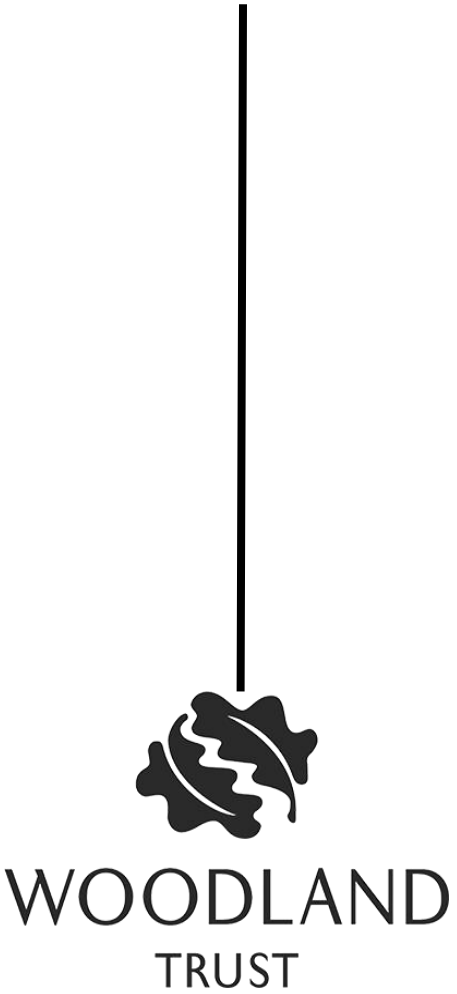
Portmoak Moss

(Plan period – 2024 to 2029)



Management Plan Content Page

Introduction to the Woodland Trust Estate

The Woodland Trust owns and cares for well over 1,250 sites covering almost 30,000 hectares (ha) across the UK. This includes more than 4,000ha of ancient semi-natural woodland and almost 4,000ha of non-native plantations on ancient woodland sites and we have created over 5,000ha of new native woodland. We also manage other valuable habitats such as flower-rich grasslands, heaths, ponds/lakes and moorland.

Our Vision is:

"A UK rich in native woods and trees for people and wildlife."

To realise all the environmental, social and economic benefits woods and trees bring to society, we:

- **Create Woodland** – championing the need to hugely increase the UK's native woodland and trees.
- **Protect Woodland** – fighting to defend native woodland, especially irreplaceable ancient woodland and veteran trees; there should be no loss of ancient woodland
- **Restore Woodland** – ensuring the sensitive restoration of all damaged ancient woodland and the re-creation of native wooded landscapes.

Management of the Woodland Trust Estate

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.

The following principles provide an overarching framework to guide the management of all our sites but we recognise that all woods are different and that their management also needs to reflect their local landscape, history and where appropriate support local projects and initiatives.

1. Our woods are managed to maintain their intrinsic key features of value and to reflect those of the surrounding landscape. We intervene in our woods when there is evidence that it is necessary to maintain or improve biodiversity, safety and to further the development of more resilient woods and landscapes.

2. We establish new native woodland for all the positive reasons set out in our Conservation Principles, preferably using natural regeneration but often by planting trees, 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. Where possible, we pro-actively engage with people to help them appreciate the value of woods and trees.

4. The long term vision for all our 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 natural and cultural heritage value of sites is taken into account in our management and in particular, our ancient trees are retained for as long as possible.

7. Land and woods can generate income both from the sustainable harvesting of wood products and the delivery of other services. We therefore consider the appropriateness of opportunities 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 encourage our woods to be used for 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. We maintain a network of sites for long-term monitoring and trials leading to reductions in plastics and pesticides.

10. Any activities we undertake are in line with our wider Conservation Principles, conform to sustainable forest management practices, are appropriate for the site and balanced with our primary objectives of enhancing the biodiversity and recreational value of our woods and the wider landscapes.

The Public Management Plan

This public management plan describes the site and sets out the long term aims for our management and lists the Key Features which drive our management actions. The Key Features are specific to this site – their significance is outlined together with our long, 50 years

and beyond, and our short, the next 5 years, term objectives for the management and enhancement of these features. The short term objectives are complemented by an outline Work Programme for the period of this management plan aimed at delivering our management aims.

Detailed compartment descriptions are listed in the appendices which include any major management constraints and designations. Any legally confidential or sensitive species information about this site is not included in this version of the plan.

There is a formal review of this plan every 5 years and we continually monitor our sites to assess the success of our management, therefore this printed version may quickly become out of date, particularly in relation to the planned work programme.

Please either consult The Woodland Trust website

www.woodlandtrust.org.uk

or contact the Woodland Trust

operations@woodlandtrust.org.uk

to confirm details of the current management programme.

A short glossary of technical terms can be found at the end of the plan.

Location and Access

Location maps and directions for how to find and access our woods, including this site, can be found by using the following link to the Woodland Trust web-site which contains information on accessible woodlands across the UK

https://www.woodlandtrust.org.uk/visiting-woods/find-woods/

In Scotland access to our sites is in accordance with the Land Reform Act (of Scotland) 2003 and the Scottish Outdoor Access Code.

In England, Wales and NI, with the exception of designated Public Rights of Ways, all routes across our sites are permissive in nature and where we have specific access provision for horse riders and/or cyclists this will be noted in the management plan.

The Management Plan

1. Site Details

Location:	Scotlandwell Grid reference: NO179014 OS 1:50,000 Sheet No. 58
Area:	43.59 hectares (107.71 acres)
External Designations:	N/A
Internal Designations:	N/A

2. Site Description

Location, Altitude and Aspect

Portmoak Moss is an open area of lowland raised bog, surrounded by mixed woodland. It is located approximately 200m south-west of the village of Scotlandwell, in Perth and Kinross and is located on flat ground (approximately 110m in altitude) between Loch Leven and the Lomond Hills. The woods surrounding the raised bog are visible from the Loch and surrounding roads as well as from the popular walks on the Lomond Hills. The climate for the Portmoak area is recorded as being that typical of fairly warm, moist lowland and foothill. The area is moderately exposed with moderate winters.

Physical Description

The underlying geological formations at Portmoak are mainly fluvial and of yellow and reddish-brown sandstone. This is overlain by glacial deposits of clay, and then course lake muds. The upper profiles are of deep peat. The peat would originally have been in the form of a dome, which is typical of a lowland raised bog. The peat is formed mainly from the semi-decomposed remains of sphagnum moss that has gradually built up since the end of the last ice age. In hydrological terms, such bogs are entirely rain-fed and the peat sustains a raised water table which enables the growth of moisture-loving sphagnum moss.

Over recent centuries the outer part of the peat dome has been cut for fuel, leaving only the centre of the raised area intact, in places surrounded by a sheer face of cut peat 2-3m high. In the centre of the dome the peat depth reaches 6m. Peat depth surveys on the site have shown that most of the site is situated on peat >1m in depth.

There are numerous drainage channels on both the raised and lower parts, historically dug to drain the site for peat cutting, grazing and forestry. Some of these date from the 1960s forestry planting, but some of the main drains are present on mid-19th century maps. This resulted in a lowering of the water table to the point where sphagnum, which remained in patches, was struggling to survive. A series of combined works from the mid-2000s onwards as part of the restoration of the core area of the raised bog, have resulted in a rise in the water table over parts of the site.

Site History

The peat deposits at Portmoak originally developed in a wet hollow left after the last ice-age. As peat deposition increased, this eventually became a raised dome.

