Forestry and Land Scotland
Coilltearachd agus Fearann Alba

Appendix II – Land Management Plan Consultation Record

II/1. Pre-planning community and stakeholder engagement (2021-22)

Table 15 – Responses to pre-planning stakeholder engagement (mainly covering the Hartwood woodland creation area). Responses are amalgamated by subject area (e.g. recreation, biodiversity) and between online and in-person feedback.

Consultee	Date Contacted	Date responded	Comment/Issue Raised	FLS Central Region Response
Local residents/neighbours	July 2022	N/A	Widespread support for woodland creation at the scale outlined during engagement [potentially the whole Hartwood site - up to circa 270ha]. Support for a range of objectives and species including mixed conifer, broadleaved and productive woodland.	Pleased to receive a wide level of support for large-scale woodland creation at an early stage.
Local residents/neighbours	April - July 2022	N/A	Some interest/concerns about potential landscape impact of woodland creation on local views, especially looking from Hartwood towards Allanton.	Where significant local views have been identified these have been considered as part of the LMP design. Visualisations have been prepared for the most significant viewpoints (e.g. around Hartwood Village).
Local residents/neighbours	July 2022	N/A	Widespread interest in potential recreation routes – especially linking Hartwood to Shotts; and amenity value of new woodland.	Open space has been incorporated into the design to allow continued access as the new planting and restocked areas mature. Majority of lower slopes designed with high levels of amenity in mind, especially around Hartwood village.
Local residents/neighbours	July 2022	N/A	Widespread interest in maintaining and improving biodiversity and establishing new native woodland.	All existing biodiversity interests have been considered as required, significant areas of new native woodland are proposed and the proposed design has been

				developed in close collaboration with FLS Regional Environment team.
Local residents/neighbours	July 2022	N/A	Some concerns raised about vehicle traffic, especially relating to existing farm access.	New access points are proposed as existing access through farmyard is not considered suitable for long-term use.
Local residents/neighbours	July 2022	N/A	Some interest expressed in type of trees to be planted and density of planting.	LMP details proposed species and stocking densities. Species have been selected to match site objectives, landscape and soil/climate type; proposed densities are based on industry standards and published guidance to meet required objective(s).
Local residents/neighbours	July 2022	N/A	Some interest raised in community development/asset transfer/partnership working.	Happy to consider options for Community Asset Transfer, partnership working, potential community lease or other projects. Any interested parties should contact enquiries.central@forestryandland.gov.scot or the local Community Ranger in the first instance, ideally as a part of a coordinated group (e.g. Hartwood Community Development Group).

II/2. Draft Land Management Plan consultation (2023)

Table 16 – Responses to draft Land Management Plan proposals (covering whole LMP area).

Consultee	Date Contacted	Date responded	Comment/Issue Raised	FLS Central Region Response
Local residents/neighbours (including members of the local farming community)	11/10/2023	07/11/2023	Widespread support for proposals expressed at community consultation event held at Allanton. It was noted that one resident appeared unhappy with proposals for new woodland but no specific feedback on our plans was given by this individual. The following summary was recorded by our Visitor Services Team: *Total attendance 15 people* [the majority of which were local residents from the Hartwood and Bowhousebog areas, in addition to two local Councillors]. *Feedback* • *All feedback was generally positive about the plans to plant trees in the area,* • *There was a number of people interested in access and how they could use the site once it was planted, it was explained that no formal paths in the current plan, but grass rides would be left open for them to use and allow the site to establish. We would be willing to work with the community in the future to look at paths on site.* • *The need for a discussion on parking for visitors to the site in years to come was raised as the community have already had some issues with parking for visitors walking at the former Hartwood Hospital.*	We are grateful to all those who took time to attend the consultation event and were pleased that there was widespread support for our proposals; including from residents who had previously expressed concerns about the potential impact to local views and from members of the Hartwood Community Development Group, Friends of Hartwood Paupers Cemetery, and local Councillors.
Local Resident	11/10/2023	07/11/2023	What is your connection to the area? *Local resident – Hartwood/Bowhousebog*	*Thank you for your comments, it is good to receive positive feedback on our proposals. Regarding the*

(Response to online form)			What aspects of the Land Management Plan are you most interested in? *Wildlife/Biodiversity* What do you most like about the plan, and why? *The wide variety of trees, and tree mixes and planting density. A good long term plan.* Is there a part of the plan that you would like to see improved, if so how? N/A Do you have any specific concerns about these proposals (e.g. impacts on a private water supply)? *There is knotweed around Hartwood Home Farm. Will these clusters be cleared properly?* Please add any further comments relating to the plan here. *Love the plan. Also part of the Friend's of Hartwood Paupers Cemetery.*	*Japanese knotweed, I can confirm that we are aware of this issue and will be implementing a program to control and where possible eradicate populations within our landholding.*
Historic Environment Scotland	11/10/2023	12/10/2023	*Thank you for your forestry consultation below in relation to the above Land Management Plan.* *We have considered your consultation and comment as follows:* *Historic Environment Scotland is the lead public body established to investigate, care for and promote Scotland's historic environment. Our comments here concentrate on our statutory remit for world heritage sites, scheduled monuments and their setting, category A-listed buildings and their settings, and historic battlefields and gardens and designed landscapes appearing in their respective Inventories.*	Noted, thank you for your comments.

			We note that there are no scheduled monuments, category A-listed buildings or Inventory gardens and designed landscapes within the boundary of the Land Management Plan and therefore we have no locus regarding this consultation. *You may also wish to seek information and advice on matters including impacts on unscheduled archaeology and category B and C listed buildings from your local authority's archaeology and conservation services if you have not already done so.* *If we can be of further assistance please do not hesitate to contact us.*	
NatureScot	11/10/2023	20/10/2023	*We do not intend to offer formal comment on this proposal as it falls below the Scottish Forestry and Statutory Consultees Joint Working Agreement for forestry related casework. In general, NatureScot will focus on guidance, standing advice and early engagement. Inputs to individual applications will usually be restricted to those that could significantly affect protected areas.*	Noted, thank you for your comments.
Rural Payments and Inspections Division (SGRPID)	11/10/2023	27/10/2023	*Dear Central Region Planning Team,* *In response to your email regarding the regarding the Hartwood Woodland Land Management consultation I would like to provide some feedback.* *The plan covers an area of 522ha (5.22km) within North Lanarkshire in Central Scotland. It is located immediately West of Shotts, on the North side of the A71 around the villages of Hartwood and Bowhousebog.*	This response is not reflective of RPIDs previous comments regarding the proposed planting of this site, which were submitted in 2019 and supported the objective for large-scale woodland creation. We would agree with they key finding that no parts of the site are classed as 'prime agricultural land'. We would disagree that the proposal would be considered 'large' on the basis that it would remove more than 10% of LCA types 1-4 from the local area. As

			The majority of the land in the plan for woodland creation is Land Capability for Agriculture (LCA) grade 4.1 and 4.2, this is good agricultural land that is capable of grazing livestock and producing a narrow range of crops. From arial photography, we can see that some of the parcels have been cut for forage production in recent years, and some of the land looks to have been improved. It would be detrimental to local agriculture for those parcels to be taken out of food production, therefore RPID would not support any of the Region 1 land parcels to be planted. The plan includes approximately 150 ha of existing woodland to the North. Contiguous to this there is some Region 2 rough grazing land, of which we would support planting. *Looking at recommendation 3 of the "REPORT OF THE WOODLAND EXPANSION ADVISORY GROUP" which is to help reduce conflicts with other land uses:* *• The focus of woodland expansion should be away from prime agricultural land. Although this land is not considered prime it is still capable of producing a range of crops and good quality grazing.* *• Grazing land has significant potential for the creation of high quality and high value woodlands. However, this should be achieved in ways that seek to avoid adverse impacts on local patterns of agriculture. This proposal would therefore be considered large as the indicative threshold for planting land classed 1-4 is 10%. In Lanarkshire land graded LCA 4.2 and below which is improved grassland/arable type land is in high demand for intensive grazing, silage and forage crops from the livestock industry. RPID do not support this type of land to be taken out of agriculture, apart from*	demonstrated by our assessment, the total area of LCA 1-4 which would be affected is less than 10%. Scottish Forestry were contacted regarding this response and advised: *I have had a look at your assessment in relation to RPIDs response and I think it contains sufficient information in relation to the proportion of differing land types to allow us to make a decision on this. I therefore advise that we don't require you to respond to RPIDs comments.*

			some exceptions to this (e.g. small strips of land/shelter belts).	
Scottish Water	11/10/2023	07/11/2023	*Thank you for consulting with Scottish Water regarding the above activity.* *Drinking Water Protected Areas* *A review of our records indicates that there are no Scottish Water drinking water catchments or water abstraction sources, which are designated as Drinking Water Protected Areas under the Water Framework Directive, in the area that may be affected by the proposed activity.* *Scottish Water Assets* *A review of our records indicates that there are Scottish Water assets in the area. This should be confirmed however through obtaining plans from our Asset Plan Providers. Details of our Asset Plan Providers are included in the SW list of precautions for assets, which can be found on the activities within our catchments page of our website at www.scottishwater.co.uk/slm.* *All Scottish Water assets potentially affected by the activity should be identified, with particular consideration being given to access roads and pipe crossings. If necessary, local Scottish Water personnel may be able to visit the site to offer advice. All of Scottish Water's processes, standards and policies in relation to dealing with asset conflicts must be complied with.* *In the event that asset conflicts are identified then early contact should be made with the Highway*	We are aware there are Scottish Water assets in this area and have contacted the Highway Authorities and Utilities Committee as advised (contacted 13/11/2023, no response received at time of writing).

