willow with good lichen interest.	Large stands of Marsh violet Wood sorrel , Yellow pimpernel , Greater stitchwort , Bluebell , Tufted hair-grass, Purple moor-grass	Good dead wood from windblow and senescence Peltigera horizontalis (on Ash) Stichta fuliginosa (on Willow)	Secure	Remove tree guards from planted oak. Possibly consider thinning oak (fell to waste in order to give some more light to better oak) but stand is squirrel damaged and access is difficult so it might not be worth the effort, not a priority considering other actions needed on site.

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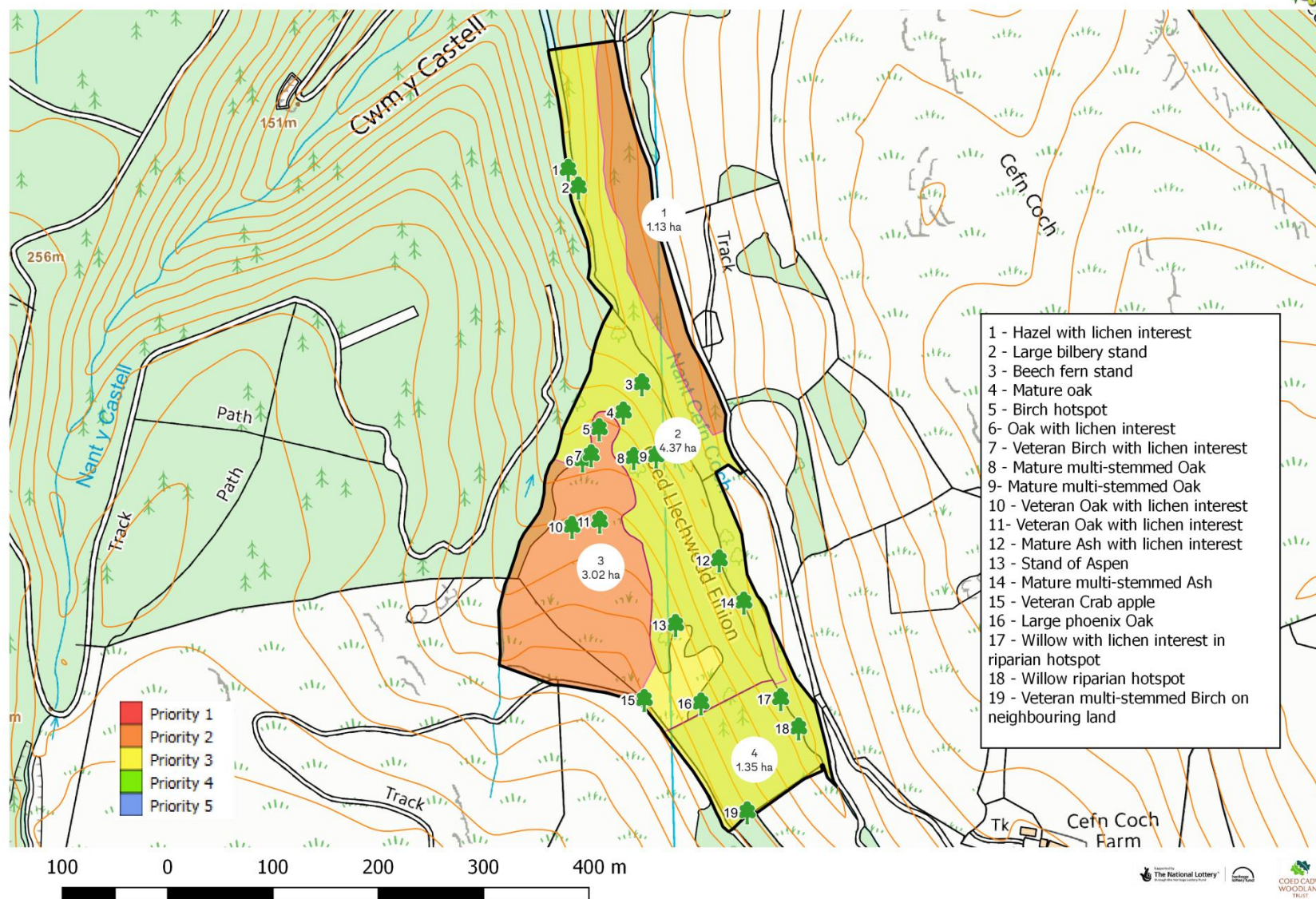
Bwlch Corog Ancient Woodland Condition map - key findings and recommendations



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Bwlch Corog Ancient Woodland Priorities map - showing biodiversity points (see table below)



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4.2 Lichen Survey

Coed Llechwedd Einion (Bwlch Corog/Cefn Coch). Joe Hope, Alastair Hotchkiss, Adam Thorogood (20/07/2017)

