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WOODLAND
TRUST

Allt Gwernfelen

Management Plan 2019-2024

MANAGEMENT PLAN - CONTENTS PAGE

ITEM	Page No.
Introduction	
Plan review and updating	
Woodland Management Approach	
Summary	
1.0 Site details	
2.0 Site description	
2.1 Extended Description	
3.0 Public access information	
3.1 Getting there	
3.2 Access / Walks	
4.0 Long term policy	
5.0 Key Features	
5.1 Ancient Semi Natural Woodland	
5.2 Planted Ancient Woodland Site	
6.0 Work Programme	
Appendix 1: Compartment descriptions	
Appendix 2: Harvesting operations (20 years)	
Glossary	

MAPS

Access
Conservation Features
Management

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 Consequently this printed version may quickly become out of date, particularly in relation to the planned work programme and on-going monitoring observations.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:	Allt Gwernfelen
Location:	Llandoverly
Grid reference:	SN798336, OS 1:50,000 Sheet No. N/A
Area:	16.19 hectares (40.01 acres)
Designations:	National Park, Planted Ancient Woodland Site

2.0 SITE DESCRIPTION

2.1 Extended Description

Allt Gwernfelen lies just over 2 miles east south-east of the historic market town of Llandovery and comprises 16.34 hectares of predominantly coniferised ancient woodland. It is connected to Ancient Semi-Natural Woodland to the north (Cwm Bont-gam) and south (Allt Cefntelych) forming continuity with these neighbouring woodlands along the length of the valley of the tributary to Afon Gwydderig. Restoring Allt Gwernfelen to native broadleaved trees will create a significant contiguous broadleaf landscape in close proximity to other Ancient Semi-Natural Woodland sites in the area. A Woodland Survey, carried out in April 2018, generally corroborates the Ancient Woodland Inventory 2011 classifications and boundaries. The site is within the Brecon Beacons National Park. No other designations exist within or adjacent to the site.

The site has an east/south east elevation and slopes steeply in places. The woodland is bounded on two sides by tributaries of the Afon Gwydderig and comprises stands of conifers planted in 1995, the majority of which are Sitka spruce and Douglas fir of high yield class. Some small stands of Norway spruce, Noble fir and Japanese larch and many stand edges have been planted up with lines of Nordman fir, possibly as a Christmas tree crop. There are a few stands of mixed broadleaves planted with birch, alder, rowan, oak, hazel as well as a stand of red alder. The conifer and broadleaf stands have been thinned and high pruned throughout the site, which has served to open up the understorey somewhat and will contribute to future timber quality. However the density of conifers across the site is a major threat to restoration. There is evidence to suggest that young broadleaves were also removed across compartments, leaving a small component of oak of good form which has been formatively pruned.

In terms of ancient woodland features and semi-natural habitat, the riparian zone ASNW which runs along the site's south eastern boundary is the most secure and ecologically robust part of the site, containing the majority of mature broadleaves, ash, alder, birch, oak and willow.

Allt Gwernfelen provides a particularly special opportunity to restore a plantation ancient woodland through the transformation of even-aged stands to continuous cover forestry and in so doing provide evidence for the economics of restoration.

The key features of Allt Gwernfelen comprise:

Plantation on Ancient Woodland Sites, which have been intensively modified by the introduction of non-native species

Ancient Semi-natural woodland, being those areas largely unaffected by coniferisation and with notable lower plant communities

Allt Gwernfelen has no public rights of way and is not open to the public. The intention is, once the wood is secure on a trajectory to restoration, to re-sell the wood, having demonstrated that similar restoration projects can be accessible and attractive to private woodland owners.

3.0 PUBLIC ACCESS INFORMATION

3.1 Getting there

3.2 Access / Walks

4.0 LONG TERM POLICY

In the long term, Allt Gwernfelen will represent a fine example of a restored ancient woodland site. It will be a rich and diverse restored ancient woodland comprising a mixture of site native broadleaved trees of different ages and even the occasional old conifer and non-native broadleaf. Ancient woodland specialist flora will be abundant and there will be a diverse range of native wildlife.