			Authorities and Utilities Committee (HAUC) at Hauc.diversions@scottishwater.co.uk. All detailed design proposals relating to the protection of Scottish Water's assets should be submitted to the HAUC for review and written acceptance. Works should not take place on site without prior written acceptance by Scottish Water. *Scottish Water have produced a list of precautions for a range of activities. The list of precautions for assets details protection measures to be taken if there are assets in the area. Please note that site specific risks and mitigation measures will require to be assessed and implemented. The document/s and other supporting information can be found on the activities within our catchments page of our website at www.scottishwater.co.uk/slm.* *It should be noted that the proposals will be required to comply with Sewers for Scotland and Water for Scotland 4th Editions 2018, including provision of appropriate clearance distances from Scottish Water assets.*	
James Morrison (Response to online form for and on behalf of Network Rail)	11/10/2023	09/11/2023	What is your connection to the area *Employed in area – other* What aspects of the Land Management Plan are you most interested in? *Other: Impacts to railway operations* What do you most like about the plan, and why? Very detailed and has considered impacts to NR assets. *It has a good mix of productive woodland for timber and native planting for biodiversity.*	Thank you for your comments.

			Is there a part of the plan that you would like to see improved, if so how? *No* Do you have any specific concerns about these proposals (e.g. impacts on a private water supply)? *No* Please add any further comments relating to the plan here. *N/A*	
Taylor group	11/10/2023		Thank you for notifying us about the consultation regarding Scottish Forestry and Lands proposals for Hartwood Farm. We have taken time to review the documents that are available online and would advise that we broadly support the aims and proposals that have been made. We do have some comments that we think could justify some additional consideration. The proposals for the Wind turbine show one of the turbines overlapping with land that we own. We have written to Forestry and Land regarding this under separate cover but would record here that we would not want any overlap of Forestry and Land Operations over our land. We have made an offer under separate cover to buy an area of land around this to enable this to happen. We think that some of the planting proposed around the former nursing home is too close to our boundary and it should be remembered that the building originally sat within a designed landscape. Forestry and Land now propose to plant on this land and change the setting within which the building	Thank you for your response to our Hartwood Forests Land Management Plan Consultation. Forestry and Land Scotland is the Scottish Government agency responsible for managing Scotland's national forests and land. We are pleased the Taylor Group broadly support the aims and proposals contained within this plan. However, you also raised a number of concerns regarding this Land Management Plan proposal in your letter dated 13th November 2023 and I have therefore responded to each of these comments in turn, below. <u>Concern about wind turbine overlapping with land under Taylor Group ownership</u> The windfarm development does not form a part of the Land Management Plan proposals and is shown for context only. The windfarm footprint as shown in the Land Management Plan is indicative and based on the layout which has been granted planning approval (14/01699/FUL). The windfarm developer is currently conducting ground investigation works which will inform the final location of the turbine bases, but for clarity none of the proposed turbines are located outwith the Forestry and Land Scotland landholding. If you have additional concerns or require further details

			has sat for nearly 100 years. The building is protected with listed status, and we would anticipate that Forestry and Land would respect what another Scottish government agency has deemed special and worthy of listed status and then not act in a manner which would detract from the building's original style and character. We believe that the planting should be moved further away from the existing building and that it should be further away from the boundary. We have made an offer under separate cover to buy an area of land around this building to enable this to happen. Planting trees so close to the existing building will enable those who participate in anti-social behaviour to do so more easily. This is something that we have worked hard to try to eradicate and is why we have thinned out the tree planting around the Nurses Home as it makes those who are misbehaving more visible and leaves fewer places for them to hide. There is a very real risk that the new planting in this area will result in an increase in antisocial behaviour. The building has been the target of sustained attacks and should these increase further due to the increased planting, there is a risk that the building could be damaged to the extent that it could not be saved and would need to be demolished. We have spent hundreds of thousands of pounds securing the buildings and changing the site so that there are fewer and fewer places for people to engage in anti-social behaviour. This has included fitting steel plates, forming barriers and cutting back vegetation. It would be a disaster for all of this work to be undone by the new and additional planting	regarding the windfarm we would suggest you contact the developers directly. <u>Concern about planting affecting the historic context of the former Nurses' Home</u> While this property is a listed building, the site is not included on the Inventory of Gardens and designed landscapes maintained by Historic Environment Scotland. Historic Environment Scotland have been consulted on our Land Management Plan proposals and have raised no concerns regarding these. We have, however, sought to design the planting of this area in a way which will complement the local landscape and the likely future use of the Nurses' Home site, although we have not yet seen any plans put forward regarding this. We would be happy to discuss the planting design for this area with the Taylor Group in regards to the potential for future public recreation, but in summary we do not believe the proposed planting is too close to the former Nurses' Home on the grounds of landscaping. <u>Concern about proposed planting causing an increase in anti-social behaviour</u> The proposed planting is not due to commence until winter 2026/27 and it will take between 5-10 years thereafter for the trees/shrubs to become established (i.e. close canopy). Given this, and the context of the Nurses' Home already being surrounded by mature trees/woodland on three sides, we do not feel the planting is likely to increase the risk of anti-social behaviour to this site. While we are happy to work with neighbours and local communities to address and discourage anti-social behaviour, ultimately the

			On another level, the land in front of the nursing home has historically been one of the best fields within Hartwood Farm and it has been used for grazing for both Cattle and sheep. The field has always been in better condition than other neighbouring fields with better quality grass and far fewer rushes. It is certainly of a much higher agricultural value than neighbouring fields whose grass is not as green, and which have more invasive rushes. We feel that it is wrong to ruin this land and downgrade its agricultural grade and quality. Moving on from the land in front of the nurses' home, we note that the proposals also include for planting near the access to the railway. Throughout our ownership of the former Hospital site, we have had numerous requests from network rail to accommodate requests for the use of additional land. We think that it would be prudent to hold back the planting from this area. We also note that the road going through the farm heading towards the reservoirs and wind turbines has been highlighted as being used as a forest road. We would remind Forestry and Land that when we bought the former Hospital site we also bought the right to upgrade this road to an adoptable standard. Forestry and Land Scotland should take note of this and recognise that there will be a road with full public access to the east and north of the former hospital. Again we have written to Forestry and Land under separate cover offering a solution which would prevent this from happening	security of this property is the responsibility of the Taylor Group. <u>Concern about the conversion of agricultural land</u> As the proposals within this Land Management Plan exceed certain thresholds, they will be subject to an Environmental Impact Assessment screening by the industry regulators, Scottish Forestry. Our own agricultural impact assessment, which was produced as part of the Land Management Plan and is available as part of the consultation, shows there will be limited impact on agriculture at a local level. The information available to us does not suggest this field is significantly better than similar parts of the farm, therefore, from an agricultural perspective, we do not believe there is a special case for removing this area from the planting proposals. <u>Concern about planting close to the railway</u> Network Rail have been consulted on our proposals and stated that they believe these are sufficiently detailed and have given adequate consideration to Network Rail assets. Therefore, we do not believe further alterations to the design are required from that perspective. <u>Access road through the farm</u> We are aware of the existing rights on this access route and foresee no conflicts with the Taylor Group’s legal rights on, or use of, this route. I hope these comments are helpful in answering the points raised in your letter of 13th November. I understand you have written to us separately expressing interest in potential land transactions