In the middle ages, the area was part of a much larger uncultivated bog providing peat, turf and pasture to local communities. Peat may also have fuelled local lime kilns and a distillery. Use of the Moss for peat cutting by residents of Scotlandwell and Kinnesswood is well documented from the 17th – 20th century, after which the practise of peat cutting ended.

The earliest mapped woodland on the site dates from the mid-1800s and includes patches of woodland in the south-west and north of the site. These two areas, totalling 5 ha, are recorded in the Ancient Woodland Inventory as being Long Established Woodland of Plantation Origin (LEPO). A 1947 aerial photograph shows only a slight expansion of these areas, along with other scattered trees.

The site was bought by the Forestry Commission in the early 1960s, when it was drained and planted predominately with commercial conifers. It was acquired by the Woodland Trust in 1996, with combined funding from the Heritage Lottery Fund, Scottish Natural Heritage (now NatureScot) and considerable fundraising efforts from the Woodland Trust and local community (who subsequently set up the Portmoak Community Woodland Group). The on-going process of restoring part of the site to a functioning raised bog habitat began in 2000 and covers a core central area of approximately 12 hectares.

The Woodland Trust continue to work closely with the Portmoak Community Woodland Group on day-to-day management of the site.

Raised Bog

An on-going series of projects aimed at gradually restoring parts of the core area of the raised bog back to a favourable condition have been carried out since the Woodland Trust took on ownership of the site. Due to its rarity, high biodiversity value and potential for carbon storage, the raised bog habitat is the main focus of nature conservation interest on the site, despite its degraded state due to previous drainage and afforestation. Lowland raised bogs are an EU Annex 1 habitat and a UK Biodiversity Action Plan Priority Habitat.

Woodland Habitat

The woodland consists mainly of un-thinned commercial conifer stands planted between 1960 and 1963. The main planted species are Sitka spruce and Scots pine, with some Norway spruce, lodgepole pine, hybrid larch and sycamore. Occasional mature specimens of Scots pine, along with grand and noble fir are also found on site. Some areas of semi-natural birch woodland remain, particularly along the boundary. Poorly drained soils (mainly deep peat) combined with a high water table and lack of thinning of the commercial conifers has resulted in stands which are increasingly unstable and prone to windblow and wind snap.

The broadleaved woodland component consists predominantly of downy birch and willow species in the wet areas, but there are also occasional oak, rowan, silver birch, willow, sycamore and ash on the drier soils.

Some parts of the woodland are classed as Long Established Woodland of Plantation Origin (LEPO), as they appear on a map dated 1856. Little evidence of these early attempts at afforestation now remains, except for the occasional mature Scots pine.

Wildlife

Roe deer and brown hares are frequent visitors to the site. There are red squirrels and occasional grey squirrels seen on the site. A variety of bird species have been recorded on and around the Moss including: green and great spotted woodpecker, sparrowhawk, tawny owl, buzzard, kestrel, woodcock, jay, wood pigeon, tree creeper, siskin, redpoll along with a wide range of common woodland, garden and farmland species. Numbers swell in the summer months with the arrival of a wide variety of passerines.

A wide variety of invertebrates have been recorded; moths (notable species: buff footman, satellite moth), butterflies (notable species: small pearl boarded fritillary, green hairstreak), Odonata (damsel and dragonflies), as well as a wide range of aquatic species, woodland and raised bog specialists. The Woodland Trust and PCWG work with Butterfly Conservation, the British Dragonfly Society and NatureScot recorders in regard to the range of invertebrate species found.

Access

Within the site there is a network of 1872m of surfaced paths. The loop path (1472m) encircles and traverses across the core area of the raised bog, passing through areas of mainly coniferous woodland (Core path PTMK/117). The northern part of the loop forms part of the Michael Bruce Way, a circular route linking the villages of Scotlandwell and Kinnesswood with the Woodland Trust sites of Portmoak Moss and Kilmagad Wood and the Loch Leven Heritage Trail (Core paths PTMK/7, PTMK/103). Several informal unsurfaced paths traverse the site, some of which pass over wide drains via sleeper bridges. The informal routes are often muddy in places.

There are two public entrances to the site. There is a small parking area on the access track to the main entrance where parking is permitted by the landowner. The wood attracts over 11,000 visits a year.

Community Involvement

There has been considerable local interest in the woodland, starting with fund-raising for the acquisition in 1996 and

subsequently through the establishment of the Portmoak Community Woodland Group (PCWG), which is also actively involved with the nearby Woodland Trust Kilmagad Wood. PCWG organises frequent activities, community events, guided walks and helps with the day-to-day management of the bog and woodland by organising and running work parties.

In addition to PCWG involvement, there has always been wider local consultation over many issues affecting the woodland, including in 2002 a public consultation meeting to discuss the potential restoration of part of the raised bog area. In 2012 a 'Boginar' event was held which included relevant specialist speakers to discuss the future management and long-term potential of the raised bog.

3. Long Term Policy

Raised Bog

The long-term policy of the site will be focussed on the restoration of the lowland raised bog, which is the most valuable habitat on the site (in terms of carbon storage and biodiversity). The long-term intention is that ground conditions over the core bog area (NVC type M18 Erica – Sphagnum bog) will be maintained as a raised bog habitat with open wet ground interspersed with spreading open pools. Scattered regeneration of scrub and trees will be minimal and growth will be stunted due to high water levels in the bog. Any regeneration encroaching on the raised bog will continue to be removed by volunteers or contractors.

Areas of lagg fen will naturally establish over the long-term after restoration works, further encouraging water retention across the bog. Where possible and practical, deeper pools will be retained for aquatic and Odonata invertebrates.

Woodland Trust intends to work closely with NatureScot Peatland Action in the short and long-term, to continue to restore the raised bog habitat and use their expertise to monitor and plan any necessary interventions. As each forest-to-bog restoration is somewhat experimental and due to the degraded nature of Portmoak Moss, it is unfortunately possible that Peatland Action may suggest that restoration work will not be successful. If this is the case, Woodland Trust will continue draw on the advice and experience of NatureScot's Peatland Action staff and other experts to determine the viability of alternative management interventions that will benefit the most valuable habitats.

Woodland

To develop a resilient, sustainable and diverse woodland habitat where appropriate around the raised bog. The woodland will consist predominately of mixed native species with a diverse range of age classes (approximate NVC class W4 / W16 / W17). Due to the presence of deep peat across most of the site, species composition will be comprised of naturally regenerated native broadleaved trees and Scots pine.

Due to the increasing instability and heightened risk of large scale windblow amongst the non-native conifer plantation, a programme of clearfell will take place, focusing in particular where it has been identified that this will have a positive effect on the raised bog habitat.

Connecting People with Woods and Trees

The site will continue to provide informal access, in accordance with the Scottish Outdoor Access Code, for local users as well as visitors accessing the site via the Michael Bruce Way and Loch Leven Heritage Trail. The raised bog area and surrounding woodland will also continue to attract visitors with an interest in conservation and species monitoring. The managed path network will continue to be maintained to provide access to the woodland and raised bog habitats.

Regular inspections will be undertaken with regard to tree safety and other access features. Remedial work will be carried out as needed. There will be some areas of woodland left as wildlife refuges where access will not be encouraged e.g. small pearl boarded fritillary breeding zone in compartment 1b. The paths will link well into the surrounding path network and where possible the existing network of unmanaged paths will be retained.

The Portmoak Community Woodland Group will continue to be actively involved with the on-going management of the site through regular updates at their meetings and work days to undertake various tasks. Wider public consultation will also be undertaken whenever the Management Plan is reviewed.

