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WOODLAND
TRUST

Plas Power Woods

**Management Plan
2013-2018**

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THE WOODLAND TRUST

INTRODUCTION

The Trust's corporate aims and management approach guide the management of all the Trust's properties, and are described on Page 4. These determine basic management policies and methods, which apply to all sites unless specifically stated otherwise. Such policies include free public access; keeping local people informed of major proposed work; the retention of old trees and dead wood; and a desire for management to be as unobtrusive as possible. The Trust also has available Policy Statements covering a variety of woodland management issues.

The Trust's management plans are based on the identification of Key Features for the site and setting objectives for their management. A monitoring programme (not included in this plan) ensures that these objectives are met and any necessary management works are carried out.

Any legally confidential or sensitive species information about this site is not included in this version of the plan.

PLAN REVIEW AND UPDATING

The information presented in this Management plan is held in a database which is continuously being amended and updated on our website. Consequently this printed version may quickly become out of date, particularly in relation to the planned work programme and on-going monitoring observations. Please either consult The Woodland Trust website www.woodlandtrust.org.uk or contact the Woodland Trust (wopsmail@woodlandtrust.org.uk) to confirm details of the current management programme.

There is a formal review of this plan every 5 years and a summary of monitoring results can be obtained on request.

WOODLAND MANAGEMENT APPROACH

The management of our woods is based on our charitable purposes, and is therefore focused on improving woodland biodiversity and increasing peoples' understanding and enjoyment of woodland. Our strategic aims are to:

- Protect native woods, trees and their wildlife for the future
- Work with others to create more native woodlands and places rich in trees
- Inspire everyone to enjoy and value woods and trees

All our sites have a management plan which is freely accessible via our website www.woodlandtrust.org.uk. Our woods are managed to the UK Woodland Assurance Standard (UKWAS) and are certified with the Forest Stewardship Council® (FSC®) under licence FSC-C009406 and through independent audit.

In addition to the guidelines below we have specific guidance and policies on issues of woodland management which we review and update from time to time.

We recognise that all woods are different and that the management of our sites should also reflect their local landscape and where appropriate support local projects and initiatives. Guidelines like these provide a necessary overarching framework to guide the management of our sites but such management also requires decisions based on local circumstances and our Site Manager's intimate knowledge of each site.

The following guidelines help to direct our woodland management:

1. Our woods are managed to maintain their intrinsic key features of value and to reflect those of the surrounding landscape. We intervene when there is evidence that it is necessary to maintain or improve biodiversity and to further the development of more resilient woods and landscapes.
2. We establish new native woodland using both natural regeneration and tree planting, but largely the latter, particularly when there are opportunities for involving people.
3. We provide free public access to woods for quiet, informal recreation and our woods are managed to make them accessible, welcoming and safe.
4. The long term vision for our non-native plantations on ancient woodland sites is to restore them to predominantly native species composition and semi-natural structure, a vision that equally applies to our secondary woods.
5. Existing semi-natural open-ground and freshwater habitats are restored and maintained wherever their management can be sustained and new open ground habitats created where appropriate.
6. The heritage and cultural value of sites is taken into account in our management and, in particular, our ancient trees are retained for as long as possible.
7. Woods can offer the potential to generate income both from the sustainable harvesting of wood products and the delivery of other services. We will therefore consider the potential to generate income from our estate to help support our aims.
8. We work with neighbours, local people, organisations and other stakeholders in developing the management of our woods. We recognise the benefits of local community woodland ownership and management. Where appropriate we allow our woods to be used to support local woodland, conservation, education and access initiatives.
9. We use and offer the estate where appropriate, for the purpose of demonstration, evidence gathering and research associated with the conservation, recreational and sustainable management of woodlands. In particular we will develop and maintain a network of long-term monitoring sites across the estate.
10. Any activities we undertake will conform to sustainable forest management principles, be appropriate for the site and will be balanced with our primary objectives of enhancing the biodiversity and recreational value of our woods and the wider landscapes.

SUMMARY

This public management plan briefly describes the site, specifically mentions information on public access, sets out the long term policy and lists the Key Features which drive management actions. The Key Features are specific to this site - their significance is outlined together with their long (50 year+) and short (5 year) term objectives. The short term objectives are complemented by a detailed Work Programme for the period of this management plan. Detailed compartment descriptions are listed in the appendices which include any major management constraints and designations. A short glossary of technical terms is at the end. The Key Features and general woodland condition of this site are subject to a formal monitoring programme which is maintained in a central database. A summary of monitoring results is available on request.

1.0 SITE DETAILS

Site name:	Plas Power Woods
Location:	Bersham, nr Wrexham
Grid reference:	SJ294497, OS 1:50,000 Sheet No. 117
Area:	42.31 hectares (104.55 acres)
Designations:	Ancient Semi Natural Woodland, Great Landscape Value, Green Barrier Area, Local Nature Site, Planted Ancient Woodland Site, Scheduled Ancient Monument, Special Landscape Area

2.0 SITE DESCRIPTION

2.1 Summary Description

This ancient woodland stretching along the Clywedog Valley is one of the Trust's most popular Welsh sites. It's home to some wonderful wildlife and its diversity of plant species make it a botanist's paradise. What's more, it's packed with historical interest and contains one of the most impressive sections of Offa's Dyke.

2.2 Extended Description

Plas Power and Nant Mill Woods comprise over 50 hectares of woodland, stretching over 2km along the River Clywedog between Coedpoeth and Bersham, Wrexham: Nant Mill Woods lie upstream of Nant Mill itself, Plas Power Woods downstream. Several small tributary streams flow through Nant Mill Woods to the Clywedog.

Together, Plas Power and Nant Mill Woods comprise the largest and least fragmented area of ancient woodland in the Clywedog valley. The vast majority of the woodland is ancient, although much has been replanted with conifers and, locally, with broadleaves, particularly beech and sycamore. The Woodland Trust has undertaken a programme of thinning at the sites as part of a programme of gradual PAWS restoration. Invasive Rhododendron was also once abundant and dense throughout the site, however, its distribution and abundance are now limited after some years of control. Much of the woodland was once part of the Plas Power Park estate.

As well as semi-natural broadleaved woodland, the site supports pockets of grassland, scrub and bracken; these glades have both biodiversity and amenity value.

The wood contains a number of features of historical interest. A section of Offa's Dyke runs across the Clywedog Valley through Plas Power Woods. It is particularly impressive at this point and designated a Scheduled Ancient Monument. Several Listed features are also present: these include Plas Power Park wall, an ornate cast iron Victorian bridge and railings and the recently restored Western Weir (probably constructed around 1750 and still a popular place for local people to meet in summer), with other Listed structures located at the site margins just outside Trust ownership (eg: Nant Bridge, Bersham Lodge, Caeau Weir). The area was also once a hive of industrial activity: other features of historical interest at the site include an 18th century tramway route, ruins of two crofts and a miller's house. The site is also adjacent to the Bersham Ironworks, now a heritage center.

One of The Woodland Trust's most popular sites in Wales, with an estimated 27,000 visit per annum, the woodland offers significant opportunity for walking and quiet informal recreation. Although there are only two short sections of public footpath, there is extensive pedestrian permissive access throughout the site including part of the Clywedog Trail. This is a 9 km long footpath through the Clywedog Valley, Minera to Kings Mill which links features of industrial/archaeological/historical interest along the river corridor. Two way marked trails have now been devolved: The circular family trail via offas dyke and on from here the seasonal loop crosses some stepping stones to a permissive path across farmland back into our woodland. Parking and picnic facilities are available at the adjacent Nant Mill Visitor Centre which is open on restricted weekends. Horse-riding and cycling are permitted along one permissive bridleway to the south of the river, so riders can cut off a narrow road section.

Key features of Plas Power and Nant Mill Woods are:

- Ancient Semi-Natural Woodland (ASNW)
- Plantation on Ancient Woodland Site (PAWS)
- Semi-Natural Open Ground Habitats (Species-rich grassland)
- Historical features
- Informal Public Access

3.0 PUBLIC ACCESS INFORMATION

3.1 Getting there

By bus:

Buses 9, 10 and 11 run from Wrexham along the A525. Buses stop on Coedpoeth High Street, around 1km/0.6 miles from the wood. Follow the brown signs to Nant Mill Visitor Centre. There is also a bus stop outside the Bersham Heritage Centre around 0.7 km/0.4 miles from the eastern end of the site (the opposite end to the Nant Mill Visitor Centre). Walk west under the bypass and along the lane past Bersham Ironworks and Plas Power Chapel (there are no pavements). Opposite the chapel is a kissing gate entrance to the Clywedog Trail. Follow this path over a stepped sluice to the Plas Power entrance.

By train:

The nearest train stations are Wrexham Central (5.5km/3.4 miles) and Wrexham General (5.1km/3.2 miles).