The woodland as a whole will develop much more structural diversity through the process of continuous cover transformation. In time, native broadleaved trees will predominate with only scattered and occasional conifer and non-native broadleaved trees remaining. Ultimately, the woodland will provide better opportunities for plant and fungi species lost from the wider landscape and as the structural and biological diversity of the site increases, the site shall become of use to a wider array of fauna. As the canopy becomes more dominated by native broadleaved species, silvicultural interventions will become infrequent and of lower intensity. Sessile oak would be expected to be the most abundant canopy tree; however, there should be a good degree of tree species diversity within the constraints of the soil and aspect. The remnant features of the ancient woodland will be secure and a significant expansion of woodland ground flora should be expected over a fifty year period, as conifer and non-native broadleaf cover in Allt Gwernfelen reduces. Non-native tree regeneration will generally be limited to where it is perceived to be having a minimal impact on the integrity of the ancient woodland, and any invasive non-native species will be under control or have been successfully eradicated. There will be sufficient recruitment of young broadleaved trees to ensure continuity of canopy cover and genetic turnover; however, this may be unevenly distributed.

Where the ecological impacts are positive or negligible, silvicultural opportunities to improve stem form in the native broadleaves will be taken, largely through individual tree selection for either retention or removal from competition. This will begin at a relatively early stage of the transformation process when native broadleaves are establishing well and the presence of conifers/non-native broadleaves is diminishing.

This will provide an opportunity to monitor the economics of transforming this kind of Plantation on Ancient Woodland to a mixed native species assemblage through continuous cover forestry techniques. Over the period of WT ownership (likely to be around 25 years), the wood will be placed firmly on a trajectory to restoration, with all ancient woodland stands being deemed secure. Over the life of the project, we will have demonstrated the economic viability of restoration at Allt Gwernfelen through a continuous cover forestry transformation, our interventions having proven at least cost-neutral, or better. At the end of the period, the wood will be an attractive prospect to a small woodland owner, with a generally low conifer basal area (ideally in the low teens) having permitted advanced broadleaf understorey regeneration, while retaining potentially high value crop trees. The value of the site should be equal to or have increased since our purchase and be sold on to the private market with the potential for on-going (primarily hardwood) timber production.

Invited visitors to the site will be able to move around it reasonably safely and enjoy a relatively low-key infrastructure.

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

Eastern-facing linear riparian strip of predominately broadleaf woodland comprising of ash, alder, oak with understory of hazel, grey willow and downy birch (NVC W7/W9). Ground is very wet with associated ancient woodland indicator species. Surrounded by PAWS and sheep pasture.

All of the woodland at Allt Gwernfelen is regarded as ancient, although much has been heavily modified by human activity. A small proportion of Allt Gwernfelen is characterised as semi-natural ancient woodland: relatively small areas remain with dominant native broadleaf canopy and understory in a semi-natural structure, having escaped coniferisation. These comprise an area of native broadleaved trees in the NE part of the site planted in 1995 after the removal of the previous conifer crop and the riparian strip running SW-NE alongside the river tributary. Another small adjacent area was planted with native broadleaves at the same time, but subsequently underplanted with a noble fir nurse crop and another was planted with fast-growing red alder. These areas of planted ancient woodland will effectively become part of the ASNW feature and will be managed accordingly. For most of the site, the woodland type could be characterised as upland oakwood, mainly comprising sessile oak and birch (NVC W11). However, areas of base-enrichment or flushing do occur, especially in the riparian zone where alder is more dominant but including components of willow, ash, elm, oak and hazel (NVC W7).

Significance

Sits within a well-wooded landscape providing connectivity between neighbouring ASNW to north and south.

The ASNW here (NVC W7/W9) are a priority habitat in the UK and local Biodiversity Action Plans. Being irreplaceable in their own right in providing continuity and connectivity of native species and habitats on the site, they will also contribute to the restoration of the neighbouring PAWS by providing an adjacent seed source. They will provide areas of more established and older trees and habitat as restoration on the rest of the site progresses and form an important element of a significant contiguous block of ASNW with neighbouring woodland to the north and south allowing for long-term expansion of nationally uncommon species. Ancient woodland cannot be recreated, so the opportunity to protect and restore damaged elements of ancient woodland is a crucial opportunity to secure a threatened natural resource.