4. Key Features

4.1 f1 Connecting People with woods & trees

Description

Portmoak Moss is an attractive location, with diverse habitats to offer visitors including a lowland raised bog, conifer plantations and mixed broadleaf areas. As raised bogs are an uncommon habitat in Scotland, the site and the ongoing restoration work provides additional local interest.

Access is promoted from an informal parking area at the eastern edge of the site, where there is parking for approximately ten cars (the parking area is not on Woodland Trust land, but parking is permitted by the landowner). A dirt track from the B920 heads west at the southern end of Scotlandwell to access the car parking area. The entrance to Portmoak Moss is obvious from the car parking area, where there is a welcome board and leaflet dispenser.

Local walkers also access the woodland from the A911 following a small path past the Portmoak Village Hall, through a field into the north side of Portmoak Moss. There is a second official entrance to the Moss from the Michael Bruce Way at the north-west of the site.

A stone surfaced path loop (1472m) passes through both woodland and the bog restoration area. The northern part of the loop is a long-standing right of way and forms part of the Michael Bruce Way, a circular route linking the villages of Scotlandwell and Kinnesswood with the Woodland Trust sites of Portmoak Moss and Kilmagad Wood (core path PTMK/7 and PTMK/117). The surfaced path holds standing water during periods of heavy rain. There are also several informal desire lines throughout the woodland, roughly following the site boundary.

There are two interpretation panels on the raised bog explaining about the habitat and ongoing restoration works, which are due to be renewed. There are Woodland Trust welcome signs and Portmoak Community Woodland Group signs at the two official entrances.

The nearest communities to Portmoak Moss are the villages of Scotlandwell and Kinnesswood, and the towns of Kinross (10km away with a population of approximately 5,500) and Glenrothes (10km away with a population of approximately 38,000). It is assumed that most of the people who use the woodland are local people, however the Loch Leven Heritage Trail and Lomond Hills are popular with tourists and visitors from further afield. Most visitors are walkers, but the site is also used by runners, young families and bird watchers, with estimated visitor numbers of around 11,000 visits per year.

Nearby Loch Leven also attracts numerous visitors, in particular cyclists, runners and long-distance walkers to the surfaced loop path around the Loch. The loch is designated as a National Nature Reserve (primarily for the birdlife found there) and NatureScot have installed a bird hide on the shores which is popular with families and bird watchers. RSPB manage a nature reserve and visitor centre nearby and Historic Environment Scotland manage the popular Lochleven Castle, accessible in summer by boat.

The Portmoak Community Woodland Group (PCWG) run a variety of public and school engagement and work party days at Portmoak Moss and nearby Kilmagad Wood (which is also owned by Woodland Trust). At Portmoak, PCWG run an annual community Christmas tree event removing spruce regeneration from the bog and a variety of local interest and nature events throughout the year. PCWG volunteers regularly engage with the local Portmoak Primary School (1km away), where volunteers have helped facilitate John Muir Awards and outdoor education events for school pupils. PCWG volunteers have produced two booklets for young people: 'Bogtastic' and 'Treetastic' which provide a fun, interactive and educational resource for young people visiting Portmoak Moss and Kilmagad Wood, printed copies of which are available in leaflet dispensers at entrances to the sites.

There are very basic facilities on site to host groups, with car parking limited to approximately ten cars at the informal parking area. The village hall and local farm shop have previously been used as an event venue and catering, which are approximately a 10 minute walk away respectively.

Significance

Portmoak Moss is a rare example of a lowland raised bog, of which there are few in Perth and Kinross. The initial 'forest to bog' restoration work and the potential for future peatland restoration work on the site could provide a powerful demonstration of peatland conservation in an accessible location, with the opportunity to attract additional visitors including educational visits.

Lying on the edge of the Loch Leven National Nature Reserve, Portmoak Moss provides a key linking path network from the Loch Leven Heritage Trail towards Kilmagad Wood and into the Lomond Hills. It is well-used by nearby communities and from those visiting from further afield. It is well-loved by the local community and the Portmoak Community Woodland Group are an important and powerful voice sharing the ongoing conservation work on the site.

Opportunities & Constraints

Opportunities:

- Improve informal path network on the site to provide additional routes and links to nearby long-distance access routes. Work with Portmoak Community Woodland Group to plan and develop any changes or upgrades.

- Increase path links and interpretation from Loch Leven Heritage Trail.

- Greater engagement with local schools and to work more closely with the Portmoak Community Woodland Group to facilitate greater community engagement.

- Press and media content from the Portmoak Community Woodland Group's volunteer work and public events.

- Engage with universities to facilitate research projects about the raised bog restoration and habitat.

Constraints:
- Deep peat and management objectives to increase water retention on the raised bog limits the potential for maintenance on the surfaced path, which can often become wet and hold puddles.

- Rising water levels on the raised bog following restoration may affect current access routes and require diversion or the construction of boardwalks.
- Water-filled ditches can be hazardous and impede access in some areas.

- There is limited car parking nearby and poor vehicle access onto the site, which is restrictive for larger machinery and for facilitating large volunteer or educational groups.

Factors Causing Change

Possible future raised bog restoration work may increase visitor numbers to the site, in addition to the resulting increased water levels impacting existing paths.

Long term Objective (50 years+)

The site will provide informal recreation to mainly local users as well as visitors using the Michael Bruce Way. Entrances and signage will be welcoming, encouraging a wide variety of visitors to the woodland. The main path network will be maintained to allow appreciation of the raised bog habitat in addition to the areas of retained native woodland.

Interpretation will outline the restoration process of Portmoak Moss from 'forest to bog' and educational group visits will be facilitated to showcase Portmoak Moss as a successful restoration site. The Woodland Trust will continue to work closely with the Portmoak Community Woodland Group to facilitate community and school engagement events as well as small-scale volunteering opportunities and ongoing management.

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

- Ensure that the site is safe and welcoming for visitors in line with Woodland Trust access guidelines and site access coding (A), and according to the Scottish Outdoor Access Code. This will be achieved by annual mowing of managed paths, in addition to keeping managed paths well-drained (where this does not affect the raised bog habitat) and free from vegetation/scrub encroachment, obstacles and over-hanging branches. Site furniture and steps will be maintained and replaced as needed, with tree safety work carried out as per the site risk assessment.

- Upgrade interpretation panels on the site by the end of the plan period to reflect any ongoing or new peatland restoration work on the site. Liaise with the Portmoak Community Woodland Group about the design and location of the new panels.

- Provide on-going engagement and support to the Portmoak Community Woodland Group throughout the plan period to develop and promote the Moss through facilitating a range of community events and learning opportunities for local schools.

4.2 f3 Semi Natural Open Ground Habitat

Description

Portmoak Moss is the remnant core of a lowland raised peat bog, surrounded (prior to restoration work) by a sheer face of cut peat 2-3m high around the perimeter. There are numerous deep drainage channels on both the raised and lower parts of the site.

The area is currently a mosaic of raised bog habitat consisting of heather, wavy hair grass, mosses (mainly sphagnum species) and bog cotton grass. In areas of standing water there is frequent sphagnum cuspidatum with sphagnum recurvum on pool edges. On somewhat drier areas there are frequent tussocks of sphagnum palustre and occasional sphagnum capillifolium and sphagnum fimbriatum. Sphagnum magellanicum has also been reported but is rare. There are also patches of cotton grass and cross-leaved heath. Broad-buckler fern is occasionally present in drier areas. The core area of the raised bog is surrounded with a variety of mature seed-bearing tree species-mainly downy birch, Sitka spruce, larch and Scots pine, which regenerate in varying number on the bog. There is abundant sporadic deadwood scattered across the site.