			As we mentioned previously, we broadly support the proposals but would seek your comment on the points that we have raised.	relating to some of these concerns and we will be contacting you regarding these requests in due course.
North Lanarkshire Council: • Access Officer • Senior Biodiversity Officer • Roads Officer • Planning Department • Biodiversity and Renger Team	11/10/2023	N/A	No responses received.	
Hartwood Community Development Trust	11/10/2023	07/11/2023	Attended consultation event. Supportive of proposals but please consider parking for visitors to the site in years to come as the community have already had some issues with parking for visitors walking at the former Hartwood Hospital. (FLS Planning and VS Staff also met with representatives from the HCDT prior to the during the LMP development to discuss plans for the proposed amenity woodland area immediately adjacent to Hartwood Village and all feedback was positive.)	We are grateful for the time and interest given by the members from the Hartwood Community Development Trust to these proposals. Regarding parking concerns, we have no plans to advertise this site as a destination on the FLS website and any change to this will be discussed with the local community beforehand.
Ayrshire and South Lanarkshire Timber Transport Project Officer	11/10/2023	N/A	No response received.	
Shotts Getting Better Together	11/10/2023	N/A	No response received.	
Green Action Trust	11/10/2023	N/A	No response received.	
Councillor Martin McCulloch	11/10/2023	07/11/2023	Attended consultation event and supportive of proposals.	As above, we are grateful for the Councillors attendance and feedback on the proposals.

Councillor Clare Quigley	11/10/2023	N/A	No response received.	
Councillor Kenny Stevenson	11/10/2023	N/A	No response received.	
Councillor Margret Hughes	N/A	07/11/2023	Attended consultation event and supportive of proposals.	As above, we are grateful for the Councillors attendance and feedback on the proposals. As requested, Councillor Hughes has now been added to the consultee list for this area.
Hartwood and Allanton Community Council	11/10/2023	N/A	No response received.	
Salsburgh Community Council	11/10/2023	N/A	No response received.	
Neil Gray MSP	11/10/2023	N/A	No response received.	
Local Schools and Nurseries	11/10/2023	N/A	No response received.	
Central Scotland Raptor Study Group	11/10/2023	N/A	No response received.	
Scottish Badgers	11/10/2023	N/A	No response received.	
Protium (Windfarm Developer) Greencat Renewables (Development Contractors)	11/10/2023	N/A	Protium and Greencat Renewables did not provide any formal response to the LMP planting proposals.	(FLS and Protium are in ongoing dialogue regarding the proposal to establish new woodland in the vicinity of the proposed wind turbines, however as several details of the scheme have not yet been confirmed by Protium (e.g. model of turbine and size of keyhole required), it is not possible to reach a fixed agreement at this time.)
RSPB (Glasgow)	11/10/2023	N/A	No response received.	
SEPA	11/10/2023	N/A	No response received.	
COSMOS-UK (Operators of existing site monitoring station)	11/10/2023	N/A	No response received.	
Edinburgh University	11/10/2023	N/A	No response received.	

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Appendix III – LMP monitoring and review

III/1. Review of previous management plan

Table 17, below, provides a detailed review of the previous management plan for Murdostoun and Mossband and progress against the plan objectives.

Table 17 Review of previous LMP

Brief	Objectives	Progress to date 1 – Little or no progress 2 – Some progress 3 – Progress as per plan
Climate change, Increase Biodiversity Value	Begin process of LRB restoration	2 – restoration has begun on Mossband although this requires some remediation work. Restoration of Murdostoun has been delayed. Restoration objective remains relevant for next LMP.
Incorporate productive tree species where feasible	Implement timber production where site conditions and access are suitable, subject to LRB requirements.	1 – no felling or restocking within lifetime of the plan has met this objective. This objective is no longer considered relevant in the contect of Murdostoun and Mossband but will be pursued on the wider Hartwood Forests LMP area, through new woodland creation.
Community Development	Work with partners to increase local involvement	2 – Visitor Services staff involved with communities and interest groups at a local level. Highly relevant for next plan.
Optimise access to improve recreational opportunities locally.	Maintain clean access points	3 – while fly-tipping remains an issue, any dumping is removed as appropriate.
	Develop option for circular route round the perimeter of Mossband.	1 – not pursued during life of the previous plan. Subsumed into wider amenity and recreation objectives for current plan.

	Strengthen links with CSFT's Nature Park adjacent to Mossband	2 – ongoing engagement with CSFT (now Green Action Trust). Highly relevant for next plan.
Preserve landscape and historic features	Protect the existing hedgerows.	3 – features retained. objective subsumed into next plan as part of standard UKFS and UKWAS compliance.
	Protect known historic features	3 – features retained and mapped on FLS GIS database. Objective subsumed into next plan as part of standard UKFS and UKWAS compliance.
Increase biodiversity value	Remove self-seeding conifer (SS & LP) from LEPO areas.	1 – no work carried out to remove conifer from LEPO areas to date. Removal is identified within the next LMP period.
	Expand and link areas of native woodland	1 – no opportunities to expand native woodland during plan period. Objective remains highly relevant and should be achieved during next LMP period.

III/2. LMP Objective Appraisal, Monitoring & Evaluation

Table 18, below, details how the objectives of this LMP will be monitored and reviewed. See also main text – section 1.3.

Table 18 LMP Objective Appraisal, Monitoring & Evaluation

LMP Objective	Assessable criteria	Appraisal method	Monitor method	Monitor where	Monitor when	Monitor who	Record monitoring where	**Evaluation.** How does the Appraisal and Monitoring method inform current & future proposals?
Establish stands capable of producing timber for a range of markets, including quality hardwood and softwood sawlogs.	Woodland creation and restocking area/quality	Area established, stocking density, vigour and stem form	Year 1 and Year 5 SDA surveys; LMP 5 year review and 10 year renewal	On site	Years 1 and 5 after planting; 5 year LMP review and 10 year LMP renewal	Woodland Creation and Forest Management Foresters; Forest Planner	Year 1 and 5 SDA assessments; mid-term (5 year) review template and 10 year appraisal.	Area established gives an overall quantity for productive woodland establishment; stocking density, vigour and stem form required to confirm areas are suitable for future timber production.
Improve biodiversity value through new <u>woodland creation</u>	Woodland creation and	Area established against LMP	Year 1 and Year 5 SDA surveys; LMP	On site	Years 1 and 5 after planting; 5 year LMP	Woodland Creation and Forest	Year 1 and 5 SDA assessments; mid-term (5	Area established against LMP gives an overall quantity for native woodland habitat

LMP Objective	Assessable criteria	Appraisal method	Monitor method	Monitor where	Monitor when	Monitor who	Record monitoring where	**Evaluation.** How does the Appraisal and Monitoring method inform current & future proposals?
and peatland restoration, expanding and connecting with existing habitats.	restocking area/quality	proposal, stocking density and vigour	5 year review and 10 year renewal		review and 10 year LMP renewal	Management Foresters; Forest Planner	year) review template and 10 year appraisal.	establishment and location relevant to planned habitat networks; stocking density and vigour are required to confirm woodland establishment is or will be successful.
Improve biodiversity value through new woodland creation and <u>peatland restoration</u>, expanding and connecting with existing habitats.	Peatland restoration area/quality Native woodland creation area/quality (e.g. tree species diversity)	Area restored against LMP proposals, wetness of site, absence of regeneration and presence of indicator bog vegetation	Year 1 and year 5 SDA surveys; peatland monitoring surveys; LMP 5 year review and 10 year renewal	On site and desk-based (SCDB check)	Year 1 and year 5 SDA surveys; peatland monitoring surveys; 5 year LMP review and 10 year LMP renewal	Peatland Restoration Forester Planning Forester	5 year LMP review and 10 year LMP renewal	Area restored against LMP gives an overall quantity for bog restoration and location relevant to planned habitat networks; wetness, absence of tree regeneration and presence of bog vegetation indicate the relative success of restoration. SCDB information and site observation will indicate extent and quality of native woodland planting.
Improve social and recreational value by facilitating informal access, providing amenity and pursuing suitable opportunities for community involvement.	Use of site for informal recreation and engagement events (e.g. Branching Out)	Number of visitors and feedback from site users; presence and quality of access routes	Local FLS Community Ranger and Visitor Services Manager	On site and in local communities	Ad-hoc basis throughout life of plan; 5 year LMP review and 10 year LMP renewal	Local FLS Community Ranger and Visitor Services Manager	5 year LMP review and 10 year LMP renewal	Number of visitors, visitor feedback and presence and quality of access routes all help to indicate the levels of usage and quality of visitor experience.
Identify and establish areas for long-term agricultural use and agroforestry trials; primarily utilizing	Grazing lease agreement in place and appropriate use of site by tenant	Lease documentation, stocking and/or sheep trespass records and agroforestry	Records check	Desk-based and on site if necessary	5 year LMP review and 10 year LMP renewal	National Agricultural Advisor; Area Land Agent; Assistant Operations	5 year LMP review and 10 year LMP renewal	A lease agreement indicates use of site for agricultural purposes; stocking and/or sheep trespass records indicate appropriate use of site and any conflicts with