For up-to-date information on public transport, visit traveline.org.uk (telephone 0871 200 22 33) or call Wrexham Busline on 01978 266166.

By car:

From Wrexham, head west on the A525. Turn left onto Rhos Berse Road, where you will find the Nant Mill Visitor Centre and car park, with parking for approximately 30 cars. There are places to lock a small number of bikes although there is no dedicated bike rack. The centre is also on a horse riding route and tether points for two horses have recently been installed.

(January 2017)

3.2 Access / Walks

Nant Mill Wood can be accessed from the Nant Mill Visitor Centre car park. Either cross the footbridge and walk up the lane to an entrance which has a squeeze stile, or follow the surfaced path from the visitor centre grounds to a footbridge across the river with a flight of stone steps.

There is a squeeze stile at the eastern end of the Clywedog Trail. Two other access points along the southern boundary have stiles and lead into the wider public footpath network. Paths can be slippery when wet, and the Clywedog Trail has three footbridges and two flights of steps along its length.

Offa's Dyke family trail (1.5km/0.9 miles)

Look out for the sculpture of King Offa and the special waymark disks designed by local children. The walk takes you through an area once known as the Black Wood, which is now open, light and wildlife-friendly.

Seasonal loop (2km/1.2 miles)

This walk takes you over the stepping stones by the weir, if the water level allows, and through the sections of the wood with the best seasonal colour.

Clywedog Valley Trail (9km/5.6 miles)

The Clywedog Valley Trail passes through Plas Power Woods as it follows the river Clywedog from Minera Lead Mines to King's Mill. The section in Plas Power Woods is surfaced but can be slippery in places when wet. The trail has three footbridges and two flights of steps along its length within Nant Mill Wood.

For further information on the Clywedog Valley Trail visit wrexham.gov.uk/countryside or wrexham.gov.uk/walks.

4.0 LONG TERM POLICY

The long term vision for the woodland is to achieve as natural a state as possible. As the UK's equivalent of rainforest, supporting a wide range of biodiversity, ancient woodland at Plas Power will be protected and enhanced. In fifty years or more, Plas Power and Nant Mill Woods will be a woodland with a semi-natural composition and structure: in other words, mainly comprising native broadleaved trees and shrubs, with varied age structure, a typical ancient woodland ground flora and an abundance of dead wood. The woodland will not be threatened with significant ongoing change as the result of the spread of invasive species (such as Rhododendron and Himalayan balsam), where this can be sustainably prevented: instead, it will support a range of native woodland species.

The primary aim of woodland management will therefore be to restore (or convert) areas of planted woodland, particularly those areas of ancient woodland subsequently planted with conifers, to a semi-natural composition and structure, while safeguarding and enhancing ancient woodland features. Restoration will be achieved through a programme of periodic thinning, gradually removing the majority of the conifers (retaining occasional specimens) and continuing to encourage restocking by natural regeneration. Areas of existing semi-natural woodland and, in the future, restored native woodland, will be managed as high forest.

Within the woodland, existing pockets of other valuable and transitional habitats will be preserved in order to enhance the biodiversity and amenity value of the site. Areas of species-rich grassland within Nant Mill Woods will continue to support a diverse range of typical grassland species, through annual cutting and raking of hay, scrub cutting and coppicing of the woodland edge and will maintain the attractive internal landscape providing variety for visitors and a sense of safety derived from better visibility.

The many historic features of the woodland - many of which are legally protected for the national importance - will also be appropriately maintained and will contribute to the high intrinsic appeal of the woodland to visitors.. Existing mature trees will be retained but regeneration and scrub will be removed to improve the visibility of Offa's Dyke and reduce future risk of damage due to root growth.

The existing public and permissive paths, and links to the local footpath network, will be maintained and enhanced to encourage continued extensive public use of the site. Opportunities will be taken to improve the visitor experience and to facilitate appropriate use of the site by local groups for healthy, informal recreation. Misuse will be controlled as far as possible.

The woodland will be managed as semi-natural high forest with low key intervention to reduce excessively dense canopy shading, promote stability and retain a desirable balance between site-native species and non-site-native species (beech and sycamore). Intervention will be through thinning (felling to waste and/or ring-barking) of young and semi-mature beech and sycamore (especially in dense stands of these species), retaining site-native tree and shrub species and all large mature trees (including beech and sycamore).

Areas of species-rich grassland will be managed to maintain the sward diversity, for example through annual hay cutting (removing cuttings).

To maintain the attractive internal landscape at the site, the majority of the glades will be kept open through periodical clearance of invasive scrub and annual cutting, though scrub will be permitted to develop in selected areas such as steeper bracken-dominated slopes and adjacent to the southern public footpath. Around the glades, scrubby open woodland edge habitat will be encouraged through regular coppicing of the woodland margin.

The public and permissive paths, and links to the local footpath network, will be maintained to enable continued extensive public use of the site.

5.0 KEY FEATURES

The Key Features of the site are identified and described below. They encapsulate what is important about the site. The short and long-term objectives are stated and any management necessary to maintain and improve the Key Feature.

5.1 Ancient Semi Natural Woodland

Description

Relatively small parts of the site support semi-natural woodland, much of which is ancient. Mature ash is generally dominant (locally thinned) with beech, sycamore, oak and wych elm each locally frequent. Large over-mature trees are locally frequent. The shrub layer is often well developed and diverse comprising hazel, aspen, sycamore, beech, holly and ash. Rhododendron (formerly locally frequent) has generally been cleared. The field layer is often diverse though usually dominated by bramble. Other frequent/locally frequent species include herb robert, yellow archangel, male-fern, hedge woundwort, ransoms, hart's tongue-fern, wood anemone, sweet woodruff, wood speedwell, wood sedge, enchanter's nightshade, greater wood-rush, dog's mercury, false wood-brome, wood fescue, bluebell, wood avens, common nettle, soft-rush and honeysuckle (W8e/f NVC sub-communities). Flushed areas and the river side support alder, tufted hair-grass, lesser celandine, wild angelica and opposite-leaved golden-saxifrage (W7 NVC community).

An area to the south-west of the site supports wet woodland dominated by mature crack willow and alder (much fallen) with areas of standing water (shaded pools). Common nettle, meadowsweet, marsh marigold, creeping buttercup, floating sweet-grass, water mint and bittersweet are common here (W6c NVC sub-community).

The river complements the semi-natural woodland, providing habitat for a number of birds such as dipper, invertebrates and fish including bullhead.

Significance

The woodland is semi-natural and mainly ancient semi-natural. Ancient woodland is the UK's richest habitat for wildlife, the result of centuries of continuous woodland conditions and management. Areas of upland mixed ashwood and wet woodland are present, priority habitat types in the UK BAP. The woodland and woodland margins are also likely to be of value to a range of fauna groups such as bats and possibly otters.

Opportunities & Constraints

Bats - European protected species - are known to frequent the site. The larger over-mature trees may be of value as potential roost sites. Otters may also be present along the Clywedog.

Several features of significant and local archaeological/historical interest are present and some have a measure of legal protection.

The woodland is an important component of the landscape in a well-visited section of the Clywedog Valley. Therefore any management should take into account the appearance of the woodland and, to the east of the site, the Conservation Area designation.

Natural regeneration will ensure the continuity of woodland at the site.

Although much Rhododendron has been cleared, the species remains present and further control will be required in the future. Japanese knotweed is present at a number of locations and is likely to spread at the site if not controlled. Other potentially invasive non-native species include Himalayan balsam, periwinkle, Oregon grape and a non-native dogwood.

The potential for badger presence should be considered when planning operations.

Factors Causing Change

Natural regeneration is locally frequent and will be sufficient to ensure the future continuity of the woodland. Localised tipping may lead to the spread of invasive non-native species. Rhododendron remains present and is likely to spread/re-invade if not kept under control. Conifer regeneration may spread from neighbouring planted areas., Fire setting can damage trees and ground flora.

Long term Objective (50 years+)

As the areas of plantation are restored, the area of semi-natural broadleaved woodland, much of it ancient in origin, will increase. This woodland will be composed largely of tree species native to the area. There will be many mature and veteran trees. The shrub layer will be diverse and well developed, consisting largely of site-native shrubs and young trees. The field layer will be diverse and characteristic of upland mixed ashwood, wet woodland and upland oakwood habitat types. The quantity of deadwood will increase.

Short term management Objectives for the plan period (5 years)

Fallen and standing deadwood will be left in situ wherever it does not present an unacceptable risk. There will be at least 1m³ of deadwood present with the ASNW areas at all times.

There will be no increase in the presence of Rhododendron and other invasive non-native species (including conifer regen) as a result of a programme of control. This will be monitored during annual assessment visits.

There will be an active programme in liaison with Wrexham County Borough Council aimed at discouraging tipping and other potentially damaging activities. Significant incidents will be recorded in the Site Diary and RA database and their frequency reviewed at least twice during the plan period.