Lichen	Context	Cmpt, Grid ref or Biodiversity point BP# (see map above)	List
Arthonia cinnabarina	Hazel	Cmpt 2	
Chrysothrix candelaris	Old birch	Cmpt 2	
Collema subflaccidum	Oak	Cmpt 3 (SN 739964) BP10	NIEC
Cystocoleus ebanus	Saxicolous on shaded rockface	Cmpt 2	
Dimerella lutea	Oak	Cmpt 3 (SN 739964) BP11	RIEC NIEC S7 Lobarion Wales Red List-Near Threatened
Evernia prunastri	Oak	Cmpt 2	
Graphina ruiziana	Hazel	Cmpt 2 (SN 739967) BP1	EUOCIEC Nationally Scarce, *IR
Graphina pauciloculata	With G.ruiziana on Hazel	Cmpt 2 (SN 739967) BP1	S7 Species. Wales Red List – Endangered. Nationally Rare. *IR
Hypotrachyna laevigata	Birch	Cmpt 2	EUOCIEC
Micarea cf. alabastrites	?Birch	Cmpt 2	NIEC EUOCIEC. *IR
cf.Mycoporum antecellans	Hazel	Cmpt 2	NIEC
Nephroma laevigatum	Oak	Cmpt 3 (SN 739964) BP10	RIEC NIEC S7Lobarion. Wales Red List- Near Threatened. *IR
Normandina pulchella	Very frequent, on Hazel, Ash & Oak	Cmpt 2	S7Lobarion
Ochrolechia androgyna	Birch, Oak	Cmpt 2	
Parmeliella parvula	On 2 Oaks, abundant on 1	Cmpt 2	NIEC S7Lobarion. Wales Red List – Near Threatened. *IR
Parmelia saxatilis	Birch, Oak & ?Ash	Cmpt 2	
Peltigera horizontalis	Ash	Cmpt 2 (SN 740964) BP12	RIEC NIEC S7Lobarion
Peltigera hymenina	Ash, Oak	Cmpt 2	
Peltigera praetextata	Ash, Oak	Cmpt 2	
Pertusaria amara	Oak	Cmpt 2	
Pertusaria hymenea	Oak	Cmpt 2	
Pertusaria leioplaca	Oak	Cmpt 2	
Pertusaria pertusa	?Oak	Cmpt 2	
Phaeographis inusta	Young Ash	Cmpt 2	NIEC. Nationally Scarce. *IR
Platismatia glauca	Birch, Oak	Cmpt 2	

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Ramalina farinacea	Oak	Cmpt 2	
Sphaerophorus globosus	Old Birch	Cmpt 2 (SN 739965) BP7	EUOCIEC
Sticta cf. canariensis (blue-green morph = S. dufourii)	rare, on hazels along southern bank of stream in cmpt 2	Cmpt 2	NIEC* Section 7 Species. S7Lobarion. Wales Red List- Vulnerable. *IR
Sticta fuliginosa	Hazel, Ash, Willow, ?Oak, including some large thalli	Cmpt 2, Cmpt 4 (SN 741962) BP17	RIEC NIEC S7Lobarion Wales Red List- Vulnerable. *IR
Sticta limbata	Oak	Cmpt 3 (SN 739964) BP10	RIEC NIEC S7Lobarion Wales Red List- Near Threatened. *IR
Sticta sylvatica	Hazel, Ash, Oak	Cmpt 2	RIEC NIEC S7Lobarion Wales Red List- Near Threatened. *IR
Thelotrema lepadinum	Hazel, rare in site, near to site boundary	Cmpt 2	RIEC NIEC S7Lobarion Wales Red List – Near Threatened.
Usnea cornuta	Birch, Oak	Cmpt 2	
Usnea fragilesceus	Oak	Cmpt 2	
Usnea subfloridana	Oak	Cmpt 2	

Bold = generally considered the ‘notable’ species at this site in light of their rarity, threat or occurrence on ecological continuity lists.

RIEC=Revised Index of Ecological Continuity

NIEC=New Index of Ecological Continuity

EUOCIEC - Eu-Oceanic Calcifuge Index of Ecological Continuity

*IR = populations of this species in Britain are considered by Woods & Coppins (2003) to be of international importance, generally on account of their abundance in Britain compared to the rest of the world

5. PHOTOGRAPHS



Figure 5: Bryo and fern rich ASNW cmpt 2

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Figure 7: mature oak over stream cmpt 2



Figure 6: PAWS/ASNW edge cmpts 1 & 2



Figure 8: Neighbouring woodland showing conifer regen

Figure 9: Bracken with scattered broadleaf stands cmpt 3



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Figure 11: Veteran oak cmpt 3 (Biodiversity point 11)



Figure 10: Planted oak cmpt 4



Figure 13: Aspen sapling cmpt 2 (Biodiversity point 13)



Figure 12: *Stichta fuliginosa* on Willow cmpt 4 (Biodiversity point 17)

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6. GENERAL CONSTRAINTS AND CONSIDERATIONS

Inventory and monitoring – Before undertaking any management work on site, it would be useful to carry out an inventory of current standing timber volumes and basal area, this will enable thinning intensities to be calculated accurately and will inform subsequent work.