Opportunities & Constraints

Constraint - riparian, wet/boggy ground conditions.

Across the site, there are hot spots of broadleaf regeneration mainly oak, birch and hazel with some areas of alder and willow where soil moisture is higher. There are very few pre-plantation broadleaves outside of the ASNW strip except for a few mature oak and birch along boundaries. Understories across compartments are heavily shaded with very little in the way of structure or floral diversity. The ground flora is sparse except for scattered hotspots and ride/stand edges which often contain a diverse suite of ancient woodland indicators.

There is enormous potential to restore the whole site gradually by thinning the uniform conifer stands and embarking upon a process of transformation towards a more complex irregular structure; the ASNW areas will play a vital role in providing a seed source for the restoration of the PAWS areas to progress. In order to steer the process of transformation, fixed point monitoring plots will be established across the site and a full volume inventory carried out. These data will inform thinning intensities and provide a base line against which to measure the success of all future operations.

The main opportunity is to enhance the remnant fragments of ancient woodland at Allt Gwernfelen through the restoration of adjacent PAWS and the subsequent re-integration of it with the ASNW to the north and south. This will be through the continued control of invasive and negatively impactful species such as conifer regeneration and potential outbreaks of invasive species such as rhododendron and Japanese Knotweed. In terms of constraints, the site has a long boundary with agricultural land with the potential for stock trespass and subsequent damage to the recovering ground flora especially. Timber extraction from the riparian compartments could be potentially harmful to the site as the soils are softer and moister by nature, than the bulk of the PAWS. The main ASNW area is furthest away from the only access and is of predominantly small diameter material meaning any extraction of timber from these areas is unlikely to be economical for many years.

Factors Causing Change

The main threats to this wet woodland strip are grazing and browsing of native tree regeneration and immature bark and woodland specialist flora possible through deer and livestock ingress, and seeding of conifers from adjacent PAWS stands. Regenerating conifers and red alder will be an on-going threat while seeding canopy trees and other local seed sources remain. That said, no sub-compartments currently suffer from a mass of non-native regeneration.

Tree disease in the form of *Hymenocyphus fraxineus* (ash die-back) is also a factor likely to change the ultimate canopy composition: ash dieback could have a significant impact on tree species diversity and specifically on lichen and bryophyte diversity especially in the more humid riparian zone. Whilst a small component of the woodland by size, the areas of base-enriched soils with ash support a different community of epiphytes associated with base-rich bark. Possible ingress of coarse vegetation could occur if light conditions change.

Long term Objective (50 years+)

In the long term, Allt Gwernfelen will be a rich and diverse woodland comprising a mixture of site native broadleaved trees of different ages. Conifer and non-native broadleaf (red alder, sweet chestnut) will be rare in existing semi-natural stands. Ancient woodland specialist flora will be abundant and there will be a diverse range of native wildlife. The existing semi-natural woodland will be buffered and made more resilient through the gradual restoration of adjacent planted stands.

Ultimately, the woodlands will provide better opportunities for plant and fungi species lost from the wider landscape and as the structural and biological diversity of the site increases, the site shall become of use to a wider array of fauna. Any invasive non-native species will be under control or have been successfully eradicated. There will be sufficient recruitment of young broadleaved trees to ensure continuity of canopy cover and genetic turnover; however, this may be unevenly distributed.

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

The focus of management in the semi-natural ancient woodland areas of the site will be to ensure that all non-native invasive are under control and to remove conifer and non-native broadleaf regeneration at a stage before it becomes negatively impactful. Non-native conifer regeneration will be occasional. Grazing and browsing will not have a significant impact on ground flora and natural regeneration.

Management prescriptions:

* Control non-native conifer/ broadleaf regeneration and any emerging non-native invasive species (eg rhododendron seedlings) by pulling/ cutting and herbicide (glyphosate) if required.