5.2 Planted Ancient Woodland Site

Description

The majority of the site has been replanted/planted with conifers, beech and sycamore, mainly around 1960 but with some areas planted more recently. A thinning programme undertaken by the Trust during the period 1996-2010 has substantially reduced the cover of conifers so that the woodland is now very variable with small areas of dense un-thinned conifers, areas dominated by thinned conifers with a greater proportion of broadleaves, areas with a mixed canopy and patches dominated by broadleaves (mainly ash, oak, sycamore and beech with occasional to locally frequent silver birch, wild cherry and rowan) with only scattered conifers remaining. Areas dominated by beech and sycamore plantation are also present, mainly to the east of the site. Occasional large over-mature beech and oak are present, especially near the river and at the northern end of the site where large widely spaced oak is locally dominant. The many large stumps (mainly oak) which are also present are of interest as a remnant of the former ancient woodland cover. Occasional large mature conifer specimens are also of note (mainly Douglas fir and larch).

Rhododendron which was formerly widespread has been largely cleared, but remains in inaccessible areas and as scattered individuals and re-growth. Other shrubs are often sparse or absent but holly and hazel and young ash, beech and sycamore are locally frequent.

Bare ground is often prominent, for example under remaining dense stands of conifers and where dense Rhododendron has only recently been cleared. Elsewhere the field layer often comprises bramble, bluebell, broad buckler-fern, creeping soft-grass, bracken, wood sorrel, wood anemone, greater wood-rush, ivy, honeysuckle, tufted hair-grass and rosebay willowherb (W10e NVC sub-community). Locally the flora is more diverse including many of the above species plus dog's mercury, wood sedge, pendulous sedge, ransoms, hart's-tongue fern, enchanters nightshade, wood speedwell, wood avens, sweet woodruff, cleavers, common nettle, yellow pimpernel and yellow archangel. (W8e/f NVC sub-communities).

Significance

The replanted woodland is mainly ancient (PAWS). Restoration of such woodland to semi-natural broadleaved woodland presents a significant opportunity for biodiversity enhancement. Resulting restored habitats (e.g. upland oakwood and upland mixed ashwood) are priority habitat types in the UK BAP.

The woodland and woodland margins are also likely to be of value to a range of fauna groups such as bats and possibly otter.

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Opportunities & Constraints

Restoration of PAWS present significant opportunity to increase biodiversity. At present, levels of shade, particularly under denser conifer stands, threaten AWI flora and in some places existing broadleaves (although at present most pre-crop trees have been haloed). However, too drastic an intervention would be likely to increase competition from coarse vegetation. Natural regeneration is abundant where light levels are sufficient and should be adequate to ensure the continuity of woodland at the site without planting.

Several features of significant and local archaeological/historical interest are present and some have a measure of legal protection. Care will be required during management not to damage these features, or the old oak stumps. The main path/track through the site is thought to be of possible historical interest and therefore cannot be used as a main extraction track, although the track in 7A would provide an opportunity to render thinning in this area more economic.

Although much *Rhododendron* has been cleared, the species remains present and further control will be required in the future to prevent reinvasion, as it tends to significantly inhibit native ground flora and understorey. Japanese knotweed is present at a number of locations and is likely to spread at the site if not controlled. Other potentially invasive non-native species include periwinkle, Himalayan balsam, Oregon grape and a non-native dogwood.

Bats - European protected species - are known to frequent the site. The larger over-mature trees may be of value as potential roost sites. Otters may also be present along the Clywedog.

There are opportunities to retain a number of impressive mature conifer specimens of species unlikely to generate significant regen. The woodland is an important component of the landscape in a well-visited section of the Clywedog Valley. Therefore any management should take into account the appearance of the woodland and, to the east of the site, the Conservation Area designation.

Factors Causing Change

Natural regeneration (mainly ash with beech, sycamore and silver birch) is locally frequent and will be sufficient to ensure the future continuity of the woodland., Several non-native invasive species present and likely to spread/re-establish if not kept under control - including *Rhododendron*, Japanese knotweed, periwinkle, snowberry and a non-native dogwood., Conifer regen, particularly Western hemlock, is frequent and will require management

Long term Objective (50 years+)

PAWS restoration presents a significant opportunity for woodland biodiversity gains. In the long term, all remnant AW components will be restored: in other words, all remnant AW features will be secure and improving in condition. These areas will develop into diverse woodland, with a structure and composition similar to semi-natural broadleaved woodland, with only scattered conifers (including retained mature specimens). There will be many mature and veteran trees. The shrub layer will be diverse and well developed, consisting largely of site-native shrubs and young trees. The field layer will be diverse and characteristic of upland mixed ashwood, wet woodland and upland oakwood habitat types. There will be an abundance of standing and fallen deadwood .

The restoration will be achieved through a programme of successive thinning (every 10-15 years), systematically reducing the cover of conifers (whilst retaining occasional specimen non-native trees). Periodic cleaning of natural regeneration will also be undertaken to favour locally native species.

Short term management Objectives for the plan period (5 years)

The PAWS assessment review undertaken in 2016 should show stability or improvement in the condition of all remnant AW features as compared to the findings in 2011. Natural regeneration of site-native broadleaves should be frequent within most planted compartments.

There will be no increase in the presence of Rhododendron and other invasive non-native species (including conifer regen) across the whole site as a result of a programme of control. This will be monitored during annual assessment visits.

By 2016, a further round of thinning and/or the removal of hemlock regen as per PAWS assessment will have been completed in PAWS zones 2,3,4,5,6,8,14,15,16,18 & 19.

5.3 Informal Public Access

Description

The site is among the Woodland Trust's flagship sites in Wales, due in part to its level of use by the public. A visitor survey in 2004 suggested that the site attracted 27,000 visits per annum with walking as a primary activity, often with dogs. The site is high priority for the WoodlandTrust for investment in the visitor experience.

Although there are only two sections of public footpath on site, there is extensive pedestrian permissive access throughout the site, the most heavily used path being the riverside Clywedog Trail - a nine mile long footpath through the Clywedog Valley which is promoted by the local authority and which links features of industrial/ archaeological/ historical interest. Horse-riding and cycling are permitted along the path to the south of the river (sub-compartment 6A) and pedestrian access has been further enhanced with the creation of a permissive path on neighbouring land to the south of the river to link with sub-compartments 6A and 6C.

Parking and picnic facilities are available at the adjacent Nant Mill Visitor Centre which has developed a number of local self-guided walks, one of which is based on Plas Power Wood. Two information boards are provided, at the main entrance and at Offa's Dyke. Wrexham rangers use Plas Power Woods as part of educational visits and encourage visitors to use the woods, however, many visitors to Nant Mill may not leave the grounds and explore further afield. Funding enabled a Forest School enterprise to betemporarily trialled on the site in 2004.

A number of features at the site are of particular interest to the public and, together with views to the river and path side glades, contribute to the sites high intrinsic appeal. These include the Offa's Dyke, a number of features of significant historical interest (both those listed above and several features which occur on adjacent land such as the Nant Bridge and Caeau Weir), a number of other historical features including estate railings, a section of mortared wall along Bersham Road (not Listed), ruins associated with a former miller's house (Nant Mill) and a croft, winter views across to the former Plas Power Park and Wrexham and the small area of open habitat and waterfall adjacent to Offa's Dyke.

The site also has a value to locals, particularly young people, who often walk to the site (often from disadvantaged areas in the centre of Wrexham) and tend to congregate in the vicinity of the weir in the summer months to swim in the Clywedog.

Unfortunately, attendant on this usage there have been incidents of anti-social behaviour and some undesirable activity such as un-regulated fire-setting, vandalism, and overnight camping associated with alcohol consumption and littering. Cycling/ mountain-biking and horse-riding on pedestrian paths also occur to a disappointing degree, despite signage and notices erected by the council. These activities may affect many visitors' enjoyment of the woodland.

Flytipping is a pernicious problem, particularly along the road from Berhsam to Nant Mill and at the management access in compartment 7A.

Significance

Plas Power and Nant Mill Woods are situated 2 miles to the west of Wrexham and feature in two trails promoted by the Local Authority - the Clywedog Trail and a more local trail connected with the adjacent Nant Mill Visitor Centre. The site is of particular historical interest and has high intrinsic appeal: the number of visitors continues to increase, particularly during the summer months. The woods are amongst the best visited of the Woodland Trust's properties in Wales and as such the woodland is classed as high priority for The Trust.

Opportunities & Constraints

The majority of the main permissive path (Clywedog Trail) through Plas Power Woods has been surfaced and is maintained in good condition. However, at the eastern end of Plas Power and in Nant Mill Wood, the path is not surfaced and can become muddy in wet conditions. In places the path-side is subject to intrusion from landslip or water damage, such as near Offa's Dyke.