Felling licence – By law, woodlands in Wales that are to have more than 5m³ of timber removed in one calendar quarter, must apply for and be granted a felling licence by Natural Resources Wales. More information on felling licences can be found here:

<https://naturalresources.wales/forestry/tree-felling-and-other-regulations/tree-felling-licences/?lang=en>

Windblow – Consider comments made in recommendations table regarding wind dynamics and thinning operations. Management interventions should be planned to minimise windthrow risk. There should be a new version of the Forestry Commission’s decision support system “ForestGales” out soon, this should help with planning operations: <http://www.forestry.gov.uk/forestgales>

Deadwood – Significant/large fallen and standing deadwood should be left in situ. Efforts should be made to increase deadwood component across all compartments.

Disease:

Evidence of *Hymenoscyphus fraxineus* (chalara dieback of ash) was found onsite. Dead sapling trees and fruiting bodies on leaf racemes from mature ash were found. Current advice is to only fell trees if they present a health and safety risk. Link to Forestry Commission GB page on ash dieback:

<https://www.forestry.gov.uk/ashdieback>

Japanese Larch on site should be checked and monitored for signs of *Phytophthora ramorum*. NRW will carry out a check prior to the provision of a felling licence including any Larch stands. Advice on managing *P. ram* as well as biosecurity measures can be found here:

<http://www.forestry.gov.uk/forestry/infd-868egu>

A map showing the distribution of *P. ram* in Wales as of June 2016 can be found here:

<https://naturalresources.wales/media/678658/pr-distribution-june-2016.pdf>

National Vegetation Classification:

Link to guide on Woodland NVC types: <http://jncc.defra.gov.uk/PDF/fieldguidetowoodland.pdf>

Sites of Special Scientific Interest

SSSI citation for Cwm Llyfnant

https://naturalresources.wales/media/658216/SSSI_1049_Citation_EN0015b15.pdf

See link below for guidance on carrying out work in or close to a SSSI:

<http://naturalresources.wales/conservation-biodiversity-and-wildlife/find-protected-areas-of-land-and-seas/guidance-to-site-of-special-scientific-interest-sssi-land-owners-and-occupiers/?lang=en>

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Formative pruning:

See link below for guidance on formative pruning of young trees:

<http://laisygoedwig.org.uk/wp-content/uploads/2013/12/formative.pdf>

7. CONTEXT

7.1 Ancient Woodlands

This site includes areas classified as ancient woodland. This information is taken from the Ancient Woodland Inventory (AWI), a survey of all ancient woodland in the UK started in 2004 and last reviewed in 2011. The category assigned to this site is “plantation on ancient woodland site”, also known as PAWS, however, different types of ancient woodland can be found in the surrounding landscape (see **Map #**). The AWI uses four different classifications of ancient woodland:

7.2 Ancient Semi-Natural Woodland (ASNW)

ASNW is a classification that is given to sites within Wales that are considered to have had continuous woodland cover since at least 1600. This can be established through the use of a variety of physical documentation such as estate maps or records, or physical evidence on site, including significant species of plants (ancient woodland indicator species) and archaeology. These sites include habitats which are amongst the most ecologically diverse in the UK, due to their relative lack of disturbance over centuries. However, they are now extremely scarce, and make up just 2% of our woodland cover. Those ASNW that remain are a precious resource that requires protection and careful management.

7.3 Plantation on Ancient Woodland Site (PAWS)

PAWS are woodland sites where the natural broadleaf (excluding Scots Pine in Scotland) mixture of trees and shrubs has been replaced by plantations, usually (but not exclusively) consisting of non-native conifers. This process, and the subsequent effects of the plantation, once established, can have a variety of negative impacts upon the woodland, the extent of which is dependant upon the establishment methods used, the species planted and the success of plantation establishment.

7.4 Restored Ancient Woodland Site (RAWS)

The Woodland Trust categorises RAWS as woodlands which are predominately broadleaves now (>80%) and are believed to have been continually wooded for over 400 years. They will have gone through a phase when canopy cover will have been more than 50% non-native conifer tree species and now have a canopy cover of more than 80% broadleaf species. Any ancient woodland remnants are considered secure. The term restored ancient woodland does not mean that the woodland is necessarily fully restored or that it is in good ecological condition. Active restoration work may well be essential to consolidate the improvement in condition or to improve it further.