5.2 Planted Ancient Woodland Site

Description

Allt Gwernfelen is an Ancient Woodland Site with a generally east-facing aspect. Allt Gwernfelen was still ancient semi-natural woodland as stored oak coppice until around 1954, when it was largely cleared and planted with conifers. The first rotation conifers were felled in the early 1990s before restocking with the current crop: the site was replanted in the mid-1990s with a mix of exotic conifers and broadleaves, including Sitka spruce, Douglas fir, red alder, sweet chestnut and Japanese larch. A dense conifer canopy covers approximately 90% of the site at present.

In summary, in the most recent PAWS assessment survey (2018), the majority of the site (13.34ha) was considered to be in a 'critical' or 'threatened' condition, with the remainder of the site being considered to be 'secure' (including woodland of ancient semi-natural character), although general threats of conifer and non-native broadleaf regeneration (and potentially invasive species like rhododendron) exist here.

Much of the young conifer component has been high pruned allowing for a moderate increase in side light levels, but not enough to encourage the establishment of native ground flora under the stands apart from around the edges. Most of the sub-compartments are in a fairly similar state having been restocked at the same time and line thinned. This has served to initiate the transformation to an irregular, broadleaf dominated structure, with some broadleaf regeneration and coppice regrowth, however, dense brash mats between the lines have largely suppressed recruitment of native trees.

For most of the site, the woodland type, in a semi-natural state, would be upland oakwood, dominated by sessile oak, birch, rowan and pockets of hazel (NVC W17/ W11), with ground flora dominated by bracken and bramble in places, and a bryophyte carpet, with scattered plants typical of these sorts of wooded acidic soils such as hard-fern, slender St John's-wort, common cow-wheat and bitter-vetch. In its current state, this is rarely well developed.

Significance

Sits within a well-wooded landscape providing connectivity between neighbouring ASNW to north and south.

The PAWS areas here have the potential for restoration to native upland oakwood (W11/17), a priority habitat in the UK and local Biodiversity Action Plans. Restoration would enhance local biodiversity and create a significant contiguous block of ASNW with neighbouring woodland to the north and south and allow for long-term expansion of nationally uncommon species. Ancient woodland cannot be recreated, so the opportunity to restore damaged elements of ancient woodland is a crucial opportunity to secure a threatened natural resource.

The woodland was purchased as part of the Trust's Purchase-Restore-Pass On initiative, which specifically aims to put threatened woods firmly on a trajectory to restoration whilst demonstrating the potential for restoration to be at least cost-neutral, in terms both of operations and land values and hence accessible to private landowners. The intention is, once the ecological integrity of the woodland has been secured, to put the secure woodland back on the market.

Opportunities & Constraints

Opportunities:

PAWS restoration allowing broadleaves to regenerate and form a major part of the canopy structure along with securing remnants. Adjacent ASNW provides refuge for species which can then expand into restored PAWS areas, therefore there is high potential to restore the woodland to a high quality habitat, increasing native woodland cover. There are a number of remnant ancient woodland features also occurring within the PAWS areas, including pre-plantation broadleaf trees and ground flora.

The wood's age class (largely P95) and infrastructure, including a good network of recently improved internal tracks, present a good opportunity to transform even-aged stands to a more complex, irregular structure through continuous cover forestry. There is an opportunity to demonstrate that the Trust's restoration goals are achievable in a private woodland context: as part of the Purchase-Restore-Pass On initiative, there is an opportunity to put the wood on a trajectory to restoration while remaining cost-neutral or better over a c25 year period and to achieve ancient woodland restoration while ensuring a quality timber product, leaving the woodland as an attractive purchase prospect on completion of the project.

Whilst there is evidence in the past that the woodland owner offered permissive access and members of the public may therefore occasionally visit the wood, there are no rights of way or public roads linking to the wood and therefore no intention to promote public access at the site.

Constraints include sloping ground, water courses within and adjacent to the site and an active badger sett. The management access route and its legal status may also limit the ability to extract large quantities of timber: it may be necessary to invest in access improvements or to consider secondary forwarding to an alternative landing stage, which will impact on the economics of wood production.