There are opportunities to improve the provision of circular routes in addition to the Clywedog trail and to improve the access across the river in the vicinity of the weir: however, the water rises significantly in heavy rain and previous attempts to bridge the have been thwarted by floods. There is also the potential to collaborate with the neighbouring landowner who has created a permissive trail linking two entrances to the woodland.

Horse-riding is accepted on the path through sub-compartment 6a and as a result this path can become puddled and muddy.

During thinning operations, there will be opportunities to maintain and enhance views from the Clywedog Trail to the river and the many features of interest which occur along it. There will also be opportunities to create a variety of path conditions to diversify the visitors' woodland experience, maintaining some open sunny paths and allowing other paths to develop a closed canopy.

Recent improvements to the management access in 7A should help to reduce flytipping, however, this continues to be an issue.

The site is attractive to third parties for educational activities and its location near to Nant Mill/ Bershaw Ironworks presents obvious potential for partnership working with Wrexham County Borough Council and others. With significant interest in Forest School and the inclusion of outdoor learning in the Welsh curriculum there is potential for increasing the usage and educational value of the site. People engagement projects locally might also be able to be tailored to counteract some of the anti-social behaviour experienced on site.

The majority of the main permissive path (Clywedog Trail) through Plas Power Woods has been surfaced and is maintained in good condition. However, at the eastern end of Plas Power and in Nant Mill Wood, the path is not surfaced and can become muddy in wet conditions. In places the path-side is subject to intrusion from landslip or water damage, such as near Offa's Dyke: there are opportunities to improve this if funding were to be available.

There are opportunities to improve the provision of circular routes in addition to the Clywedog trail and to improve the access across the river in the vicinity of the weir: however, the water rises significantly in heavy rain and previous attempts to bridge the have been thwarted by floods (e.g. October 2000). There is also the potential to collaborate with the neighbouring landowner who has created a permissive trail linking two entrances to the woodland. Such improvements would be subject to funding.

Horse-riding is accepted on the path through sub-compartment 6a and as a result this path can become puddled and muddy.

Factors Causing Change

Degradation of paths/ entrances/ river crossings through action of weather, water and high levels of usage, Natural succession To Woodland will increase shade and reduce visibility from viewpoints if not managed, Unauthorised /illegal activities reducing enjoyment of site by visitors, Availability of funding for improvements, Recreational patterns of local population and competition from other 'attractions'

Long term Objective (50 years+)

Increasing numbers of visitors will come to Plas Power for quiet enjoyment and recreation. The path network, site furniture and on-site interpretation will be maintained and enhanced to accommodate this increased usage, where this is compatible with the conservation interest at the site. There will be a high level of interest, understanding and engagement among the local community, with a concurrent decline in undesirable activities. Groups will feel confident in using the site for the purposes of exercise and formal and informal education.

Short term management Objectives for the plan period (5 years)

By 2014, visitor numbers will have doubled from those recorded in 2011-12 (based on data from footfall counters installed in 2011 and monitored quarterly).

During this plan period, funding will be secured to improve at least 800m of the path network and the circular route crossing the River Clywedog in Plas Power woods will be reinstated.

Over the life of the Plas Power Visitor Improvement Project, at least 12 events, 12 talks and 12 guided walks will take place, benefitting at least 360 attendees. We will also engage with at least 6 external groups or organisations.

Records of undesirable activity and damage will be recorded in the site diary and their incidence reviewed annually.

5.4 Historic Features

Description

Offa's Dyke passes through the site, running north-south on either side of the river. The section of the Dyke within Plas Power Woods is one of the most impressive and well preserved sections along the entire length of the structure and is designated a Scheduled Ancient Monument. It comprises a large bank (up to 2m high), with a wide ditch on its western side to the north of the site.

To the north of the river, the Dyke supports scattered mature large pedunculate oak (and occasional beech and ash). Shrubs and younger trees were mainly cleared in 1995 but regrowth/regeneration has been vigorous and the dyke still supports dense patches of rhododendron, holly, wych elm, sycamore, ash and rowan with local western hemlock regeneration.

To the south of the river, the dyke supports relatively dense semi-mature to mature broadleaved woodland with a mix of canopy species (sycamore, beech, oak, ash, silver birch) and a dense shrub layer comprising holly, hazel, hawthorn, rowan and young canopy species. Much of the ground layer is bare but bramble is locally abundant and other species present include male-fern, great wood-rush, ivy, bluebell, bracken and ransoms.

The Grade II Listed bridge adjacent to Bersham Lodge was built during the 1860s (as part of a remodelling of Plas Power Park) and is a fine example of decorative cast-iron work with Gothic iron ballustrading, twisted rails and trefoiled heads and hollow cast outer piers with fleur-de-lis and quatrefoil enrichment. Specimen yew trees are situated on either side on the Trust's property. The railings running along the Woodland Trust's boundary are also an important landscape feature (although they are not Listed).

"Big Wood Weir" or the "Western Weir" is a high, vertical, stone-faced weir on a slight curve. It is a Listed structure and was probably built in the mid 18th century by the Bersham Ironmasters, the Wilkinsons, to divert water into a leat to carry water to a coal mine across the Bersham to Minera road. 'Caeau Weir' is located at the site entrance at the Bersham end as is also Listed, but is not situated on Woodland Trust property.

The wall to Plas Power Park (on the north-western boundary of sub-compartment 2A) is also Listed and formed the western boundary to Plas Power Park. It is composed of rusticated rock-faced rubble with rustic projecting castellations and is of variable height. It was integral to the mid-19th century landscaping of the Park.

Significance

The dyke is designated a Scheduled Ancient Monument and as such is considered to be of national importance. The feature is also visually impressive and contributes to the intrinsic appeal of the wood to visitors.

Listed Structures are considered to be historical/archaeological features of national importance. These features are also important in shaping the character and distinctiveness of the wood.

Opportunities & Constraints

There is an opportunity to open up the dyke through the removal of coarse vegetation, young scrub and trees. This would improve the visibility of this impressive section of dyke whilst reducing the risk of future root damage. However, regrowth and regeneration is rapid and scrub control is likely to be required on a regular basis. Windblow is a potential threat to the archaeology where mature trees are present on the upper levels of the Dyke, however, this must be balanced with the value of the mature trees in their own right.

The existence of paths crossing the Dyke may present an erosion risk in the long term and all works impacting on the monument will need to be agreed with CADW.

The Listed wall is in good condition, however, damage from vegetation, vehicle impact and stone theft are factors which may impact on the feature. During the last plan period, substantial investment was made to repair and renovate Big Wood Weir and the Bersham Lodge railings: ongoing inspection and maintenance of the railings will be required every few years.

Some of the ballustrading lies within the Trust boundary. The bridge is outside Trust ownership but the Trust has rights to use and repair/maintain this river crossing. A proposal to repair and open this bridge to the public (for views along the river) was previously explored but not progressed. Management of all Listed Structures requires consultation with the Local Authority.

Factors Causing Change

Growth of trees, scrub and ivy on Scheduled and Listed features, Windblow, Erosion along official and desire line paths, Animal activity (badgers), Deterioration of built structures over time as a result of the action of weather and water, Accidental damage (e.g. vehicle strike)

Long term Objective (50 years+)

The Dyke is a feature of national importance which enhances the intrinsic appeal of the site. It will remain a visible feature, not excessively obscured by scrub and appropriately interpreted, for the benefit of the public. Vistas across the surrounding landscape will remain open all year round at key points.

The management regime for the Dyke will be discussed and agreed with CADW as the relevant statutory authority with the intention of protecting the underlying archaeology. The stability of mature trees which have the potential to cause damage in the event of windblow will be assessed and the number of mature trees on the Dyke will decline in the long term (50 years or more) as they cease to be replaced by regenerating trees and scrub thanks to a programme of control. However, veteran trees will be retained wherever possible as a heritage feature in their own right.

All listed structures will be maintained in satisfactory condition in consultation with the Local Authority, and no Listed structures will be on the 'At Risk' register.

Short term management Objectives for the plan period (5 years)

At least two viewpoints along the most impressive sections of the Dyke will be opened up during this plan period by means of scrub coppicing. The area of the Dyke visible from the Clywedog trail will also be kept clear so as to be easily visible. The missing interpretation panel will be replaced.

Ideally, there will be no instances of windblow causing damage to the archaeology. Mature trees along the Dyke will be monitored biennially and action taken if root plate movement identified.

A detailed maintenance programme for the recently restored railings will be undertaken (see consultant engineer's recommendations).

Other Listed features will be subject to regular inspection for signs of deterioration or damage and remedial action taken where necessary (in particular to prevent damage from vegetation growth along the Listed boundary walls).

5.5 Semi Natural Open Ground Habitat

Description

Several glades are present, two of which support areas of species-rich (though relatively rank) grassland with over 60 plant species recorded.