Restoring the degraded lowland raised bog on the site has been a focus for the site since the Woodland Trust took over ownership of the site. Historic restoration work has taken place over approximately 12 ha of the site and has included:

- 2000: compartment 3a was clearfelled of non-native conifers

- 2004: compartment 3b was clearfelled of non-native conifers and ditches were dammed with plastic piling dams

- 2005: compartment 3c was clearfelled of non-native conifers and additional dams were installed

- 2013: SNH report surveying peat depths, stability and advice for future management

- 2013-14: scrub clearance, spot weeding of cut stumps, stump mulching and the installation of 48 plastic piling dams was carried out thanks to the SNH Green Stimulus Peatland Restoration Fund

- 2015: PCWG secured funding from the Living Lomonds Landscape Partnership to commission a report considering management options for the site and to carry out reprofiling work on two exposed peat faces

- 2016: the Woodland Trust and PCWG jointly funded work to renew the eastern set of steps onto the raised bog and two sections of the steep and exposed perimeter face of the raised bog were reprofiled (compartments 2a and 8a)

- 2021: the western edge of the peat dome was reprofiled and trees close or on the edge of the bog were thinned

Restoration work over the last two decades has done much to improve water retention on the core area of the raised bog, which is an important carbon store. Ongoing monitoring of water levels (from two NatureScot loggers and 26 dipwells monitored by PCWG) show an overall increase in water levels post-restoration works. However, ongoing issues with scrub and tree regeneration across the open raised dome continue. Prolific tree regeneration, alongside the dominance of heather and wavy hair grass, suggest that the bog would benefit from further restoration to increase water retention, which will allow for greater sphagnum regeneration and suppress tree and scrub regeneration on the bog.

Significance

Lowland raised bogs capable of regeneration are an EU Annex 1 habitat and a UK BAP priority habitat. The rarity of raised bog as a habitat far outweighs the biodiversity value of the conifer plantation that would likely need to be felled to restore it. The raised bog habitat contributes to the overall site biodiversity and, if healthy, to carbon sequestration. The total volume of peat on the site is estimated to be 1,441,800m^3 and is estimated to store 57,000 tonnes of carbon.

Restoring the lowland raised bog meets the Woodland Trust Management Principle of protecting and conserving important semi-natural habitats.

Opportunities & Constraints

Opportunities:
-Lowland raised bogs are a rare habitat, in both a national and international context, and provide an important carbon store. Restoration at Portmoak presents an opportunity for Woodland Trust and PCWG to showcase a restoration project.
- To continue to work in partnership with relevant organisations (namely NatureScot) in raising water levels and further restoring the raised bog habitat.
- The restoration process presents an excellent opportunity to engage people in the practical management of the site (through events and interpretation).
- Restoration of the raised bog could considerably benefit the biodiversity of the site as a whole with a predicted increase in bog plants and invertebrate species.

Constraints:
- Historic peat cutting and drainage has severely damaged the raised bog habitat.

- Regeneration of birch and (to a lesser extent) mixed conifers in the existing open areas is often prolific and vigorous.
- Restoration of bogs is expensive and will demand external funding for it to be possible on the site.

Factors Causing Change

Climate change will continue to impact the ability of the bog to retain water, in particular during summer (as can be seen from dipwell monitors on the site).

Tree and scrub regeneration will continue to be an issue if the site cannot be adequately re-wetted.

Long term Objective (50 years+)

The raised bog will be restored to a functioning habitat, where water levels are consistently high enough year-round for sphagnum to regenerate. Water levels will be high enough that the growth of any scrub or tree regeneration in the area will be supressed, making ongoing removal of regeneration a manageable task for local volunteers or contractors.

The Woodland Trust will continue to work with NatureScot and other experts in peatland restoration to continually monitor the site (primarily water levels through dipwells). The Portmoak Community Woodland Group and other local volunteers will continue to play a role in day-to-day management and community engagement.

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

During the period of this plan:

- Continue to remove small tree and scrub regeneration by hand where possible. This programme of works will primarily be led by Portmoak Community Woodland Group and supported by Woodland Trust, who will facilitate opportunities for corporate groups to volunteer on the site.

- Trial more efficient ways to manage regenerating birch on the raised bog area by trialling cutting and treatment of stumps in the western parts of compartment 3a where birch is too big to be removed by hand (2024). The success of this approach will be monitored in 2025.

- Trial ringbarking a select number of regenerating birch trees on the raised bog area in compartments 3a and 3b (2024). Primarily led by volunteers, trees will be ringbarked, marked and monitored annually to see if this approach is successful.

- Further management interventions for the remainder of the plan period will be determined by the expert advice provided by Peatland Action and from the funding options available.

- Maintain all existing plastic dams until discussions with Peatland Action have identified future management options, whereby more modern techniques of creating dams from peat and timber may be recommended to replace plastic dams which are prone to leaking or failure over time.

- Volunteers will continue to undertake dragonfly and aquatic invertebrate monitoring on the bog. The Woodland Trust will continue to work in partnership with the British Dragonfly Society.

- PCWG volunteers will continue to regularly monitor dipwells on the raised bog and look to install a handful of new dipwells in areas where there is limited data collection, in particular around the edges of the dome (2024). Woodland Trust will continue to facilitate data downloads of NatureScot's water level monitors on the bog.

4.3 f4 Long Established Woodland of Plantation Origin

Description

Two areas of woodland (compartments 5a and 7a) are shown as Long Established Woodland of Plantation Origin (LEPO 2b) in the NatureScot Ancient Woodland Inventory (AWI). However, the 1856 1st edition OS map shows that some other parts of the site could also be classed as LEPO, including parts of compartments 1a, 2a, 4a and 8a.

The 1856 map shows the woodland areas with straight edges defined by drains (all of which are still present) and are most likely early 19th century attempts to provide drainage and shelter belts to improve grazing quality. The current canopy is defined either by 1960s conifer planting or by semi-natural birch that has regenerated where conifer establishment has failed. There is also the occasional older, mature Scots pine or birch that pre-dates Forestry Commission planting.

The ground flora in these compartments does not vary significantly from that in the rest of the wood, being defined by grasses and broad-buckler fern (approximately NVC W4a) in the more open areas and bare ground under the denser conifers. The older ditches are valuable in that they are likely to be a refuge for remnants of the semi-natural bog vegetation present before drainage and tree planting impacted the site.

Significance

The woodland is on the NatureScot Ancient Woodland Inventory (AWI) as LEPO 2b and has existed since at least 1856, which indicates the potential for a relatively high biodiversity potential in comparison to the rest of the woodland on the site.

Opportunities & Constraints

Opportunities:
- Biodiversity value of the LEPO areas, in particular where they are composed of native woodland, will be considered when discussing management interventions with Peatland Action to restore the raised bog.

- Consider alternative management interventions such as coppicing trees close to the raised bog area to reduce seed source.

Constraints:
- Some areas of conifers within LEPO areas are on deep peat and are likely to suffer windblow.
- Management access is restricted on deep peat.

Factors Causing Change

Some conifers are increasingly susceptible to windblow and wind snap.