The Purchase-Restore-Pass On programme (PRP) also implies that only those grant schemes accessible to private landowners should be accessed in pursuit of our restoration goals. Budgetary considerations will therefore be a constraint (given the financial objective) although these should not compromise the ecological/ restoration imperative.

Third party access rights exist over tracks in the NW corner of the site.

Factors Causing Change

Browsing mammals (sheep, rabbits, deer) could impact on natural regeneration and flora.

Without intervention, dense shading effects from exotic conifers will increase.

Tree disease is also a threat. *Phytophthora ramorum*, is not considered a high risk to Allt Gwernfelen where there is a relatively small component of Japanese larch but *Hymenocyphus fraxineus* (ash dieback) could have a significant impact on tree species diversity and broadleaf regeneration within the PAWS stands.

Regenerating conifers and, to some extent, red alder will be an on-going threat while viable parent trees remain on site. Currently, there is little non-native species regeneration under any of the save for a small amount of track-side red alder in Cpt. 3a and 3b. The upper levels of the site may be prone to windblow as thinning progresses, with potential localised impact on broadleaf natural regeneration.

Squirrel damage is present on conifer and broadleaf species and if these impacts become significant this could impact on timber yield.

Invasive species are at present rare but could increase.

Long term Objective (50 years+)

Over the period of WT ownership (likely to be around 25 years), the wood will be placed firmly on a trajectory to restoration, with all ancient woodland stands being deemed secure. Over the life of the project, we will have demonstrated the economic viability of restoration at Allt Gwernfelen through a continuous cover forestry transformation, our interventions having proven at least cost-neutral, or better. At the end of the period, the wood will be an attractive prospect to a small woodland owner, with a generally low conifer basal area (ideally in the low teens) having permitted advanced broadleaf understorey regeneration, while retaining potentially high value crop trees. The value of the site should be equal to or have increased since our purchase and be sold on to the private market with the potential for on-going (primarily hardwood) timber production.

The woodland will be strongly characterised by a semi-natural species composition and structure, with a high proportion of native broadleaved canopy species, particularly sessile oak, birch, rowan with hazel also present. Ash (hymenocyphus permitting), elm, alder and willow will also occur more frequently on the damper soils of the riparian zone. Some non-native conifer species, sweet chestnut and red alder may still occur, but they will be having a limited impact on the ecological integrity of the site and will generally be as part of a high-quality irregular stand. A typical woodland flora will have recovered across most of the site, with conifer regeneration and coarse vegetation being occasional and localised. Invasive species will be absent. Lower plant communities will recover and spread from existing ASNW areas into restored PAWS, which in time will come to resemble the rich neighbouring ASNW areas. Mature and veteran trees and deadwood will be frequent.

This will be achieved through a graduated density thinning programme involving the phased removal of conifers on a rotation of around 5 years, whilst at the same time, improving stem quality (and future value) but reducing the risk of wind blow. This will be in combination with single tree selection around hotspots, to accelerate release, and extraction along predefined permanent extraction racks will minimise site damage. It is envisaged that most of the early felling will be at cost before the balance shifts to a revenue generating phase making operations cost-effective. Transformation to continuous cover will be controlled by selective felling to favour native broadleaves (either remnant pre-plantation specimens or young natural regeneration) and good quality conifer specimens, both of which are found within the various stands.

Enrichment planting may be considered only where transformation to native woodland is judged to be lagging, or if there is the risk of weed competition prohibiting natural regeneration of native tree species, with the preference being to allow seed from native species in areas of adjacent ASNW to establish as regeneration.

Although the wood is not promoted for public access, the wood will have an adequate access infrastructure and low tree hazard level suitable to the hosting of occasional visits to meet the potential demonstration or data-gathering needs of different teams within the Woodland Trust and our partners.

The good network of internal and external management access tracks will be maintained.

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

The priority for the first five years is to undertake initial interventions to reduce the threat level on critical stands. By the end of the plan period, no areas will be deemed to be 'critical', and all 'threatened' sub-compartments will have received some management intervention that moves them

towards an improved condition, achieving an overall reduction in the basal area of conifer.