The northern of the areas of species-rich grassland runs along the River Clwydog to the north of the site, supporting a high diversity of species including bird's-foot-trefoil, bulbous and meadow buttercups, crosswort, common knapweed, meadow vetchling, bitter-vetch and meadowsweet. However, rank grasses (cock's-foot, Yorkshire-fog) and tall herbs (broadleaved dock, cow-parsley, hogweed) are locally frequent/abundant.

The southern area lies central to the site and supports areas of marshy grassland and species-rich dry grassland. Other species present include bitter-vetch, common knapweed, common spotted-orchid, common sorrel, devil's-bit scabious, lady's-mantle, wild angelica, greater bird's-foot-trefoil, meadow vetchling, meadowsweet and tormentil.

Significance

Areas of species-rich grassland contribute significantly to the biodiversity of the site with over 60 plant species recorded in this habitat. The habitat is also likely to be of value to a range of invertebrate species. The grassland is also of high intrinsic appeal.

Opportunities & Constraints

Bracken, once abundant in the southern area of species-rich grassland, is still present on the upper margins and may expand into the grassland again in the future.

Tall herbs are locally abundant in the northern area and may require specific control if considered to be a threat to sward diversity in the future. There is an opportunity to enhance the sward through appropriate management.

The adjacent woodland is shading the open habitat and the shading effect will increase as the woodland matures.

There is evidence that woodland has encroached on the grassland relatively recently in some places (for example common spotted orchid is frequent in the woodland immediately adjacent to the southern area of species-rich grassland). There is an opportunity to create a scrubby woodland/grassland interface through opportunistic coppicing of woodland at the grassland margin.

Factors Causing Change

Rank grasses and tall herbs are locally frequent/abundant throughout the habitat, perhaps reflecting a lack of appropriate management in the past., In the absence of management the sward diversity would decline, with rank grasses and tall herbs dominating., Scrub and bracken are invading locally.

Long term Objective (50 years+)

Two areas (total area at least 0.5ha) of species-rich grassland supporting a high number of species indicative of unimproved grassland with reduced dominance of rank grasses such as cock's-foot and Yorkshire-fog, tall herbs such as broadleaved dock and cow parsley and bracken. Grassland margins will comprise low scrubby woodland edge which reduces shading and provides a valuable woodland/grassland interface.

Annual grassland management will be required (hay cutting). Control of certain tall herbs, bracken and scrub (cutting and treating cut stumps) may be desirable/necessary if hay cutting alone does not limit their spread/dominance.

A scrubby woodland edge will be created and maintained through regular coppicing of the woodland at the grassland margins.

Short term management Objectives for the plan period (5 years)

Annual mowing of the two areas of species-rich grassland, with cuttings removed (ideally following a 1-2 day period to allow seeds to fall from the hay).

A narrow margin of woodland adjacent to the grassland will be coppiced within 5 years (to reduce shading and prevent further invasion of the grassland habitat). Scrub, bracken and tall herbs will be monitored and controlled as necessary to ensure these do not impact negatively on the grassland swards.

6.0 WORK PROGRAMME

Year	Type of Work	Description	Due By
2014	WMM - Invasive Plant Control	Inspect Clywedog / known hotspots for knotweed. If found, treat with glyphosate (subject to appropriate consents obtained by the Site Manager).	28/08/14
2015	WMM - Invasive Plant Control	Inspect Clywedog / known hotspots for knotweed. If found, treat with glyphosate (subject to appropriate consents obtained by the Site Manager).	28/08/15
2016	WMM - Invasive Plant Control	Inspect Clywedog / known hotspots for knotweed. If found, treat with glyphosate (subject to appropriate consents obtained by the Site Manager).	31/10/16
2017	WMM - Invasive Plant Control	Inspect Clywedog / known hotspots for knotweed. If found, treat with glyphosate (subject to appropriate consents obtained by the Site Manager).	28/08/17
2018	LC - Routine Litter Picks	Cleansing / safety checks visit: sweep site and remove litter and flytipping. Undertake inspection of all footbridges and railings in Plas Power and check safety fencing above Weir. Monthly reporting spreadsheet must include a written record of safety che	31/01/18
2018	LC - Routine Litter Picks	Cleansing / safety checks visit: sweep site and remove litter and flytipping. Undertake inspection of all footbridges and railings in Plas Power and check safety fencing above Weir. Monthly reporting spreadsheet must include a written record of safety che	31/01/18
2018	SL - Tree Safety Emergency Work	Clear up trees down over path	30/03/18
2018	LC - Fly Tipping	Clear up of fly tipping over the wall	30/03/18
2018	AW - Visitor Access Maintenance	Fix of boardwalk next to Russian Steps Weir	30/03/18
2018	SL - Tree Safety Emergency Work	Clear up trees down over path	30/03/18
2018	LC - Fly Tipping	Clear up of fly tipping over the wall	30/03/18

2018	AW - Visitor Access Maintenance	Fix of boardwalk next to Russian Steps Weir	30/03/18
2018	PE - Events - General	Clywedog Trail Posters	16/04/18
2018	LC - Routine Litter Picks	Cleansing / safety checks visit: sweep site and remove litter and flytipping. Undertake inspection of all footbridges and railings in Plas Power and check safety fencing above Weir. Monthly reporting spreadsheet must include a written record of safety che	22/04/18
2018	LC - Routine Litter Picks	Cleansing / safety checks visit: sweep site and remove litter and flytipping. Undertake inspection of all footbridges and railings in Plas Power and check safety fencing above Weir. Monthly reporting spreadsheet must include a written record of safety che	22/04/18
2018	LC - Routine Litter Picks	Cleansing / safety checks visit: sweep site and remove litter and flytipping. Undertake inspection of all footbridges and railings in Plas Power and check safety fencing above Weir. Monthly reporting spreadsheet must include a written record of safety che	25/04/18
2018	LC - Routine Litter Picks	Cleansing / safety checks visit: sweep site and remove litter and flytipping. Undertake inspection of all footbridges and railings in Plas Power and check safety fencing above Weir. Monthly reporting spreadsheet must include a written record of safety che	29/04/18
2018	LC - Routine Litter Picks	Cleansing / safety checks visit: sweep site and remove litter and flytipping. Undertake inspection of all footbridges and railings in Plas Power and check safety fencing above Weir. Monthly reporting spreadsheet must include a written record of safety che	02/05/18
2018	SL - Tree Safety Emergency Work	Clearance of fallen tree over Clywedog trail and repairs to the maze	07/05/18
2018	HF - Grazing	Repairs to Nant Mill fencing	07/05/18
2018	PE - Events - General	Leading Lanterns Poster 100x A4 10x A3 Water resistant paper	18/05/18

2018	PE - Events - General	Plas Power Woods Heritage Crafts Poster 100x A4 10x A3 Water resistant paper	18/05/18
2018	PE - Events - General	152 words @ £65/1000 - Clywedog Trail	20/05/18
2018	PE - Events - Contractor/Provider	939 words @ £65/1000 - Heritage Crafts	20/05/18
2018	PE - Events - Contractor/Provider	548 words @ £65/1000 - Leading Lanterns	20/05/18
2018	PE - Events - General	Clywedog Trail 20th May - Woodcraft activity for children, refreshments for walkers	20/05/18
2018	LC - Routine Litter Picks	Cleansing / safety checks visit: sweep site and remove litter and flytipping. Undertake inspection of all footbridges and railings in Plas Power and check safety fencing above Weir. Monthly reporting spreadsheet must include a written record of safety che	27/05/18
2018	LC - Routine Litter Picks	Cleansing / safety checks visit: sweep site and remove litter and flytipping. Undertake inspection of all footbridges and railings in Plas Power and check safety fencing above Weir. Monthly reporting spreadsheet must include a written record of safety che	31/05/18
2018	LC - Routine Litter Picks	Cleansing / safety checks visit: sweep site and remove litter and flytipping. Undertake inspection of all footbridges and railings in Plas Power and check safety fencing above Weir. Monthly reporting spreadsheet must include a written record of safety che	03/06/18
2018	PE - Events - General	New design and photo Clywedog Trail mugs x300 = £605 +VAT + artwork charge : £45 + VAT 300x colour mugs.	15/06/18