Long term Objective (50 years+)

To create and maintain a diverse, mixed age and mixed species woodland habitat in perpetuity with secure and developing the ancient woodland communities. Species will be predominantly broadleaved with birch the main canopy tree, approximating to NVC classes W4, W16 / W17, with a ground flora of grasses and ferns.

Some conifers will be retained where possible (windblow permitting), however if recommendations from Peatland Action suggest that felling areas will benefit the bog re-wetting, this will be considered.

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

- Minimum intervention in these areas is anticipated within the plan period, dependent on recommendations from Peatland Action (2024) and will be reviewed in line with their recommendations.

- Consider alternative management options for seeding trees close to the raised bog area if the Peatland Action recommendations suggest that this would be beneficial, eg. coppicing.

4.4 f5 Secondary Woodland

Description

The secondary woodland (compartments 2a, 4a, part of 5b, 5c, 6a, part of 6b, 8a) consist mainly of un-thinned mixed commercial conifer stands planted between 1960 and 1963. The main species are Sitka spruce and Scots pine, with some Norway spruce, lodgepole pine, hybrid larch, and the occasional grand and noble fir. Sporadic patches of regenerating downy birch are found throughout. The occasional mature Scots pine can also be found which predates the 1960s planting. Poorly drained deep peat, combined with a lack of thinning and the crops reaching commercial maturity have produced closely-spaced stands which have become very susceptible to windblow. The Sitka and Norway spruce are particularly vulnerable and pockets of windblow are found throughout many areas of the commercial conifers. Standing and lying deadwood is frequent to abundant in the un-thinned conifer areas.

Ground flora is almost absent under the dense stands of spruce, and in more open areas is dominated by common damp woodland species (NVC classes W4 and W16) such as broad buckler fern, wavy hair-grass and mosses, including

remnants of various sphagnum species. In the drier areas on the raised peat there are patches of blaeberry and heather in more open woodland and bracken and bramble on woodland edges.
The broadleaved woodland component consists predominantly of wet woodland (W4) and W16/W17 and some W18 type woodland; mainly downy birch with the occasional oak, rowan, willow and sycamore. Many of these are trees that have regenerated in open areas where the conifers did not establish well, there are also scattered mature trees present which predate the conifers. An area in the southeast of the site (compartment 1b) is now showing dense downy birch regeneration following clearance of windblown conifers in 1999. Secondary woodland has also become established in compartment 3c and parts of 8a.

Significance

The woodland has value locally in an area otherwise dominated by agriculture and is well used by the local community. The woodland habitat supports a small colony of red squirrels and woodland birds.

Opportunities & Constraints

Opportunities:
- To improve the biodiversity value of the woodland areas through natural regeneration of native species in wind-damaged areas of conifers.

- To remove remaining areas of conifers on the raised bog area in compartments 3c, 4a, 5a, 5b and 5c to maximise the restoration potential of the bog.

- Clearfelling areas of conifer plantation would allow for regeneration of native tree species and for the potential of wider raised bog restoration by allowing for a lagg fen habitat to naturally establish in felled areas close to the bog.

Constraints:
- Wind damage is a constant potential threat in all un-thinned and commercially mature conifer areas growing on deep peat.
- Restricted management access will make potential harvesting and extraction difficult.
- Browsing by deer may reduce natural regeneration in places (although some amount of grazing pressure is perhaps not a bad thing when establishing a lagg fen habitat).

Factors Causing Change

Frequent windblow.

Long term Objective (50 years+)

To create and maintain diverse, predominately native, broadleaved woodland with a mixed conifer component, with a diverse range of age classes. It will be an open woodland area largely allowed to establish naturally through regeneration after areas of woodland are clearfelled. Downy birch will be the main canopy tree, representative of NVC classes: W4, W16, W17 and W18, with a ground flora mainly composed of grasses, ferns and mosses.

Bog restoration permitting, some scattered stands of existing mixed conifers will be retained in places and open woodland allowed to naturally establish through regeneration within areas of clearfell.

There will be more open ground habitat as replanting will not take place on deep peat, although natural regeneration will be allowed. The transition of the site from commercial conifer to mixed native woodland will focus on areas highlighted in the Peatland Action recommendations and those which are increasingly vulnerable to large scale windblow.

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

During the plan period:

- Dependent on the recommendations from Peatland Action (2024), considerable clearfell will likely take place across the site to facilitate restoration work. It is anticipated that compartments 2a, 3c, 4a and parts of 5b and 8a will be clearfelled within the current plan period and not replanted due to deep peat in these areas. Re-wetting works through additional contour bunding on these areas will be considered (subject to Peatland Action recommendations) to further slow the movement of water off the core raised bog area, which could allow for a lagg fen to naturally establish around the perimeter of the bog.

- Dependent on Peatland Action's recommendations, naturally regenerated woodland areas in compartments 1a and 1b will be retained and will be managed with minimal intervention.

- Parts of compartment 1b (where the open ground wayleave is) will continue to be retained as open ground for the benefit of the colony of small pearl boarded fritillary butterfly.

- PCWG volunteers will continue to monitor every year several small areas of Himalayan balsam in compartments 8a and 1a (along the site boundary). PCWG volunteers will arrange volunteer work days where necessary to remove it in summer before seeding.

Appendix 1 : Compartment Descriptions

Cpt No.	Area (ha)	Main Species	Year	Management Regime	Major Management Constraints	Designations
1a	1.11	Birch (downy/silver)	2000	Min-intervention	Mostly wet ground/exposed site	
Ground conditions: peaty, extremely wet with deep water-filled ditches. The ground was heavily disturbed during conifer clearance in 1999. The predominant species is naturally regenerated downy birch with occasional goat willow, grey willow and rowan, with occasional mature trees and coppice regrowth. NVC type, predominately: W4 Wet Woodland with a narrow strip of W17 oak - birch woodland along the eastern boundary. An obsolete wayleave (powerline) cuts through a part of the sub-compartment. A stacking/turning area for the site lies on the northern edge of this block. A narrow strip of mature oak, pine and spruce forms the eastern boundary of the site. Occasionally a mature conifer blows over, although the strip as a whole has remained firm, providing shelter and an attractive visual screen to the naturally regenerating wet woodland area in 1b. The ground flora beneath the birch consists of abundant mosses and grasses, frequent ferns and mosses, with frequent marsh and dog violet, and common sorrel Ground flora is less prevalent beneath the conifers. There is occasional regeneration of downy birch. There is ample deadwood due to the occasional windblown conifer in the strip on the eastern boundary.						
1b	4.54	Birch (downy/silver)	2000	Min-intervention	Mostly wet ground/exposed site	
Ground conditions: peaty and extremely wet with deep water-filled ditches. The ground was heavily disturbed during conifer clearance in 1999. Naturally regenerated downy birch predominates along with the occasional goat willow, grey willow and rowan. Regeneration is dense throughout most of the site. There is a scattered overstorey of mature downy birch on the western side of the sub-compartment. An obsolete wayleave (powerline) of open ground bisects the sub-compartment-this is an important breeding and feeding area for small pearl boarded fritillary. Regenerated trees around the open ground area were cut back and the edges scalloped and debris mulched in 2014. A new strip of open ground parallel to the existing was created at the same time to improve and expand the habitat. The vegetation community that developed following clearfelling was predominantly NVC M23 Juncus effusus/acutiflorus-Galium palustre rush-pasture, overwhelmingly dominated by Rushes (Juncus effusus) with abundant grasses consisting of: Yorkshire fog (Holcus lanatus), velvet bent (Agrostis canina), wavy hair-grass (Deschampsia flexuosa) and tufted hair-grass (Deschampsia cespitosa). There was also frequent common sorrel (Rumex acetosa). For several years following clearfell rosebay willowherb (Chamaenerion angustifolium) and brambles (Rubus ideaus and Rubus fruticosus) were locally abundant-these species are often associated with disturbed ground and persisted on the site for several years afterwards. The rosebay and bramble have gradually disappeared as light levels change and a dense canopy of natural regenerated trees has become established. As a result of this change mosses are now more abundant across the site. Some grasses, soft rush and common sorrel have continued, whilst marsh and dog violets have increased in abundance-especially in and around areas of light woodland and open ground (the old wayleave). Much of the woodland in this compartment has developed into NVC type W4 Wet Woodland. Deer browsing has not prevented regeneration in this area-although roe deer are frequently seen. Deadwood is currently limited to gradually decaying mature trees, snapped off boughs and the occasional windblown tree.						
2a	5.67	Sitka spruce	1960	High forest		
An area of mature unthinned mixed conifers, predominated by Sitka spruce. This compartment is on the lower peat level and is relatively well-drained in places. It is bounded on the west by the reprofiled (2016) peat-face and by the timber extraction route to its north. The major part of the compartment consists of an intimate mix of Sitka spruce						