LMP Objective	Assessable criteria	Appraisal method	Monitor method	Monitor where	Monitor when	Monitor who	Record monitoring where	**Evaluation.** How does the Appraisal and Monitoring method inform current & future proposals?
areas constrained for woodland creation.		plans or proposals				Manager; Forest Planner		woodland creation. Agroforestry plans or proposals will indicate if trials are planned or underway.
Fulfil opportunities and commitments for on-site renewable energy production where appropriate (i.e. pre-existing windfarm proposal).	Presence of windfarm lease and revenue generation	Lease documentation, progress against lease/approved planning application	Records check with relevant teams: LMP 5 year review; option or lease review.	Desk-based	5 year LMP review and 10 year LMP renewal; windfarm option and lease revisions.	Forest Liaison Officer (FLO); Area Land Agent (ALA); Planning Forester (PF)	5 year LMP review	Reviewing the lease and/or option documentation and progress/revenue made against the lease will indicate the overall success of the windfarm proposal and associated energy turnover.

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Appendix IV – Hartwood Forests LMP Deer Management Plan

Background

- This Deer Management Plan (DMP) should be used as a supporting document/annex for the Land Management Plan (LMP). The DMP should also relate/be used in conjunction with the FLS Deer Management Strategy.

National & Local objectives

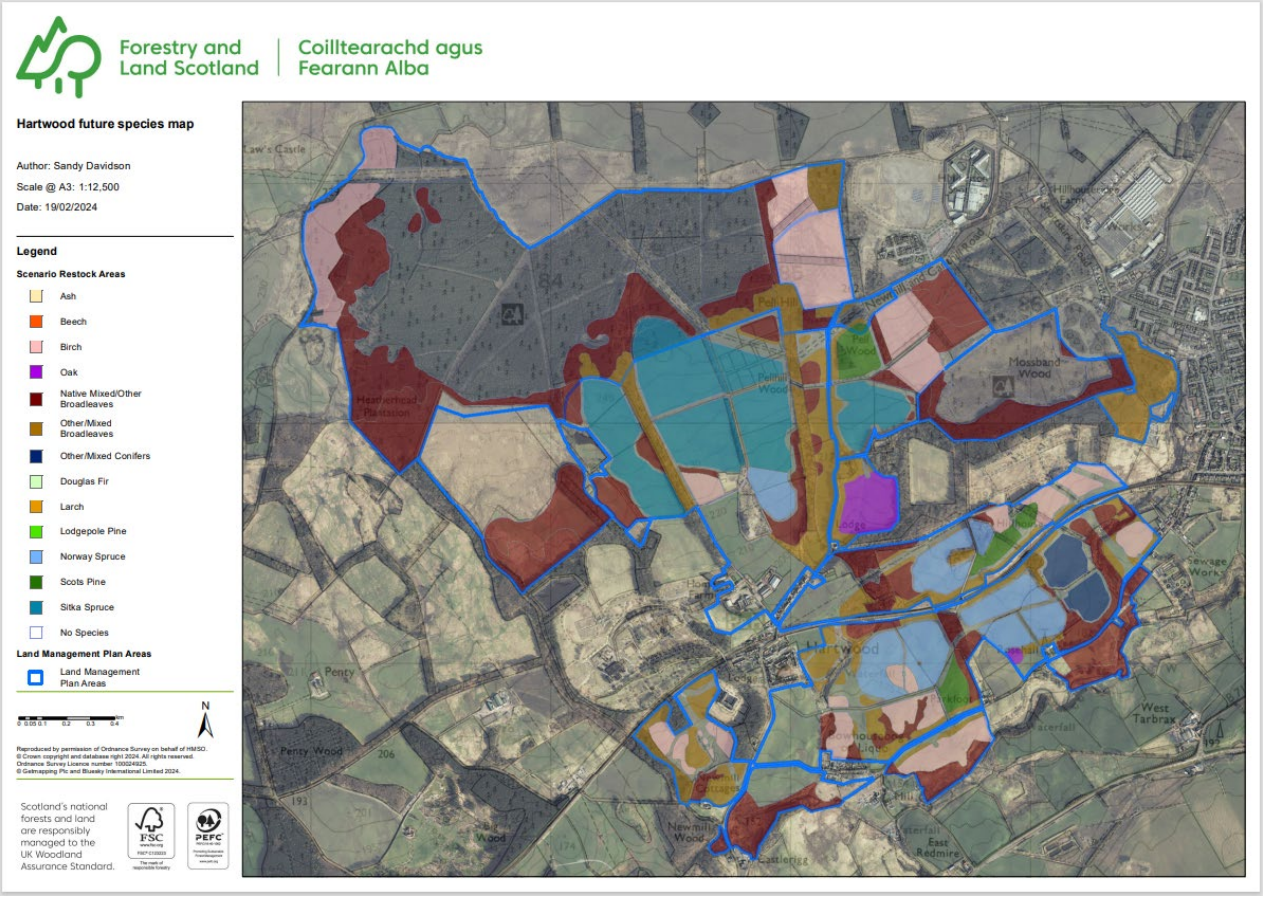
- Local and National objectives should be linked in here.
- National
  - Contributing to Scottish Forestry - Forestry Strategy (also includes Climate Change)
  - Deer Management Strategy Deer management strategy - Forestry and Land Scotland
  - Scottish Biodiversity Strategy Biodiversity strategy: consultation - gov.scot (www.gov.scot)
- Local

Central Region Deer Management Plan (internal only link)

Central Region DMP 2022 .docx

What are we going to protect?

Currently the block consists of open pasture which is currently still being farmed with livestock. At the North Westerly corner of the site mature Sitka spruce are found planted on top of deep peat. This area is marked for **peatland restoration** after the Sitka spruce have been removed. This is largely a newly acquisitioned block for FLS and as such the future plans are vastly different from its current state. Future plans for the block indicate large areas to be planted with **productive broadleaves, soft conifers and productive oak**. Currently deer densities are estimated at 10 deer/km^2 and with future plans in mind the **deer densities in the wider area will need to drop to below 3 deer/km^2**. Once the livestock is removed from the land an influx of deer is expected and this will influence the population model for this block.



Deer Species (and other herbivores/feral pigs)

- Roe deer is found within this block.
- Due to the lack of planting brown hares have not been reported as an issue, however this will be monitored post-planting and managed as appropriate.

What have we done to date?

- Much of this block was purchased by FLS in 2021 so we have only had it for two seasons.
- **27 deer were shot in season one and 26 in season two.**
- This current season (**season three**) has seen **16 male deer shot in the summer.**
- There are no impact data for this site due to it being open pasture and no trees been planted yet.
- Direct deer culling is the only protection method currently employed and we do not foresee significant areas of fencing or other protection methods being required.

Geography

- The geography is open pasture land with some mature Sitka spruce planted on peatland in the North West.
- The geography does not cause any issues for deer management such as a lack of backstops or high cover.

Have an evidence based approach

FLS use an information based decision making process to set its deer management operations with the data received from varies internal and external reports and include;

- Thermal drone counts
- Herbivore dung counts
- Historical cull data
- Near neighbour cull and sighting data
- Ranger daily/monthly reports
- Deer Management Contractor daily/monthly reports
- Helicopter counts
- WRM surveys
- Survey data are independently obtained – i.e. Deer density figure, impacts - NN/HIA, SDA, etc.
- All data obtained are then combined as best possible and applied to a population model which is used to set culls.
- Due to this block being a new acquisition and no planting having been done on it we do not have any of the above data. We have thus used local knowledge, contract ranger reports and professional judgement to populate our population model.
- **This block will be monitored post-planting for the first three years using our in-house thermal drone pilot and drone.**

Link to Deer Dashboard

- Most of data is used to create this DMP can be found in the Deer Dashboard, please see a link below. Currently only available to FLS staff, however to be made public soon.
- https://fls.maps.arcgis.com/apps/MapSeries/index.html?appid=19d7887f055f469e9e472b5fec0d0630

Population Modeling and Future Culls

Cull set for **2023-24 season at 40** and will be delivered by a Wildlife Management Contractor. **Deer densities to drop below 3 deer/km² by 2027.**

The below population model will be adjusted as we see a change in the population post-livestock removal and we see how immigration changes.