2018	LC - Routine Litter Picks	Cleansing / safety checks visit: sweep site and remove litter and flytipping. Undertake inspection of all footbridges and railings in Plas Power and check safety fencing above Weir. Monthly reporting spreadsheet must include a written record of safety che	17/06/18
2018	LC - Routine Litter Picks	Cleansing / safety checks visit: sweep site and remove litter and flytipping. Undertake inspection of all footbridges and railings in Plas Power and check safety fencing above Weir. Monthly reporting spreadsheet must include a written record of safety che	24/06/18
2018	AW - Visitor Access Maintenance	1st path and entrance maintenance	26/06/18
2018	LC - Routine Litter Picks	Clearance of litter from Clywedog - 1st visit	26/06/18
2018	AW - Visitor Access Maintenance	Path and entrance maintenance - 1st visit (Nant Mill Woods)	26/06/18
2018	LC - Routine Litter Picks	Cleansing / safety checks visit: sweep site and remove litter and flytipping. Undertake inspection of all footbridges and railings in Plas Power and check safety fencing above Weir. Monthly reporting spreadsheet must include a written record of safety che	26/06/18
2018	PE - Events - General	Clywedog Trail: £800 Amounts deducted: £500 - Tim Kirwin - Clywedog Trail Activities £115 - Clywedog Trail Posters £100 - Phoenix Transport - Shuttle Bus £9.88 - Afaith - Translation 75.12 left RG Zeroed this end of May after event	29/06/18
2018	PE - Events - Contractor/Provider	Rent of space to place a storage unit in Nant Mill as detailed in letter 31st March 2017 (years fee) Container (as detailed in email 22/09/16), delivery and installation.	30/06/18

2018	PE - Events - General	Heritage Crafts £1242.22 Amounts deducted: £620 - Woodland Classroom - Charcoal, campfire crafts and resources - additional £40 will be invoiced for charcoal purchased due to cancellation of fires. £160 - Dwd - Poster £61.04 - Afaith - Translation £150 - Green Woodcraft £86.20 - Wrexham CC - Education Room £80.00 - Heather Parry Williams - Assistant £44.98 claimed through Kirsten's expenses referencing source code W18PLAW01	21/07/18
2018	PE - Events - General	Activities for Plas Power's Heritage Crafts event - Charcoal and Campfire Crafts - £560 Resources - £60	21/07/18
2018	PE - Events - General	Heritage Crafts Activity - Green Woodwork	21/07/18
2018	PE - Events - General	Hire of Education Room	21/07/18
2018	PE - Events - General	Event Assistant - helping event manager at different points during the event	21/07/18
2018	SL - Tree Safety Works - Zone B	To Fell ash tree as discussed and install as squeeze post £200.00 + VAT	31/07/18
2018	WMM - Invasive Plant Control	One visits to sweep site, particularly the river corridor, and pull any Himalayan Balsam found.	31/07/18
2018	AW - Visitor Access Maintenance	2nd path and entrance maintenance	31/07/18
2018	AW - Visitor Access Maintenance	Cut and rake glade near Nant Mill itself. Time before seeding of Hogweed. Dried cuttings may be left on site where nutrients unlikely to drain and not close to paths. Include cutting of bracken on slope.	31/07/18
2018	HF - Protection / Maintenance	Strimming and brush cutting of bramble on Offa's Dyke (area visible from Clywedog trail)	31/07/18

2018	LC - Routine Litter Picks	Cleansing / safety checks visit: sweep site and remove litter and flytipping. Undertake inspection of all footbridges and railings in Plas Power and check safety fencing above Weir. Monthly reporting spreadsheet must include a written record of safety che	31/07/18
2018	LC - Routine Litter Picks	Cleansing / safety checks visit: sweep site and remove litter and flytipping. Undertake inspection of all footbridges and railings in Plas Power and check safety fencing above Weir. Monthly reporting spreadsheet must include a written record of safety che	05/08/18
2018	LC - Routine Litter Picks	Cleansing / safety checks visit: sweep site and remove litter and flytipping. Undertake inspection of all footbridges and railings in Plas Power and check safety fencing above Weir. Monthly reporting spreadsheet must include a written record of safety che	12/08/18
2018	LC - Routine Litter Picks	Cleansing / safety checks visit: sweep site and remove litter and flytipping. Undertake inspection of all footbridges and railings in Plas Power and check safety fencing above Weir. Monthly reporting spreadsheet must include a written record of safety che	19/08/18
2018	LC - Routine Litter Picks	Cleansing / safety checks visit: sweep site and remove litter and flytipping. Undertake inspection of all footbridges and railings in Plas Power and check safety fencing above Weir. Monthly reporting spreadsheet must include a written record of safety che	26/08/18
2018	AW - Visitor Access Maintenance	Cut meadow areas: species-rich grassland areas to NW of Nant Mill Woods, to be cut and raked, cuttings to be removed from site.	28/08/18
2018	WMM - Invasive Plant Control	Inspect Clywedog / known hotspots for knotweed. If found, treat with glyphosate (subject to appropriate consents obtained by the Site Manager).	28/08/18
2018	AW - Visitor Access Maintenance	3rd path and entrance maintenance	28/08/18

2018	AW - Visitor Access Maintenance	Path and entrance maintenance - 2nd visit (Nant Mill Woods)	28/08/18
2018	LC - Routine Litter Picks	Clearance of litter from Clywedog - 2nd visit	30/08/18
2018	PE - Events - General	New design and photo Clywedog Trail mugs 300x colour mugs. £650 - Design and delivery of mugs £150 KM Zeroed	31/08/18
2018	AW - Visitor Access Infrastructure	Poster board fro new entrance way	31/08/18
2018	LC - Routine Litter Picks	Cleansing / safety checks visit: sweep site and remove litter and flytipping. Undertake inspection of all footbridges and railings in Plas Power and check safety fencing above Weir. Monthly reporting spreadsheet must include a written record of safety che	02/09/18
2018	PE - Events - General	Lantern Making Kit - Willow, paper, tape Including delivery	27/09/18
2018	HF - Protection / Maintenance	Clear any build up of leaves and other debris from top of restored weir	30/09/18
2018	PE - Events - General	Lantern Making, Lanterns for route lighting and Fireside Refreshments	13/10/18
2018	PE - Events - General	Hire of Educaton Room for Leading Lanterns Event	13/10/18

APPENDIX 1: COMPARTMENT DESCRIPTIONS

Cpt No.	Area (ha)	Main Species	Year	Management Regime	Major Management Constraints	Key Features Present	Designations
1a	19.48	Ash	1930	High forest	Archaeological features, No/poor vehicular access to the site, Sensitive habitats/species on or adjacent to site, Very steep slope/cliff/quarry/mine shafts/sink holes etc	Semi Natural Open Ground Habitat	Ancient Semi Natural Woodland, Special Landscape Area
<p>This compartment comprises all woodland in Woodland Trust ownership to the west and south of the Nant Mill Visitor Centre and the River Clywedog. While not confirmed as ancient, this area of semi-natural broadleaved woodland will be essentially treated as ASNW. Much of the woodland occupies the steep-sided gullies of tributaries flowing northward to meet the Clywedog. The woodland is dominated by mature ash with beech, sycamore, oak and wych elm; including a number of over-mature oaks and beeches. The shrub layer is well developed and diverse comprising hazel, aspen, sycamore, beech, holly and ash. The field layer is diverse with abundant bramble, herb robert, yellow archangel, male-fern and hedge woundwort. Other species include ransoms, hart's tongue-fern, wood speedwell, dog's mercury, false wood-brome, wood fescue, bluebell, wood avens and honeysuckle (W8e NVC sub-community). Flushed areas and the river side support alder, tufted hair-grass, lesser celandine, wild angelica and opposite-leaved golden-saxifrage. Within this area, adjacent to the Clywedog trail and public footpath, are glades supporting areas of grassland, bracken and scrub. Two of the glades support species rich grassland, however, elsewhere the sward is relatively poor and dominated by Cock's foot and Yorkshire-fog. Bracken dominates the north facing slopes especially at the southern end of the sub-compartment. Scrub requires control to prevent in encroaching upon the open habitats from the woodland edge. Part of this area is largely inaccessible, being bounded by the river and a minor road, with no public access. Sandstone outcrops at the eastern end of the sub-compartment are dominated by mature beech (and a very large oak) with Greater wood-rush locally frequent here.</p>							
2a	11.30	Mixed broadleaves	1970	PAWS restoration	Archaeological features, Sensitive habitats/species on or adjacent to site, Very steep slope/cliff/quarry/mine shafts/sink holes etc	Semi Natural Open Ground Habitat	Other, Planted Ancient Woodland Site, Special Landscape Area

This sub-compartment comprises a significant area of replanted woodland (mainly ancient) to the north of the river and west of Offa's Dyke. The majority of this area was replanted with a variety of conifer species around 1960. However, thinning in the period 1996-2010 has locally reduced the cover of conifers, leaving a canopy with a mixed-age and mixed species composition. The canopy is now variable with areas in various phases of conifer thinning. In places, conifers (mainly stands of western hemlock and Douglas fir with small stands of pine) are still relatively dense despite initial thinning in the last plan period, to which management the ground flora has shown a strong initial response. Norway Spruce and larch are also present near to the northern boundary/ Offa's Dyke but have been subject to thinning between 1996 and 2002. There are also areas now dominated by broadleaves (mainly ash, oak, sycamore and beech with occasional silver birch, wild cherry and rowan), often with scattered conifers remaining. Natural regeneration is abundant in these areas. Occasional large over-mature beech and oak are present, especially near the river and at the northern end of the sub-compartment where large, widely-spaced, oaks dominate. Rhododendron, which was formerly widespread, has been largely cleared with only scattered individuals and re-growth. The shrub and field layer is variable comprising bramble, bluebell, broad buckler-fern, creeping soft-grass, bracken, wood sorrel, wood anemone, greater wood-rush, ivy, honeysuckle, tufted hair-grass and rosebay willowherb (W10e NVC sub-community). Locally (especially on the lower slopes) the flora is more diverse including many of the above species plus dog's mercury, wood sedge, wild privet, pendulous sedge and ramsons. A permissive path (Clywedog Trail) runs the length of the sub-compartment parallel to the river. The majority of other tracks within the sub-compartment are also available for public use.