Cpt No.	Area (ha)	Main Species	Year	Management Regime	Major Management Constraints	Designations
and Scots pine. The pine has been completely suppressed by the spruce and is very drawn up and moribund. Hence, many of the pines are standing dead and there is frequent wind snap. This has had the effect of a self-thinning, resulting in the Sitka spruce being well drawn up and of reasonable form. There are a few broadleaves scattered throughout the crop (mainly naturally regenerated mainly downy birch). Towards its eastern edge, the canopy consists of mature Norway spruce and downy birch. The north-eastern lobe of the compartment consists almost entirely of Sitka spruce. Sporadic windthrow has occurred throughout the compartment in recent times and is highly likely to intensify. The combination of: a generally deep peaty soil, a high water table, a lack of thinning and the rotational age of the trees will ensure that crop stability continues to decrease. As a result, the risk of a large scale windblow event occurring will continue to increase. It is important that the crop is clearfelled before this occurs. The standing timber resource is currently estimated at approximately 340 cubic metres/ha. There is little or no ground flora or understorey under the dense canopy. Wood sorrel and several mosses are frequently found. In lighter areas to the west there are occasional grasses and frequent ferns. Spruce seedlings occur throughout, although lack of light prevents their establishment. Aerial and fallen deadwood is abundant due to the large amount of standing and fallen dead pine and pockets of windblow.						
3a	6	Open ground	2005	Non-wood habitat	Mostly wet ground/exposed site, Sensitive habitats/species on or adjacent to site	
Forms a significant part of the core area of the raised bog peat dome. The site was clearfelled of commercial conifers in 2000. Ground vegetation was almost absent following clearfell but soon developed, over time into a mosaic of wavy hair-grass (Deschampsia flexuosa), mosses (mainly sphagnum species), cotton grass (Eriophorum angustifolium), soft rush (Juncus effusus) and heather (Calluna vulgaris). Dense downy birch, Sitka spruce and a few pine began to colonise many areas, particularly at the edges of the cleared area and began to threaten the raised bog open ground habitat- over time much of this has been controlled, prolific seeding from surrounding mature trees continues to offer a threat to the long term. Deadwood is scattered across the site and present in the form of: a few standing dead pines, decaying lop and top from scrub control and numerous conifer stumps from the original clearfell. Since tree clearance a variety of works has been undertaken to help improve the raised bog habitat. These include: damming, tree and scrub clearance and control, surface mulching, drain bunding and infilling and reprofiling of the eastern edge of the exposed steep cut face of the raised bog. The signs are promising, there has been a gradual rise in the water table. Increasing water levels further will help to control seeding scrub. Sphagnum species have shown a strong recovery over parts of the site. In areas of standing water there is frequent sphagnum cuspidatum with sphagnum recurvum on pool edges. On somewhat drier areas there are frequent tussocks of sphagnum palustre and occasional sphagnum capillifolium and sphagnum fimbriatum. Sphagnum magellanicum has also been reported but is rare. Large swathes of drier ground remain scattered throughout. The largest area of which is located in compartment 3b. These areas are dominated by grassland species such as: wavy hair-grass (Deschampsia flexuosa), tufted hair-grass (Deschampsia cespitosia), Yorkshire fog (Holcus lanatus), creeping soft grass (Holcus mollis), and purple moor grass (Molinia caerulea) with occasional heather and broad-buckler fern (Dryopteris dilitata). The on-going programme of works has helped the water level to rise and spread across parts of the site. There is abundant deadwood across the site in the form of several standing dead pines, decaying brash and lop and top and numerous conifer stumps.						

Cpt No.	Area (ha)	Main Species	Year	Management Regime	Major Management Constraints	Designations
3b	5.37	Open ground	2005	Non-wood habitat	Management factors (eg grazing etc), Mostly wet ground/exposed site, Sensitive habitats/species on or adjacent to site	

Part of the core raised bog peat dome, and bounded by the cut peat-face along its south-western edge. All the commercial conifers (Sitka spruce and lodgepole pine, planted 1960) were removed in 2004. Ground vegetation was almost absent following clearfell but soon developed, over time into a mosaic of wavy hair-grass (Deschampsia flexuosa), mosses (mainly sphagnum species), cotton grass (Eriophorum angustifolium), soft rush (Juncus effusus) and heather (Calluna vulgaris). Dense downy birch, Sitka spruce and a few pine began to colonise many areas, particularly at the edges of the cleared area and began to threaten the raised bog open ground habitat- over time much of this has been controlled, prolific seeding from surrounding mature trees continues to offer a threat to the long term. Deadwood is scattered across the site and present in the form of: a few standing dead pines, decaying lop and top from scrub control and numerous conifer stumps from the original clearfell.

Since tree clearance a variety of works has been undertaken to help improve the raised bog habitat. These include: damming, tree and scrub clearance and control, surface mulching, drain bunding and infilling and reprofiling of the eastern edge of the exposed steep cut face of the raised bog. The signs are promising, there has been a rise in the water table. Increasing water levels further will help to control seedling scrub. Sphagnum species have shown a strong recovery over parts of the site. In areas of standing water there is frequent sphagnum cuspidatum with sphagnum recurvum on pool edges. On somewhat drier areas there are frequent tussocks of sphagnum palustre and occasional sphagnum capillifolium and sphagnum fimbriatum. Sphagnum magellanicum has also been reported but is rare.

Large swathes of drier ground remain scattered throughout with the largest grassland area is found in this compartment and is dominated by acidic loving grassland species such as: wavy hair-grass (Deschampsia flexuosa), tufted hair-grass (Deschampsia cespitosia), Yorkshire fog (Holcus lanatus), creeping soft grass (Holcus mollis), purple moor grass (Molinia caerulea) with occasional heather and broad-buckler fern (Dryopteris dilitata).

The on-going programme of works has helped the water level to rise across parts of the site.

There is abundant deadwood across the site in the form of several standing dead pines, decaying brash and lop and top and numerous conifer stumps.

On the drier areas (especially to the east of the sub-compartment) there are frequent tussocks of sphagnum palustre and occasional sphagnum capillifolium and sphagnum fimbriatum. Sphagnum magellanicum has also been reported but is rare. There are also rare patches of cotton grass (Eriophorum angustifolium and E. vaginatum) and cross-leaved heath (Erica tetralix). Broad-buckler fern (Dryopteris dilitata) is occasionally present in drier areas.