Clean Master sheet

Baseline Roe Deer Population Model

Yr 1 EUD km2 @ 1st	10
Start Yr Population	52.2
Area (ha)	522

Sex Ratio	Female	Male	
	50%	50%	100%

Financial Year (FY)	Population at 1st April (Start FY)	Population at 1st April (Start FY)	Total Population	No per 100ha 1st April	Kid % of pop at 1st April	Recruitment Female	Recruitment Male	Total Recruitment	Est Annual Mortality/Immigration %	Female Immigration/ mortality	Est Annual Mortality/Immigration %	Male Immigration/ mortality	Female pop 31st Aug	Male pop 31st Aug	Population 31st Aug	No per 100ha 31st Aug	Set % Cull	Female Cull	Male Cull	Total Cull	% Cull Achieved	Female Pop at 31st March (End FY)	Male Pop at 31st March (End FY)	Total Pop 31st March
Yr 1	26	26	52	10.0	80	10	10	21	30	8	30	8	44	44	89	17.0	45.0	20	20	40	45.0	24	24	49
Yr 2	24	24	49	9.4	80	10	10	20	30	7	30	7	41	41	83	15.9	50.0	21	21	41	50.0	21	21	41
Yr 3	21	21	41	7.9	80	8	8	17	30	6	30	6	35	35	71	13.5	55.0	19	19	39	55.0	16	16	32
Yr 4	16	16	32	6.1	80	6	6	13	30	5	30	5	27	27	54	10.3	60.0	16	16	32	60.0	11	11	22
Yr 5	11	11	22	4.1	80	4	4	9	30	3	30	3	18	18	37	7.0	65.0	12	12	24	65.0	6	6	13
Yr 6	6	6	13	2.5	80	3	3	5	30	2	30	2	11	11	22	4.2	45.0	5	5	10	45.0	6	6	12
Yr 7	6	6	12	2.3	80	2	2	5	30	2	30	2	10	10	20	3.9	45.0	5	5	9	45.0	6	6	11
Yr 8	6	6	11	2.2	80	2	2	4	30	2	30	2	10	10	19	3.7	45.0	4	4	9	45.0	5	5	10
Yr 9	5	5	10	2.0	80	2	2	4	30	2	30	2	9	9	18	3.4	45.0	4	4	8	45.0	5	5	10
Yr 10	5	5	10	1.9	80	2	2	4	30	1	30	1	8	8	17	3.2	45.0	4	4	8	45.0	5	5	9

Protection Options – cull/fence/tubes

- Direct deer culling is the only protection method currently employed and we do not foresee any significant requirement for fences or other physical protection.
- The exception to this will be areas planted with productive oak and native oak which will be protected with either 1.2m tree shelters or deer fencing as appropriate. Productive wild cherry will also be protected using 1.2m tree shelters.
- Local wildlife management resources are available to carry out control within this block for the next 4 years. The wildlife management contractor for this area has indicated they can protect productive broadleaves and soft conifers without the need for physical protection.

How will objectives be met? Staff, contractor?

- The DMP area will be/is currently being managed by a Wildlife Management Contractor.
- Wildlife Management Contractors are qualified to Deer Stalking Certificate levels 1 & 2. In addition the they are required to carry out an annual firearms skills test, ensuring the highest levels of safety and competency when undertaking their duties. Wildlife Management Contractors are supported by a Wildlife Ranger Manager and Area Wildlife Ranger Manager.
- Contractors are selected after satisfying FLS of their competence via a competitive tender. This work is arduous and critical to the success of the impact reduction strategy and only very experienced and appropriately qualified contractors are considered. All Wildlife Contractors have the same qualifications as FLS Wildlife Rangers and compliance and H&S are continually monitored by the Wildlife Ranger Manager.
- Out of season shooting is an essential tool in the protection of vulnerable tree crops and natural habitats. This is conducted either under the General License issued by NatureScot for enclosed woodland or by 5(6) authorisation on application to NatureScot for un-enclosed woodland. Male deer of all species will be shot year round on FLS land following permission, the shooting of females out of season will be limited to the periods 1st of September to 20th October and from the 16th February to the 31st March. When early out of season shooting of females is carried out any dependent young will be shot first.
- Night shooting is permitted by the Deer (Scotland) Act 1996 as amended by the Wildlife and Natural Environment Act 2011 (WANE Act), under section 18(2) authorisations granted by NatureScot. Applications for night shooting will only be made where unacceptable levels of damage would occur, and where the use of all other legal means of control, including out of season shooting have been considered. Operational dates for night shooting will be kept under review and can be changed should circumstances dictate. All operations will conform to current Best Practice Guidance and a copy of the guides will be held at the district office and issued to Wildlife Rangers as necessary. Night shooting is a valuable tool in areas of high deer management pressure where the population has become wise to deer management practices.

Infrastructure? Roads/ATV tracks/glades/larders/equipment

- The area contains an extensive network of roads and tracks making both culling and extraction easy.
- An existing deer larder is located at West Calder c.20 minutes away.
- The local Wildlife Management Contractor accesses and monitors the block on a daily basis.
- With the whole site being open pasture and all getting planted at the same time this will leave a block with wide open views over the trees and will make deer management a viable option over fencing.
- In addition, a network of rides, glades and headlands have been incorporated into the woodland design to assist with deer management as the new planting becomes established.

Collaborative working opportunities

- There are no Deer Management Groups in the area.
- The current Wildlife Management Contractor has open communication channels with neighbours which opens up the possibility for future cross boundary agreements and larder sharing to aid in landscape scale deer management.

Venison

- FLS subscribe to the Scottish Quality Wild Venison (SQWV) scheme. This sets the standards for our larders and actions of our staff and contractors to ensure we provide a safe food item to market.
- All venison is quality assured and sold to Highland Game where it is further processed.
- Scottish Lowlands has 1 deer larder with a capacity of 57 Roe deer.
- All waste from the larders are removed by a licensed waste disposal contractor.
- All animal by-products are sold to Highland Game along with the venison.
- Venison are also sold privately from the Aberfoyle larder under our Venison Dealer's license.

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Appendix V – Hartwood LMP Agricultural Impact Assessment

V/1. – Summary of existing land use

The majority of the Hartwood Home Farm site (circa 279ha, or 86%) is used for pastoral grazing of cattle and sheep, with some limited cropping potential on the lower fields. There are circa 47 hectares of existing woodland on the site, which is split more or less evenly between LCA codes 4.1 and 4.2. Circa 40ha of LCA code 4.2, situated at the North East and North West corners of the new acquisition is likely to function closer to LCA 5.2, while a further 9ha is likely to perform closer to LCA 5.1. (These figures have not been adjusted in the table below as this would skew comparisons with the local agricultural availability.) Table 19 and figure 3, below provide a detailed breakdown of the land capability on the site of the former Hartwood Home Farm (excluding the historic FLS landholdings of Murdostoun and Mossband).

Table 19 - land capability for agriculture (50k) at Hartwood Home Farm.

LCA Code[1]	**LCA Type**	**Area (ha)**	**% of site**
4.1	Non-prime arable land (suited to a narrow range of crops)	137.86	42
4.2	Non-prime arable land (primarily suited to grassland)	172.45	53
1-4	**Total 'Arable and mixed land use'**	**310.31**	**95**
5.2	Improved grassland (moderate quality)	0.30	<1
5.3	Improved grassland (poorer quality)	0.27	<1
5.1-5.3	**Total 'Improved grassland'**	**0.57**	**<1**
888	Urban areas	15.98	5
Total[3]	**All**	**326.86**	**100**

[1] Amalgamated classifications are based on thresholds taken from the *Woodland Creation on Agricultural Land – Scottish Forestry WEAG Information Sheet*

[2] Given areas do not account for existing woodland within these LCA types

[3] Total area for Hartwood Home Farm site, excluding areas of Murdostoun and Mossband which are included as part of the wider Land Management Plan area.