2b	0.80	Ash	1920	High forest	Archaeological features, Sensitive habitats/species on or adjacent to site	Semi Natural Open Ground Habitat	Other, Special Landscape Area
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Area of semi-natural woodland adjacent to the river dominated by an open canopy of well-spaced mature ash with some sycamore and occasional large beech. There is little by way of a shrub layer other than scattered young ash, elder and guelder rose. The formerly patchy Rhododendron has been cleared. The field layer comprises dense bramble, dog's mercury, snowdrops, wood sorrel, Opposite-leave golden saxifrage, common nettle and soft-rush with occasional moschatel, sweet woodruff, wood sedge, wood anemone, herb robert, yellow archangel, wood fescue, greater wood-rush and enchanter's nightshade (W8e NVC sub-community).

3a	1.20	Mixed broadleaves	1995	Non-wood habitat	Archaeological features, No/poor vehicular access to the site, Sensitive habitats/species on or adjacent to site, Very steep slope/cliff/quarry/mine shafts/sink holes etc	Semi Natural Open Ground Habitat	Other, Scheduled Ancient Monument, Special Landscape Area
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This sub-compartment includes a section of Offa's Dyke that passes through the site, running north-south on either side of the river. The dyke comprises an impressive large bank at this point, with a wide ditch on its western side to the north of the river. To the north of the river, the dyke supports scattered large mature pedunculate oak and occasional beech and ash. Past management on the dyke has included coppicing of younger trees and shrubs. Nonetheless, regeneration is vigorous, particularly that of holly, wych elm, sycamore, ash and rowan with local western hemlock regeneration. To the south of the river, the dyke supports relatively dense semi-mature to mature broadleaved woodland with a mix of canopy species including sycamore, beech, oak, ash, silver birch and a dense shrub layer comprising holly, hazel, hawthorn, rowan and young canopy species. Ground flora is present with bramble locally abundant and other species including male-fern, great wood-rush, ivy, bluebell, bracken and ramsons. Immediately north of the river is a small area of open marshy vegetation (to the west of the dyke) supporting tall dense Giant horsetail, Great willowherb, Common nettle, Pendulous sedge and Soft-rush over a carpet of Opposite-leaved golden saxifrage and Creeping buttercup.

4a	2.70	Beech	1970	PAWS restoration	Archaeological features, Sensitive habitats/species on or adjacent to site, Very steep slope/cliff/quarry/ mine shafts/sink holes etc	Semi Natural Open Ground Habitat	Great Landscape Value, Other, Planted Ancient Woodland Site, Special Landscape Area
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Replanted ancient woodland to the north of the river and east of Offa's Dyke: dominated by semi-mature and mature beech and mature Douglas fir, which have been subject to a past thinning operation, although the compartment remains relatively shady. Ash, pedunculate oak, sycamore and lime are occasional. There is little by way of a shrub layer other than young beech. The field layer is variable and diverse, although sparse in places. Bramble is locally dominant but other species include wood anemone, dog's mercury, wood sedge, pendulous sedge, hart's-tongue fern, enchanters nightshade, bluebell, wood speedwell, yellow pimpernel and yellow archangel. Ramsons are locally abundant and ash regeneration is frequent. (W8e/f NVC sub-communities). On the slopes the vegetation is less species-rich with frequent bare ground, bluebell, broad buckler-fern, wood sorrel, bracken, creeping soft-grass and bramble (W10e NVC community). Wet areas near to the track to the east support locally abundant violet.

4b	3.50	Sycamore	1970	High forest	Archaeological features, Housing/infrastructure, structures & water features on or adjacent to site, Sensitive habitats/species on or adjacent to site	Semi Natural Open Ground Habitat	Great Landscape Value, Other, Planted Ancient Woodland Site, Special Landscape Area
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Replanted ancient woodland at the eastern end of the site (both sides of the river) dominated by semi-mature sycamore but with frequent semi-mature ash, wild cherry and beech, scattered/locally frequent mature broadleaves (oak, beech, sycamore, horse chestnut) and very locally frequent mature poplar and alder. The shrub layer comprises young sycamore, ash and wych elm. The field layer is diverse and often species-rich. Dog's mercury and Ramsons are each locally dominant. Other species include bramble, Red campion, Herb robert, ivy, Wood speedwell, Wood anemone, bluebell and Yellow archangel. Sycamore seedlings are frequent. (W8e/f NVC sub-communities).

5a	2.50	Mixed broadleaves	1930	High forest	Mostly wet ground/exposed site, No/poor vehicular access to the site, People issues (+tve & -tve)	Semi Natural Open Ground Habitat	Ancient Semi Natural Woodland, Planted Ancient Woodland Site, Special Landscape Area
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This sub-compartment comprises woodland to the south-west of the site, separated from the rest of the woodland by minor roads. The area is partly replanted but thinning in the late 1990s removed the majority of the conifers with Douglas fir now only locally frequent. The canopy is dominated by mixed mature broadleaves including locally dominant beech, ash, silver birch, pedunculate oak, wild cherry, rowan and sycamore. Two rows of mature poplars remain. Holly, elder wych elm and young ash, sycamore and wild cherry make up the shrub layer: much of shrub layer now consists of sycamore coppice re-growth from previous control attempts. The field layer is dominated by dense stands of bramble with scattered to locally frequent Broad buckler-fern, Tufted hair-grass, bluebell, ivy, honeysuckle and Rosebay willow-herb (W10e NVC sub-community). Along paths and margins species such as Dog's mercury, Herb robert, Yellow archangel, Wood melick, Wood anemone and Wood speedwell are locally frequent (W8e NVC sub-community). The western end comprises an area of wet semi-natural woodland dominated by crack willow and alder (much fallen) with areas of standing water (shaded pools). Common nettle, Meadowsweet, Marsh marigold, Creeping buttercup, Floating sweet-grass, Water mint and Bittersweet are common here (W6c NVC sub-community). Roadside hedgerows, predominantly of holly, bound the sub-compartment to the south and east. A definitive public footpath crosses this sub-compartment.

6a	4.30	Sycamore	1970	PAWS restoration	Archaeological features, Sensitive habitats/species on or adjacent to site	Semi Natural Open Ground Habitat	Planted Ancient Woodland Site, Special Landscape Area
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Replanted woodland (mostly ancient) to the south of the river comprising dense, mainly young, single species stands of sycamore and beech, a double row of western hemlock, and patches of planted larch with a couple of mature specimens. The woodland was thinned in the period 1996-2000. Rhododendron has been locally cleared but remains occasional to locally frequent. There is also some sycamore re-growth (from cut stumps). More diverse and mature semi-natural woodland remains along the river edge with silver birch, ash, beech, sycamore and oak. The field layer vegetation is variable but bramble, bluebell and Broad buckler-fern are dominant over the majority, with locally frequent honeysuckle, Wood sorrel, Wood anemone, bracken and Greater wood-rush (W10e NVC sub-community). Locally the field layer is more diverse with Ramsons, Dog's mercury, Herb robert, Enchanter's nightshade, Wood speedwell, Sweet woodruff, Hart's-tongue fern, Lady-fern and Male-fern (W8e/f NVC sub-communities). A permissive bridlepath passes through the sub-compartment, with cycling also allowed along this path. Scallops cut adjacent to the path support dense common nettle with bramble, Rosebay willow-herb and Creeping buttercup.

6b	1.20	Mixed conifers	1985	PAWS restoration	No/poor vehicular access to the site, Sensitive habitats/species on or adjacent to site, Very steep slope/cliff/quarry/ mine shafts/sink holes etc	Semi Natural Open Ground Habitat	Special Landscape Area
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Narrow strip of mainly replanted woodland dominated by young dense mixed conifers (including larch and Douglas fir), first thinned in 2010, and dense scrubby broadleaved species (including sycamore, ash, silver birch, pedunculate oak, wild cherry, holly, elder and goat willow). There are scattered mature trees (including sycamore and wild cherry). Beneath the dense short canopy the ground is often bare, with locally frequent honeysuckle, bluebell, bramble, Broad buckler-fern and bracken. There is no maintained access within this sub-compartment.