Retained broadleaves will be protected during operations. Some thinning work will involve extraction where economically viable but will include a proportion (roughly 50%) of felling to waste, increasing the deadwood component of the woodland. The method will be to adopt a graduated density thinning programme, initiating the phased removal of conifers, whilst at the same time, improving stem quality (and future value) but reducing the risk of wind blow. These first operations will include the establishment of a permanent rack system to aid future operations.

Conifer and non-native broadleaved regeneration will be occasional, and controlled where it is deemed to be a potential impact on the ecological integrity of the site. Invasive species will be rare/absent with no threat of spreading.

Browsing herbivore impacts and damage to standing timber from squirrels will be within acceptable limits and will not jeopardise the long term productivity and ecological restoration of the site.

Notwithstanding the long term financial objectives, it is accepted that the 'first aid' phase of operations and initial site clearance undertaken within the first plan period is likely to be at cost, although with the intention of improving the value of crop trees in future operations.

A full volume inventory will be carried out. These data will inform thinning intensities and provide a base line against which to measure the success of all future operations.

Extraction may also necessitate some repairs or improvements to the existing management access, as well as basic maintenance of the internal track network.

Prior to the commencement of forestry works, dumped hazardous waste (asbestos) and fly-tipped tyres will be safely removed from site.

During 2019, a suitable management model will be determined, either through the appointment of an agent or trialing a share forestry model as appropriate.

The site will be safe and available to the Wales and UK Outreach teams (and others) as a venue for demonstration visits or data-gathering as required.

Management prescriptions:

*Sub-compartments 1a, 1b, 1c, 1d (plus conifer patches in 1e/f). Predominantly SS/ DF and a small stand of JL: establish permanent extraction racks where they don't already exist. Perform graduated density 2nd thinning by removing central row (as potential extraction rack) and selective felling from side rows. Gentle, phased release of native broadleaf specimens/ riparian zones and flora hotspots, prioritise broadleaf and DF of good form. Brash to be scattered thinly over site and timber to remain in small piles or in tree length. Consider ring-barking a small proportion of the poor-formed conifers to increase standing deadwood. By end 2020.

*Subcompartment 1g: 'clean' underplanted conifer and re-space to improve form of broadleaf crop species (oak and cherry)

6.0 WORK PROGRAMME

Year	Type of Work	Description	Due By
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APPENDIX 1: COMPARTMENT DESCRIPTIONS

Cpt No.	Area (ha)	Main Species	Year	Management Regime	Major Management Constraints	Key Features Present	Designations
1a	2.39	Sitka spruce	1995	PAWS restoration	Housing/infrastructure, structures & water features on or adjacent to site		National Park, Planted Ancient Woodland Site
<p>Site entrance with loading area and utility building to West. Bordered on all sides by stone tracks. General easterly aspect. Moderate slope, steep in places. Dense P95 Sitka spruce and Douglas fir plantation with higher percentage of Sitka to the west of the subcompartment and more Douglas fir to the east. All has been thinned once and side-pruned. Brash was stacked in tight windrows within the stand. Occasional hotspots of broadleaves. Bracken and bramble frequent; figwort, Slender St. John's-wort and hard fern, germander, speedwell and broom, pendulous sedge, wood sedge, opposite-leaved golden saxifrage, honey suckle, scaly male fern, wavy hair-grass, greater celandine and heather present as Ancient Woodland indicators.</p> <p>Status: Critical.</p>							
1b	3.63	Douglas fir	1995	PAWS restoration	Legal issues, Sensitive habitats/species on or adjacent to site, Very steep slope/cliff/quarry/mine shafts/sink holes etc		National Park, Planted Ancient Woodland Site
<p>Steep southern section with SE aspect becoming more gently sloped in northern section. Stand comprises P95 Douglas fir and Sitka spruce plantation thinned once and side pruned with high levels of brash deadwood. Higher frequency of broadleaves than neighbouring compartments with mature sessile oak and alder along streamside and grey willow and hazel. Bracken and bramble frequent. Yellow pimpernel and wood sorrel are Ancient Woodland indicators. Occasional hazel and holly regeneration. Small stand of Grand Fir between site boundary and track.</p> <p>Status: Critical.</p>							
1c	4.68	Douglas fir	1995	PAWS restoration			National Park, Planted Ancient Woodland Site