V/2. – Woodland creation impacts on agriculture

RPID comments

The Scottish Government Rural Payments and Inspections Directorate (RPID) were offered the opportunity to comment on the purchase of Hartwood Home Farm by Forestry and Land Scotland for the purposes of Woodland Creation in 2019. The following assessment was completed and submitted in response by Allan Young, Senior Agricultural Officer, Hamilton Office.

Local farming context:
The availability of an area of 211 Ha of pasture land with limited cropping potential, 40 ha of permanent pasture and 28 ha of rough grazing land may have some importance at individual farm business level and may raise interest among potential or actual lessors, purchasers, neighbours, grazing tenants or other interested parties.

District farming context:
The change of land use of 279 ha of agricultural land at Hartwood to woodland creation with its recent use as agricultural research into hill farming by the James Hutton Institute may raise interest among potential or actual lessors, purchasers, neighbours, grazing tenants or other interested parties.

Regional farming context:
The change in land use of 279 Hectares of agricultural land in North Lanarkshire from agriculture to forestry would not be significant in relation to current agriculture activity within this area.

Summary and recommendations:
Supportive of proposal of the change of use of agricultural land to woodland creation and its linkage to the East Tarbrax land purchase proposal for the creation of a "statement" Centenary Forest in Central Scotland.*

[*N.B at the time of these comments, FLS was also investigating the potential purchase of the adjoining East Tabrax Farm, which was not progressed.]

Assessment of land-use change

In order to further support and evidence the comments above, Scottish Forestry have requested an objective assessment of how the proposed land-use change will impact the availability of agricultural land within the immediate local area (advised as a 5km radius from the site). Table 20 and figure 4, below provide a summary of the areas of different agricultural capability within the local area, and the percentage of this within the site.

Table 20 - local land capability analysis (land capability for agriculture 50k)

LCA Code[1]	Area within 5km radius[2]	Area within site	% area within site	Indicative threshold[3]
3.1	41.71	0	0%	N/A
3.2	421.96	0	0%	N/A
4.1	1160.58	137.86	12%	N/A
4.2	2925.09	172.45	6%	N/A
1-4	**4549.34**	**310.31**	**7%**	**>10% of LCA Type**
5.1	45.39	0	0%	N/A
5.2	546.83	0.30	<1%	N/A
5.3	1495.33	0.27	<1%	N/A
5.1-5.3	**2087.55**	**0.57**	**<1%**	**50 hectares**
888	1210.72	15.98	1%	N/A
999	6.38	0	0%	N/A
Grand Total	**7853.98**	**326.86**	**4%**	**N/A**

[1] Amalgamated classifications based on the thresholds taken from Woodland Creation on Agricultural Land – Scottish Forestry WEAG Information Sheet

[2] 5km radius as measured from the approximate centre of the Hartwood Home Farm site, this overestimates the area of each LCA within the site when compared to a 5km radius measured from the boundary

[3] Indicative thresholds taken from Woodland Creation on Agricultural Land – Scottish Forestry WEAG Information Sheet

Conclusion

The above assessment, together with the comments provided by RPID, demonstrate that woodland creation on the former site of Hartwood Home Farm will have limited impact on the availability of agricultural land within the local area. No woodland creation is proposed on prime agricultural land (defined as LCA codes 1, 2 and 3.1) with the majority of the site comprising pastoral land with limited cropping potential, which are the most commonly occurring LCA types within the local area.

Figure 3 - Land capability for Agriculture (50k) on Hartwood Home Farm

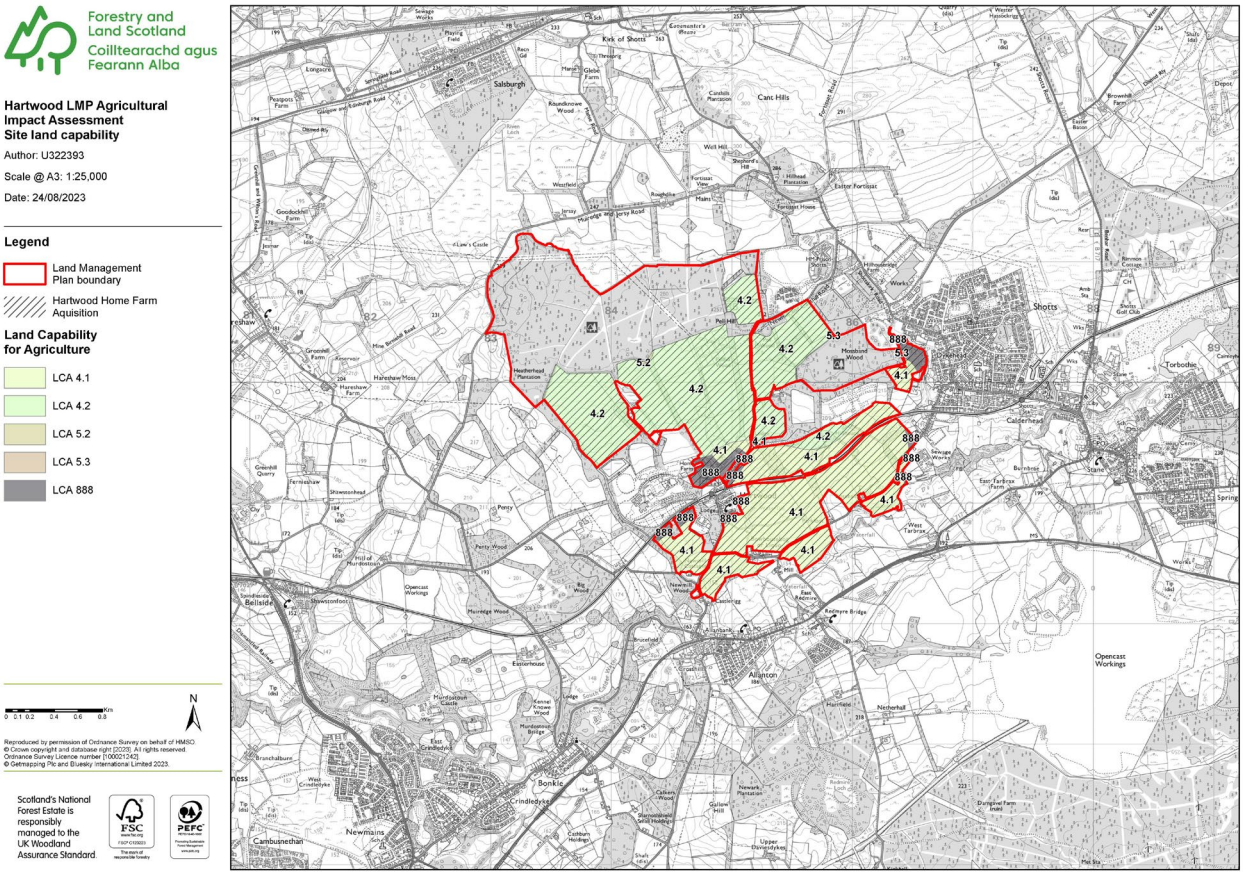
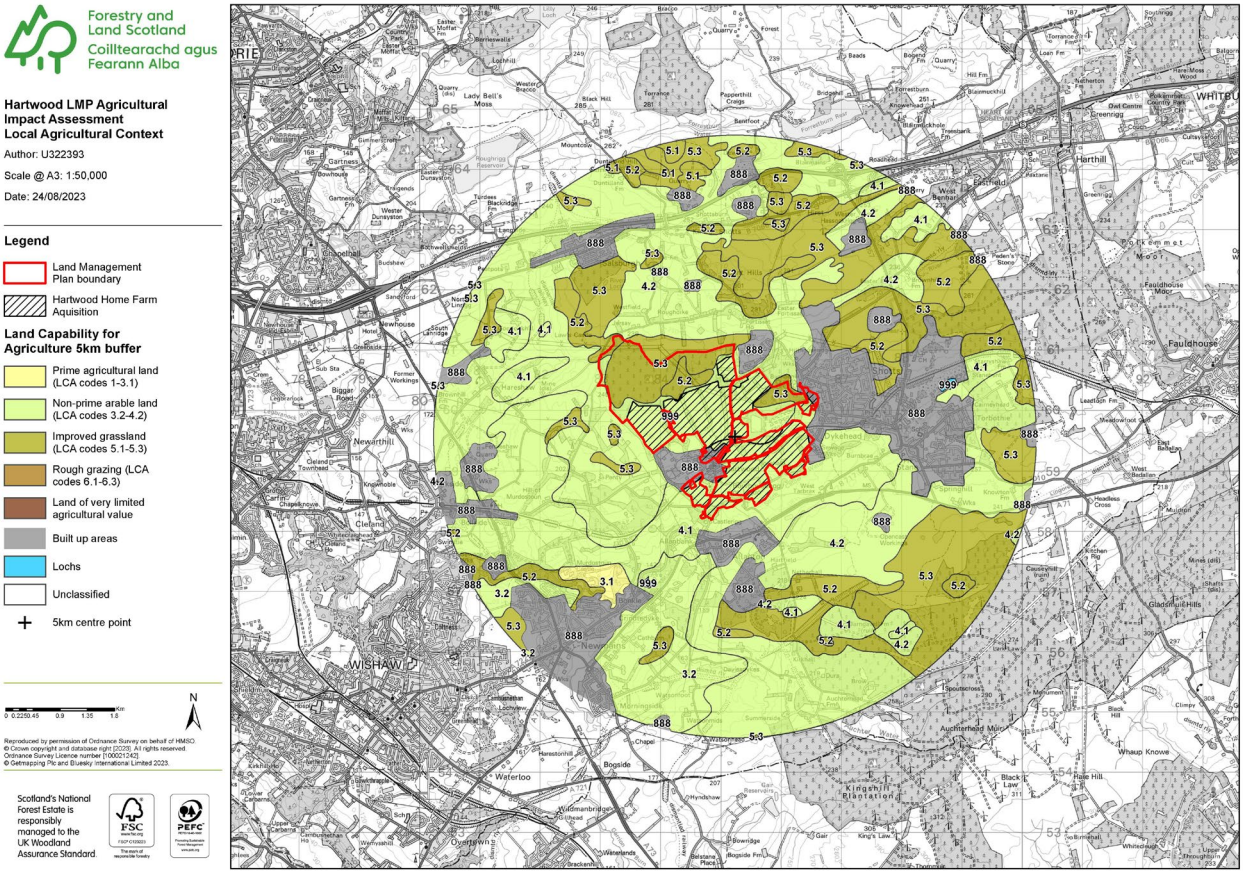