7.5 Ancient Woodland of Unknown Category

Finally, the forth classification used by the AWI is the ancient woodland of unknown category. These sites are wooded but it was difficult to classify them properly using resources available at the time the AWI was compiled. The Ancient Woodland Restoration project should be able to fully classify such sites.

7.6 Ancient Woodland Restoration

The Woodland Trust’s approach to Ancient Woodland Restoration can be summarised as follows:

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- The approach starts from the premise that all PAWS are likely to retain some of the ecological and archaeological value from their ancient woodland origin.
- We advocate two operational phases, which may occur at the same time within different parts of the woodland:
 1. Maintain and enhance remnant ancient woodland features by reducing immediate threats to their survival. This process may take some years.
 2. Make long term improvement to the general ecological value of the site, by gradually shifting the canopy towards a more semi-natural species composition and structure.
- Planning and operations are based on site surveys, as set out within this report, that identify the type, distribution and condition of remnant ancient woodland features, which fit broadly into the following categories:
 - Ground flora and other important woodland specialist species
 - 'Dead' wood
 - Archaeology
 - Pre-plantation trees, i.e. trees that pre-date plantation's establishment. These will usually be native species, of significant age, size, and/or have 'veteran' characteristics.
- Action to conserve and enhance remnant ancient woodland features is prioritised based on the level of threat, with urgent and careful attention being directed to those most at risk.
- The approach is in essence about gradual change, in particular the management of light levels, as most threats to remnant ancient woodland features may come from either excessive shade or light.
- The emphasis is not simply on replacing the plantation crop with native trees and should seldom require rapid or complete removal of non-native conifers.

7.7 Ancient Woodland Remnant Features

This report identifies the visible remnants of the ancient woodland still remaining on the site. Action to conserve and enhance these features is prioritised based on the level of threat, with attention being directed to those most at risk. The threat levels of the site (or compartments within the site) are considered in three categories; those being secure, threatened and most critical. The categories are colour coded for ease of identification with the document:

- **Secure:** likely to remain the same or improve given current conditions.
- **Threatened:** unlikely to be lost in the short term, given current conditions, but long term survival is doubtful without intervention.
- **Critical:** need urgent action to avoid irreversible, loss or serious deterioration.

Furthermore, a scoring system of 1 to 5 is used to help prioritise further in considering the short-term management aims (1 being highest priority), which will also take into account various operational constraints or other objectives:

- **Priority 1:** Critical works to offset an immediate risk e.g. halo thinning of dying pollards – Immediate action as is reasonably possible.
- **Priority 2:** Pressing work to threatened areas – Under take within 1 year.
- **Priority 3:** Works definitely to be completed in plan period – Undertake 1-3 years.
- **Priority 4:** More medium term work priority, might carry over into next plan period – Undertake 3-5 years.
- **Priority 5:** Longer term priorities e.g. thin to remove the last 10% of conifers on the site – Undertake 5-10 years.

Wherever possible, the approach is about gradual change, in particular the management of light levels, as most threats to remnant ancient woodland features may come from either excessive shade or light. The

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emphasis is not simply on replacing the plantation crop with native trees, and should seldom require rapid or complete removal of non-native conifers. Indeed, depending on the owners' objectives for the site, the report can make recommendations on the potential for growing quality softwood timber through a more semi-natural system of silviculture. Sometimes, circumstances may mean that the most appropriate management is to fell and replant and where this is recommended the report will outline the reasons why.

A precautionary approach should be adopted towards all work on ancient woodland sites. This report attempts to identify as many important, and visible, features as possible. However it is not exhaustive in its scope, and there will likely be additional features found in future. Therefore it is prudent to assume that there may be vulnerable features present within any area of operations, and to therefore proceed with a degree of due caution at all times. An example of this is the importance of woodland soils, and their microbiology. Soils are particularly vital within ancient woodland, and it is crucial that they are considered during woodland management, irrespective of whether any more conspicuous features have been identified above ground.

General guidelines for best practice on ancient woodland sites are as follows:

- Avoid the sudden increase in light levels reaching large diameter deadwood and broadleaved stumps.
- Gently 'halo' thin around mature /ancient or veteran broadleaved trees and avoid excessive thinning and therefore exposure.
- Avoid harvesting machinery tracking across the rooting area of mature /ancient or veteran broadleaved trees and large diameter broadleaved deadwood /stump. Erect temporary fencing and/or hazard tape to protect such areas if at risk.
- Avoid harvesting machinery tracking over areas ancient woodland flora 'hotspots'.
- Avoid creating brash piles on ancient woodland flora 'hotspots'.
- Protect watercourses from damage and diffuse pollution through the creation of log & brash crossing points, brash mats, cut –off trenches and silt traps etc.
- Refuelling locations to be kept away from watercourses and ancient woodland features. Ensure contractor has spillage kits.