Steeply sloping stand of P95 Sitka spruce with minor components of Douglas fir and Japanese larch. Flatter area at bottom of stand and a small pond in the north of the sub-compartment. Abutts off-site Ancient Semi-Natural Woodland (Secure) to the south where the fence is damaged by a fallen oak limb. Previous thinning and some windblow have contributed to a more open canopy in places allowing some native broadleaf regeneration: rowan, grey willow and birch and hotspots of hazel. A good range of Ancient Woodland indicator flora are present including bluebell, wavy hair-grass, scaly male fern, honeysuckle, slender St. John's wort, remote sedge, polypody fern, wood sedge, yellow pimpernel, hard fern and greater celandine and the bryophyte, *Dicranum majus*.

Moderately steep sub-compartment with ESE aspect. Borrow pit on edge of compartment next to track. Stand comprises P95 Sitka spruce plantation thinned once and side pruned with high levels of windrowed brash. Sparse understory. Scattered broadleaves (sessile oak, birch, grey willow, hazel) including hotspots of formatively pruned oak regeneration. Bracken and bramble frequent on edges. Pendulous sedge, scaly male fern, Yellow pimpernel and wood sorrel are Ancient Woodland indicators.

Status: Critical.

Steep sub-compartment with ESE aspect. Stand comprises P95 Douglas fir and Norway Spruce plantation thinned once and side pruned with high levels of brash deadwood. Scattered broadleaves (rowan, birch, sessile oak) with occasional oak of good form. Higher frequency of broadleaves than neighbouring compartments. Bracken and bramble frequent around the edges. Hard fern noted as an Ancient Woodland indicator.

Status: Critical

1d	1.15	Sitka spruce	1995	PAWS restoration	Mostly wet ground/exposed site		National Park, Planted Ancient Woodland Site
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Stand of lower Yield Class Sitka spruce. Sub-compartment bisected by a small stream gully with broadleaf hotspot and higher floral diversity in riparian zone. Ash, rowan, grey willow, birch and hazel present.

Status: Critical.

1e	0.79	Mixed broadleaves	1995	PAWS restoration			National Park
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Thinned P95 mixed broadleaved species (ash, birch, grey willow, alder) including a component of red alder which is regenerating especially on the track and its edges. Contains a small stand of Douglas fir.

Bramble and tufted hair-grass present in the ground flora.

Status: Threatened.

1f	0.95	Mixed broadleaves	1995	PAWS restoration			National Park
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P95 mixed broadleaved species (alder, birch, rowan oak) unthinned. Oak could be favoured in thinning. Borrow pit at end of track access.
Status: Secure.

1g	0.69	Mixed broadleaves	1995	PAWS restoration			National Park
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Small stand of P95 mixed broadleaved species (sessile oak, rowan, wild cherry) under-planted in 2000 with Noble fir as a nurse for the oak and cherry. Dense thicket stage stand. Conifer beginning to dominate and the broadleaves in need of releasing.
Status: Critical/Threatened

2a	2.07	Mixed broadleaves	1995	Min-intervention	Mostly wet ground/exposed site		National Park
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Riparian Ancient Semi-Natural Woodland strip running SW-NE with patches of willow & alder carr with mature sessile oak, birch and ash with a hazel understory. Small number of sweet chestnut and wild cherry additionally planted.
Ancient Woodland indicator flora include wood sorrel, yellow pimpernel, honeysuckle, hart's tongue fern, opposite-leaved golden saxifrage, remote sedge, barren strawberry, bilberry, wood avens. Dog violet is also present.
Status: Secure.

Appendix 2: Harvesting operations (20 years)

Forecast Year	Cpt	Operation Type	Work Area (ha)	Estimated vol/ha	Estimated total vol.
2020	1a	Thin	11.00	68	750
2021	1g	Thin	0.69	29	20
2025	1a	Thin	10.70	84	900
2030	1a	Thin	10.40	84	873
2035	1a	Thin	10.10	84	847

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.