Figure 4 - Land capability for Agriculture (50k) within local area (5km radius from Hartwood Home Farm)



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Appendix VI – Hartwood Forests LMP Agricultural Management Plan

Introduction and scope

The purpose of this document is to set out the broad principles and design criteria for areas of residual agricultural land located within the Hartwood Forests Land Management Plan (LMP). It is intended to guide future decisions about the design and management of these areas, rather than prescribe set design or management prescriptions. It is hoped these areas (hereafter 'the agricultural unit') will contain areas of conventional agriculture and mixed land use (agroforestry), with these being leased to a suitable tenant who may engage in the detailed design of any planting. The type of agricultural use will likely be restricted to the grazing of livestock such as sheep or cattle.

Area of agriculture

The Hartwood Forests LMP extends to 522.18ha, within which circa 22ha has been identified for ongoing agricultural use (see figure 5). The focus of this document is on the 22ha agricultural unit, although suitable agricultural use (livestock grazing) may be extended to other areas of open land, if desired, at a later date. In all cases, the core agricultural unit must be maintained at or above 20ha in size in order to ensure this remains viable as a grazing lease.

Objectives

The retained agricultural unit is intended to achieve a range of objectives as outlined below:

1. To maintain the open character and views in and around Hartwood Village.
2. To increase knowledge and awareness of agroforestry in a Scottish context and act as a potential trial and demonstration site.

…and through the use of agroforestry, to:

a) To improve stock health and agricultural returns.
b) To improve the environmental value of the agricultural unit and the LMP area as a whole.
c) To produce suitable timber or other non-wood products for income diversification.

Design recommendations

Design of the agricultural unit

The agricultural unit has been designed largely based on existing field boundaries, in a way which seeks to minimise potential conflicts with adjoining woodland creation and other land uses, and maximises the practicalities of management such as stock movement and access to water. The unit comprises four fields of varying size which are split roughly into two areas. It is intended that stock movements can be facilitated between the two fields in each of these respective areas without the use of a stock trailer (see figure 5).

Design of agroforestry areas

The following section details some potential design and management considerations for any areas of agroforestry established within the agricultural unit.

Type of agroforestry

It is intended that areas of agroforestry are established and managed as a silvopastoral system, grazed by cattle or sheep, with individual trees at wide spacing and/or small copses of trees at narrower spacing. In order to qualify as agroforestry and not woodland creation, these areas should:

- Be established at a density of 400 stems per hectare or less
  OR
- Comprise trees at a higher density in individual areas less than 0.25ha in area
  AND
- Be retained in agricultural use for a period of at least 20 years

(These criteria are based on the specifications of the agroforestry options in the Forestry Grant Scheme, which do not require EIA screening for woodland creation, and minimum mappable areas of 0.25ha as defined by Scottish Forestry.)

Species choice

Tree species should be selected based on the specific objective(s) of the area in question (e.g. stock health, biodiversity, and/or timber production). The Ecological Site Classification Decision Support Software (ESC DSS) from Forest Research and detailed soil maps within Forester Web should be used to help select species which are suitable for the area in question. Primarily native broadleaved species should be used in order complement the local landscape character and wider woodland design. Examples of potential species and their benefits are given below:

- Oak – timber, biodiversity, stock health
- Aspen – timber, biodiversity, soil and stock health
- Birch – timber, biodiversity, soil and stock health

- Alder – soil and stock health, biodiversity, timber
- Willow – stock health, biodiversity, timber (some species – check suitability)

Planting design and management

As outlined above, agroforestry areas should be established as either individual trees at wide spacing (≤400 stems/ha), or tree nests/copses at narrow spacing (≥1600 stems/ha within an area of ≤0.25ha). Both these designs have advantages and disadvantages and are likely to require different approaches to establishment and management. For individual trees at wide spacing, where timber production is an objective, formative pruning may be required from an early age and this is more likely to be suitable for species such as aspen or birch. For tree nests/copses, where timber production is an objective, establishment at high stocking densities (up to 10,000st/ha) with subsequent thinning is likely to be the best way of achieving good timber quality. There may also be a case for a hybrid approach to be adopted where copses are planted at a lower density (e.g. 2500 stems/ha) and formative pruning employed alongside later thinning to achieve good timber quality.

Tree protection

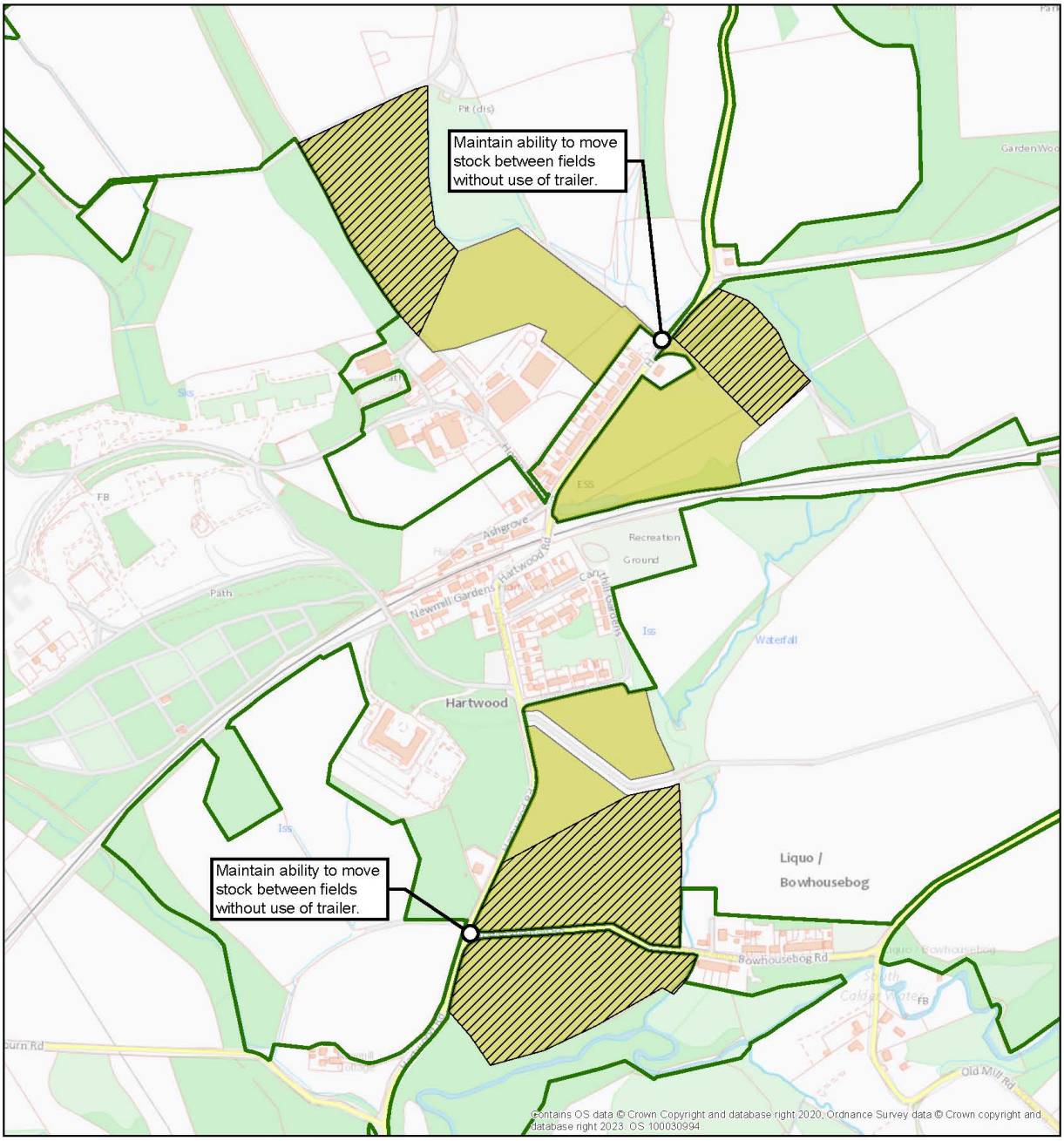
Requirements for tree protection will depend on whether they are established individually at wide spacing or within nests/copses. Establishment at wider spacing will require individual tree protection (e.g. cactus guards), while copses/nests could be protected more conventionally with the use of stock fencing. It is recommended that any protection is designed and constructed to a standard that will protect the trees against both sheep and cattle, and also considers the potential browsing threat from other animals, namely roe deer, rabbit or hare, and field voles. Particularly where trees are established individually at low densities, the potential impact of trampling and compaction within the root zone should be considered. This is more likely to be problematic for lower densities due to the increased potential for concentration of stock around individual trees.