3c	2.98	Birch (downy/silver)	2005	Min-intervention	Gullies/Deep Valleys/Uneven/Rocky ground, Management factors (eg grazing etc), Mostly wet ground/exposed site, Sensitive habitats/species on or adjacent to site	

Clearfelled in 2005. The area is bounded: on the east by the cut face of the peat; to the south by larch in compartment 5c; to the west by major drainage ditches; to the north-west by the open mature pine woodland of

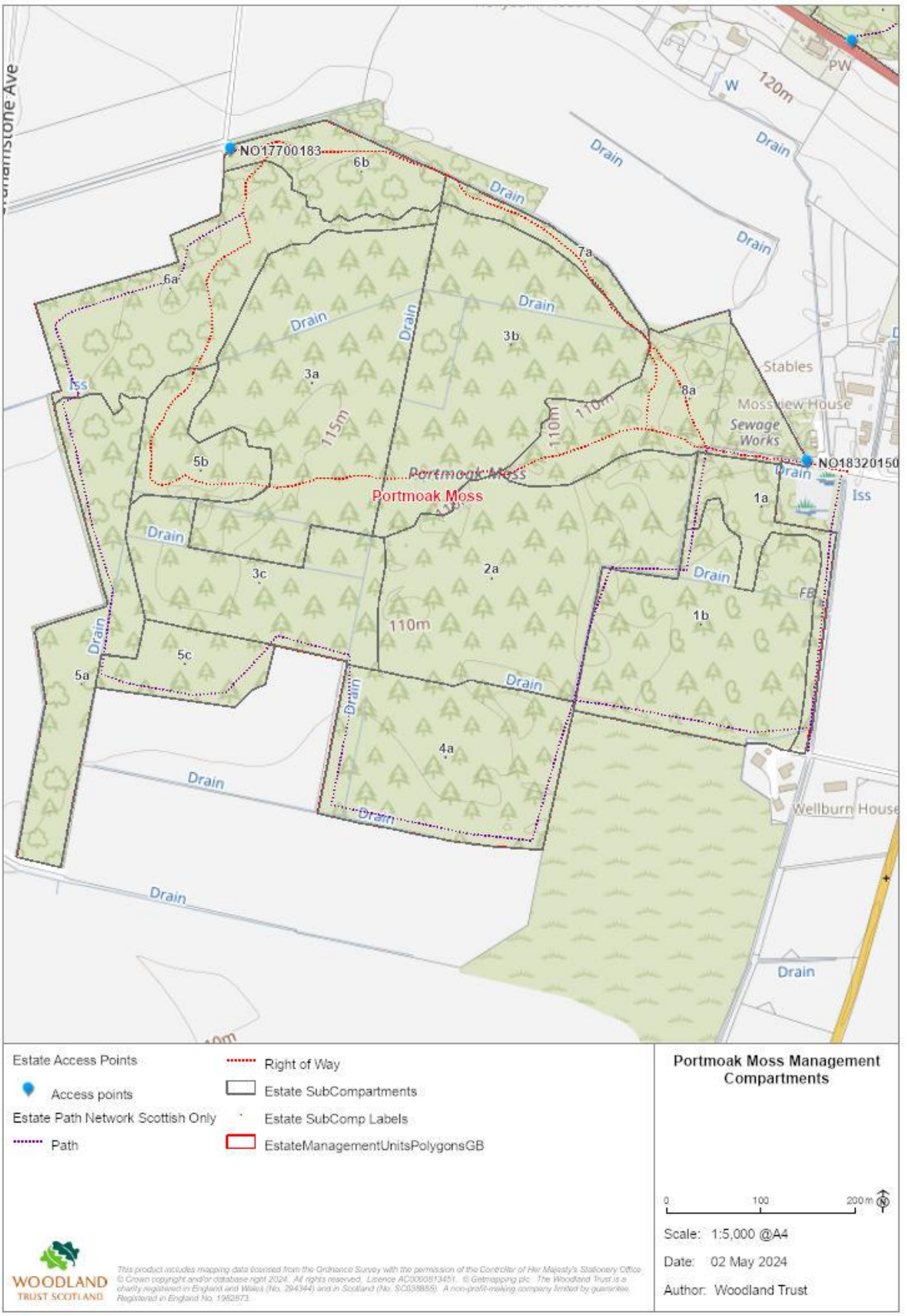
Cpt No.	Area (ha)	Main Species	Year	Management Regime	Major Management Constraints	Designations
compartment 5b. To the north it marches with the central area of raised bog (sub-compartments 3a and 3b). A narrow belt of larch has been left to the south on the southern edge, along the perimeter of the wood. Although numerous dams were installed in the main drains, the water table did not rise as anticipated. As a result, sphagnum recovery, post felling, has not been as successful as in compartment 3. The majority of sphagnum moss is focused around the main drainage channels-all of which have been dammed. Post felling, the site did however, provided ideal conditions for the natural regeneration of tree species to occur and tree seeding was prolific: dense downy birch, Sitka spruce, pine, larch and willow from the surrounding mature trees successfully colonised the whole site right up to the northern drain boundary and is now extremely well established and have closed canopy. Other trees found on site include: a few over-mature pine in the centre of the area and the mature larch strip to the south. There is abundant deadwood in the form of windblown larch, decaying brash and conifer stumps. The area surrounding the dammed main drains is important for sphagnum and other bog species. Whilst the deep water filled drains within subcompartment 3c provide essential habitat for aquatic invertebrates, especially Odonata species.						
4a	4.03	Sitka spruce	1960	High forest	Management factors (eg grazing etc), Mostly wet ground/exposed site, No/poor vehicular access to the site	
This sub-compartment adjoins the southern edge of sub-compartment 2a and is a dense mixed conifer stand, consisting mainly of an intimate mix of unthinned and drawn up Sitka spruce and lodgepole pine, with occasional pockets of windblow, increasing along the south and eastern boundaries. Within this matrix there are more open groups of downy birch and occasional Scots pine and Norway spruce. Underneath the spruce there is virtually no ground flora. In lighter areas ground flora is frequent to abundant with grasses (mainly Deschampsia flexuosa) and broad-buckler fern (Dryopteris dilitata). There is an abundance of deadwood due to the suppressed lodgepole pine-much of which is standing dead or snapped and fallen. The compartment is partly on the raised peat area, but is surrounded by deep ditches on all four sides, so that it is separated, in a hydrological sense, from the main raised peat area and is drier in parts than sub-compartment 2a. In the west of the compartment the peat surface is disturbed with various hummocks and hollows. A combination of: a wet peaty soil, lack of thinning, and the rotational age of the trees will ensure that crop stability continues to decrease and sporadic windthrow is highly likely to intensify. As a result, the risk of a large scale windblow event occurring will continue to increase. It is important that the crop is clearfelled before this occurs. Management access to this sub compartment is limited and is via sub compartment 2a. The standing timber resource is currently estimated at approximately 340 cubic metres/ha.						
5a	2.87	Birch (downy/silver)	1963	High forest	Management factors (eg grazing etc), Mostly wet ground/exposed site, No/poor vehicular access to the site	
A long narrow compartment forming the western boundary of the woodland. The compartment sits on the edge of the raised bog and is bounded by the cut peat-face to the north east. It is bounded by ditches on all other sides. In the centre of the compartment a belt of hybrid larch stretches west from compartment 5c, but to the north and south of this belt most of the compartment consists of an open mix of semi-mature downy birch and grand fir. Many of the grand fir have died standing although the remainder appear healthy. In the far north of the compartment there is a small block of mature Norway spruce. Under the open birch/fir woodland there is regeneration of birch						