6c	0.30	Oak (pedunculate)	1850	High forest	No/poor vehicular access to the site, Sensitive habitats/species on or adjacent to site, Very steep slope/cliff/quarry/ mine shafts/sink holes etc	Semi Natural Open Ground Habitat	Special Landscape Area
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Narrow, very steep, strip of mainly mature semi-natural woodland along the southern bank of the river. Mature (notably old) pedunculate oak is dominant with mature beech and younger ash and wild cherry. The western end of the strip has been replanted with larch. Holly is frequent and the field layer includes dog's mercury and common nettle at the top of the slope and great wood-rush, bramble, ivy and broad buckler-fern lower on the bank. Public access is confined to short section of path at the eastern boundary of the sub-compartment that provides a link to a permissive route on neighbouring land.

7a	2.60	Japanese larch	1980	PAWS restoration	Archaeological features, Sensitive habitats/species on or adjacent to site	Semi Natural Open Ground Habitat	Special Landscape Area
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Area of relatively young larch plantation with some Douglas fir and pine, much of which is PAWS. Despite initial thinning works in the last plan period, the conifers remain dense and dominant with broadleaves restricted to occasional scattered silver birch, rowan, ash and sycamore (very occasional large mature oaks along the boundary). Field layer vegetation is significantly suppressed. There is much bare ground, locally frequent/abundant ivy, Broad buckler-fern, bramble and Wood sorrel and scattered bluebell, Yellow archangel, Red campion, Cleavers, Herb robert and Male-fern. Western hemlock is regenerating strongly in more open areas along the riverside. A permissive path (track) runs through the plantation with scallops cut either side. These are dominated by bramble, bracken and Rosebay willow-herb with Yorkshire-fog, hogweed, Cleavers, Creeping buttercup and Soft-rush. This track would provide access for extraction from this area. Fly-tipping is regular and problematic in the vicinity of the road access.

7b	0.90	Western hemlock	1930	PAWS restoration	Archaeological features, No/poor vehicular access to the site, Very steep slope/cliff/quarry/ mine shafts/sink holes etc	Semi Natural Open Ground Habitat	Planted Ancient Woodland Site, Special Landscape Area
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Replanted ancient woodland thinned (heavily) in the late 1990s. Mature western hemlock remains frequent in the open canopy, however, much of the sub-compartment is now dominated by mature broadleaves including Pedunculate oak, beech, sycamore and ash. Holly is notably abundant and Rhododendron is scattered/locally frequent. The field layer is dense under the open canopy with abundant bramble and frequent/locally abundant Tufted hair-grass, Rosebay willow-herb, Pendulous sedge, Greater wood-rush, Broad buckler-fern, honeysuckle, bluebell, ivy and Wood sorrel. There is frequent regeneration of Western hemlock, silver birch and ash. (W10e NVC sub-community). Ramsons and Wood anemone are abundant along the river (W8f NVC sub-community). There is no maintained access within this sub-compartment.

7c	0.60	Sycamore	1930	High forest	Archaeological features, No/poor vehicular access to the site	Semi Natural Open Ground Habitat	Planted Ancient Woodland Site, Special Landscape Area
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A rather wet, low-lying area of mostly broadleaved PAWS, mainly dominated by dense sycamore but with locally abundant beech and ash and occasional wild cherry and horse chestnut. Holly is locally frequent but Rhododendron which was previously dominant in the shrub layer but has been largely cleared. Oregon grape is, however, also present. Ramsons are abundant throughout the field layer (W8f NVC sub-community). There is no maintained access to this sub-compartment.

Appendix 2: Harvesting operations (20 years)

Forecast Year	Cpt	Operation Type	Work Area (ha)	Estimated vol/ha	Estimated total vol.
2013	6b	Thin	1.20	20	23.496
2019	2a	Thin	3.25	35	113.75
2019	6b	Thin	0.58	35	20.3
2020	5a	Thin	2.00	10	20
2020	6a	Thin	1.75	35	61.25
2021	2a	Thin	3.75	35	131.25
2021	4a	Thin	1.00	35	35
2021	4a	Thin	1.20	35	42
2021	7a	Thin	2.05	35	71.75
2021	7b	Thin	0.30	35	10.5
2026	2a	Thin	3.25	35	113.75
2026	5a	Thin	2.00	10	20
2026	6a	Thin	1.75	10	17.5

GLOSSARY

Ancient Woodland

Ancient woods are defined as those where there has been continuous woodland cover since at least 1600 AD. In Scotland ancient woods are defined strictly as sites shown as semi-natural woodland on the 'Roy' maps (a military survey carried out in 1750 AD, which is the best source of historical map evidence) and as woodland all subsequent maps. However, they have been combined with long-established woods of semi-natural origin (originating from between 1750 and 1860) into a single category of Ancient Semi-Natural Woodland to take account of uncertainties in their identification. Ancient woods include Ancient Semi-Natural Woodland and plantations on Ancient Woodland Sites (see below). May support many species that are only found in ancient woodland.

Ancient Semi - Natural Woodland

Stands in ancient woods defined as those consisting predominantly of native trees and shrubs that have not obviously been planted, which have arisen from natural regeneration or coppice regrowth.

Ancient Woodland Site

Stands in ancient woods that have been converted to plantations, of coniferous, broadleaved or mixed species, usually for timber production, including plantations of native species planted so closely together that any semi-natural elements of the understorey have been suppressed.

Beating Up

Replacing any newly planted trees that have died in the first few years after planting.

Broadleaf

A tree having broad leaves (such as oak) rather than needles found on conifers (such as Scots pine).

Canopy

The uppermost layer of vegetation in a woodland, or the upper foliage and branches of an individual tree.

Clearfell

Felling of all trees within a defined area.

Compartment

Permanent management division of a woodland, usually defined on site by permanent features such as roads. See Sub-compartments.

Conifer

A tree having needles, rather than broadleaves, and typically bearing cones.

Continuous Cover forestry

A term used for managing woods to ensure that there are groups or individual trees of different ages scattered over the whole wood and that some mature tree cover is always maintained. Management is by repeated thinning and no large areas are ever completely felled all at once.

Coppice

Trees which are cut back to ground levels at regular intervals (3-25 years).

Exotic (non-native) Species

Species originating from other countries (or other parts of the UK) that have been introduced by humans, deliberately or accidentally.

Field Layer

Layer of small, non-woody herbaceous plants such as bluebells.

Group Fell

The felling of a small group of trees, often to promote natural regeneration or allow planting.

Long Term Retention

Discrete groups of trees (or in some cases single trees) that are retained significantly past their economic felling age. Operations may still be carried out within them and thinning is often necessary to maintain stability.

Minimum Intervention

Areas where no operations (such as thinning) will take place other than to protect public safety or possibly to control invasive exotic species.

Mixed Woodland

Woodland made up of broadleaved and coniferous trees.

National vegetation classification (NVC)

A classification scheme that allows an area of vegetation to be assigned to the standardised type that best matches the combination of plant species that it contains. All woodlands in the UK can be described as being one of 18 main woodland types (W1 - W18), which principally reflect soil and climatic conditions. For example, Upland Oakwoods are type W11, and normally occur on well drained infertile soils in the cooler and wetter north and west of Britain. Each main type can be subdivided into numerous subtypes. Most real woods contain more than one type or sub-type and inevitably some woods are intermediate in character and can't be properly described by any sub type.

Native Species

Species that arrived in Britain without human assistance.

Natural Regeneration

Naturally grown trees from seeds falling from mature trees. Also regeneration from coppicing and suckering.

Origin & Provenance

The provenance of a tree or seed is the place where seed was collected to grow the tree or plant. The origin is the geographical location within the natural range of a species from where seeds/tree originally derives. Thus an acorn collected from a Turkey oak in Edinburgh would have an Edinburgh provenance and a southern European origin.

Re-Stocking

Re-planting an area of woodland, after it has been felled.

Shrub Layer

Formed by woody plants 1-10m tall.

Silviculture

The growing and care of trees in woodlands.

Stand

Trees of one type or species, grouped together within a woodland.

Sub-Compartment

Temporary management division of a compartment, which may change between management plan periods.

Thinning

The felling of a proportion of individual trees within a given area. The remaining trees grow to fill in the space created.

Tubex or Grow or Tuley Tubes

Tubes placed over newly planted trees or natural regeneration that promote growth and provide protection from animals such as rabbits and deer.

Weeding

The control of vegetation immediately around newly planted trees or natural regeneration to promote tree growth until they become established. Either by hand cutting or with carefully selected weed killers such as glyphosate.

Windblow/Windthrow

Trees or groups of trees blown over (usually uprooted) by strong winds and gales.