Cpt No.	Area (ha)	Main Species	Year	Management Regime	Major Management Constraints	Designations
and the occasional conifer and a ground flora of wavy hair-grass (Deschampsia flexuosa) and broad-buckler fern (Dryopteris dilitata), with strong bracken growth along western edge. Browsing damage is low. There is currently only the occasional windblown tree, although there is frequent deadwood from standing and fallen grand fir. The whole sub-compartment is shown as Long-Established Woodland of Plantation Origin (LEPO) on the NatureScot Ancient Woodland Inventory and is visible as a shelter belt planted between ditches on the 1856 1st edition OS map. As such there is a minor threat to AW communities from shade/wind blow, however ground flora is abundant.						
5b	1.26	Scots pine	1963	High forest	Gullies/Deep Valleys/Uneven/Rocky ground, Management factors (eg grazing etc), No/poor vehicular access to the site, Sensitive habitats/species on or adjacent to site	
A block of mixed woodland of predominately Scots pine on a generally dry area of the raised bog. Bounded to the south west by sub-compartment 5a and to the north-west by the cut peat-face running along the edge of sub compartment 6a and on all other sides by the open ground of the core area of raised bog. The southern part consists of Scots pine and downy birch; this is an important feeding area for red squirrel and an attractive route along the path. To the north there is a small area of unthinned Sitka spruce interspersed with Scots pine -planted in 1963. Beneath the unthinned conifers there is little ground flora, but in the more open pine-birch areas there is frequent heather (Calluna vulgaris) and blaeberry (Vaccinium myrtillus), broad-buckler fern (Dryopteris dilitata) and wavy hair-grass (Deschampsia flexuosa). This approximates to a mosaic of NVC type W16, whilst the pine-birch mix is more familiar in appearance to NVC type W18. Occasional mosses present include Dicranum scoparium, Polytrichum commune and Pleurozium schreberi. Surviving raised bog vegetation includes rare patches of common cotton-sedge (Eriophorum angustifolium) and significant patches of sphagnum species. There is frequent birch regeneration in the more open areas, which does not seem to have suffered undue browsing. There is frequent deadwood in the form of windblown trees.						
5c	1.12	Hybrid larch	1963	High forest	Gullies/Deep Valleys/Uneven/Rocky ground, No/poor vehicular access to the site	
Open woodland (80% canopy) of hybrid larch with occasional downy birch regeneration in parts on the southern boundary of the site. The larch has suffered much windblow in the past. However, it now provides a relatively wind firm edge to the boundary. Ground vegetation consists mainly of grasses and ferns in denser areas and bracken in more open areas. There is abundant deadwood as a result of decaying windblown larch. This area of the site is fairly well-drained due to the deep boundary ditch to its south.						
6a	3.56	Mixed conifers	1963	High forest	Management factors (eg grazing etc), Mostly wet ground/exposed site, No/poor vehicular access to the site	

Cpt No.	Area (ha)	Main Species	Year	Management Regime	Major Management Constraints	Designations
A block of mainly conifer woodland forming the north west boundary of the site. Most of which is on the lower peat level, although a narrow belt of trees sits along the western face of the raised bog. To the south part of the area is bounded by a reprofiled area of the raised bog. The western part of the sub-compartment is shown as woodland on the 1857 1st edition OS map (although not shown as LEPO on the NatureScot Ancient Woodland Inventory). The canopy consists mainly of a mix of mature Scots pine and Sitka spruce in the west (planted 1963) with frequent groups of mature downy birch (particularly along the edges). The rest of the compartment is more mixed with frequent Sitka spruce, Norway spruce, lodgepole pine and downy birch. There is occasional windblow. Most trees appear wind firm on this drier and lower ground. Beneath the birch there is abundant wavy hair-grass (Deschampsia flexuosa) and frequent broad-buckler fern (Dryopteris dilitata), although little tree regeneration. There is little ground flora beneath the conifers. There is occasional dead wood from windblown trees. Minor threat to AW communities from shade, however this is limited by the canopy being opened up from the occasional windblown tree.						
6b	1.37	Birch (downy/silver)	1963	Min-intervention	Mostly wet ground/exposed site, No/poor vehicular access to the site	
A varied compartment on the lower peat level, forming the northern boundary to the wood and containing the most diverse area of mixed broadleaves within the site. The canopy consists mainly of mature and semi-mature downy birch but also includes sycamore, ash and rowan. There is also a small strip of Norway spruce and sycamore along part of the northern boundary. The ground flora consists mainly of grasses and ferns with wild raspberry in more open areas and is typical of NVC classes W4 and W16.There is occasional broadleaved (birch) regeneration where light levels allow and frequent deadwood.						
7a	0.53	Birch (downy/silver)	1963	Min-intervention	Management factors (eg grazing etc), Mostly wet ground/exposed site	
A narrow belt of open broadleaved woodland, on the edge of the core area of the raised bog, which forms the northern boundary of the site. The canopy is mainly mixed aged birch with occasional rowan and grey willow. Birch seedling regeneration from this strip of woodland onto the raised bog has been a nuisance in the past and requires frequent monitoring. The ground flora comprises of: abundant wavy hair-grass (Deschampsia flexuosa) with frequent broad-buckler fern (Dryopteris dilitata) and occasional patches of bramble and bracken. There is occasional dead wood. This sub-compartment is shown as woodland on the 1857 1st edition OS map and is shown as Long Established Woodland of Plantation Origin (LEPO) on the NatureScot Ancient Woodland Inventory.						
8a	2.86	Scots pine	1963	High forest	Gullies/Deep Valleys/Uneven/Rocky ground, Mostly wet ground/exposed site	
Mature conifer woodland (planted 1963) on the lower peat level, bounded on the west by the reprofiled (2016) peat-face, and to the south by the extraction route and stacking area and the site boundary to the north-east. A deep water filled ditch bisects north-south through the eastern side of the sub compartment. The area to the west of the ditch is a mixture of very well grown; commercially mature Sitka and Norway spruce, which was thinned in 1999 and 2004 to improve stability. Several large pockets of windblow have occurred amongst the mature Sitka and Norway spruce since it was last thinned. The windblown area within the spruce will gradually increase in size and						

Cpt No.	Area (ha)	Main Species	Year	Management Regime	Major Management Constraints	Designations
spread. The long-term stability of the remaining Sitka and Norway spruce is at risk. The standing timber resource is currently estimated at approximately 340 cubic metres/ha. The area is shown as open woodland on the 1856 1st edition OS map, although it is not shown on the NatureScot Ancient Woodland Inventory. The remainder of the compartment consists mainly of an intimate mix of predominately Scots pine, Sitka spruce and downy birch. The pine is reasonably stable and has self-thinned over time. Patches of mixed aged birch fringe the reprofiled peat-face and there are dense patches of birch regeneration in places. There are also occasional older, more mature, Scots pines that pre-date the FC planting. In the pine/birch areas there is occasional windblow. Under the dense spruce there is much bare ground, but in lighter areas there is frequent broad-bucker fern (Dryopteris dilitata), grasses and common mosses. Dead wood is evident throughout, especially in the pure spruce areas, in the form of windblown and standing dead trees						

Appendix 2 : Compartment Map



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.

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