Further Resources:

Additional resources on the design and management of agroforestry systems should be consulted as required. Some information is available from the following websites:

Woodland Trust: https://www.woodlandtrust.org.uk/plant-trees/agroforestry-benefits/
Soil Association Agroforestry Handbook: https://www.soilassociation.org/media/19141/the-agroforestry-handbook.pdf
Forestry Grant Scheme website: https://www.ruralpayments.org/publicsite/futures/topics/all-schemes/forestry-grant-scheme/
Macaulay Land Use Research Institute web archive: https://macaulay.webarchive.hutton.ac.uk/agfor_toolbox/trees.html

Figure 5 – this gives an indication of the location of proposed agricultural retentions, potential agroforestry and key access for stock movement between fields.



Legend

Agricultural management

Scale @ A3: 1:5,000

Date: 26/09/2023

Author: Sandy Davidson

Indicative agroforestry areas

Indicative agricultural areas

LMP boundary

Scotland's national forests and land are responsibly managed to the UK Woodland Assurance Standard.

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Appendix VII – Hartwood Forests Land Management Plan Visualisations

This document contains a series of ‘visualisations’ from different viewpoints around the Hartwood Forests Land Management Plan (LMP) area, which give a representation of how our proposed management activities will look within the landscape. These visuals are representative only but should give a reasonable indication of where woodland will be located in the future, and how this might look when viewed at particular locations. The viewpoint locations are depicted on the map on page 2, below, with arrows indicating the approximate direction of view.

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Viewpoint locations

Author: U322393

Scale @ A2: 1:15,000

Date: 26/09/2023

Legend

- LMP boundary
- VP locations
- × Turbines*

*Turbine locations shown for spatial reference only and do not form part of the LMP proposals.

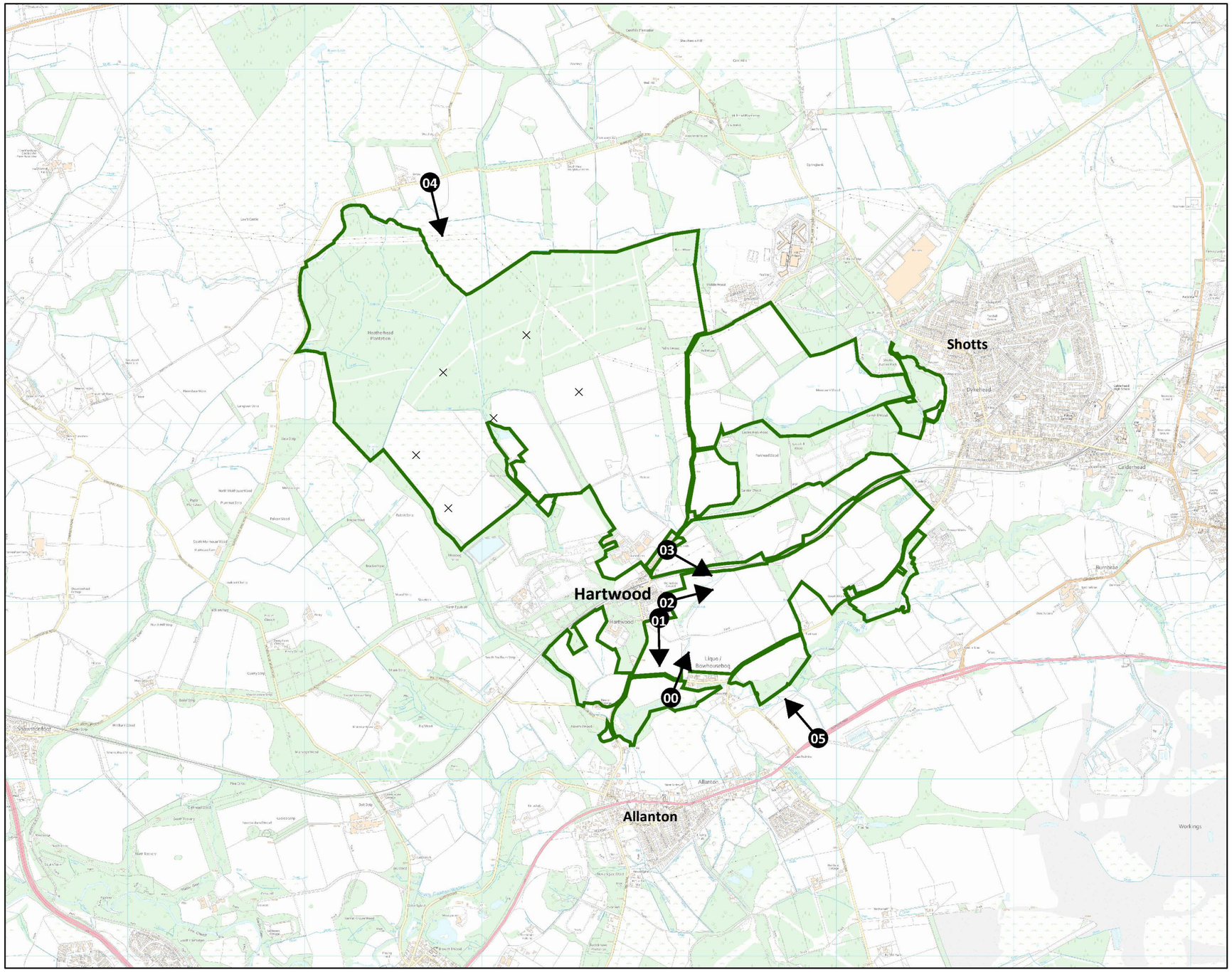
0 0.125 0.25 0.5 0.75 1 Km

N

Scotland's National Forest Estate is responsibly managed to the UK Woodland Assurance Standard.

FSC www.fsc.org FSC® C123223 The mark of responsible forestry

PEFC PEFC/16-40-1002 Promoting Sustainable Forest Management www.pefc.org



VP 00 – These visuals depict a ‘birds eye’ representation of the new woodland proposed around Hartwood and Bowhousebog. Hartwood is located on the left hand side with Bowhousebog in the center of the images. These visuals show the predominantly open landscape changing to mixed woodland with areas of open ground which are being maintained around Hartwood and Bowhousebog. The turbines shown above Hartwood on the second image are part of an existing windfarm approval being pursued by an external party and do not form part of the LMP proposals.

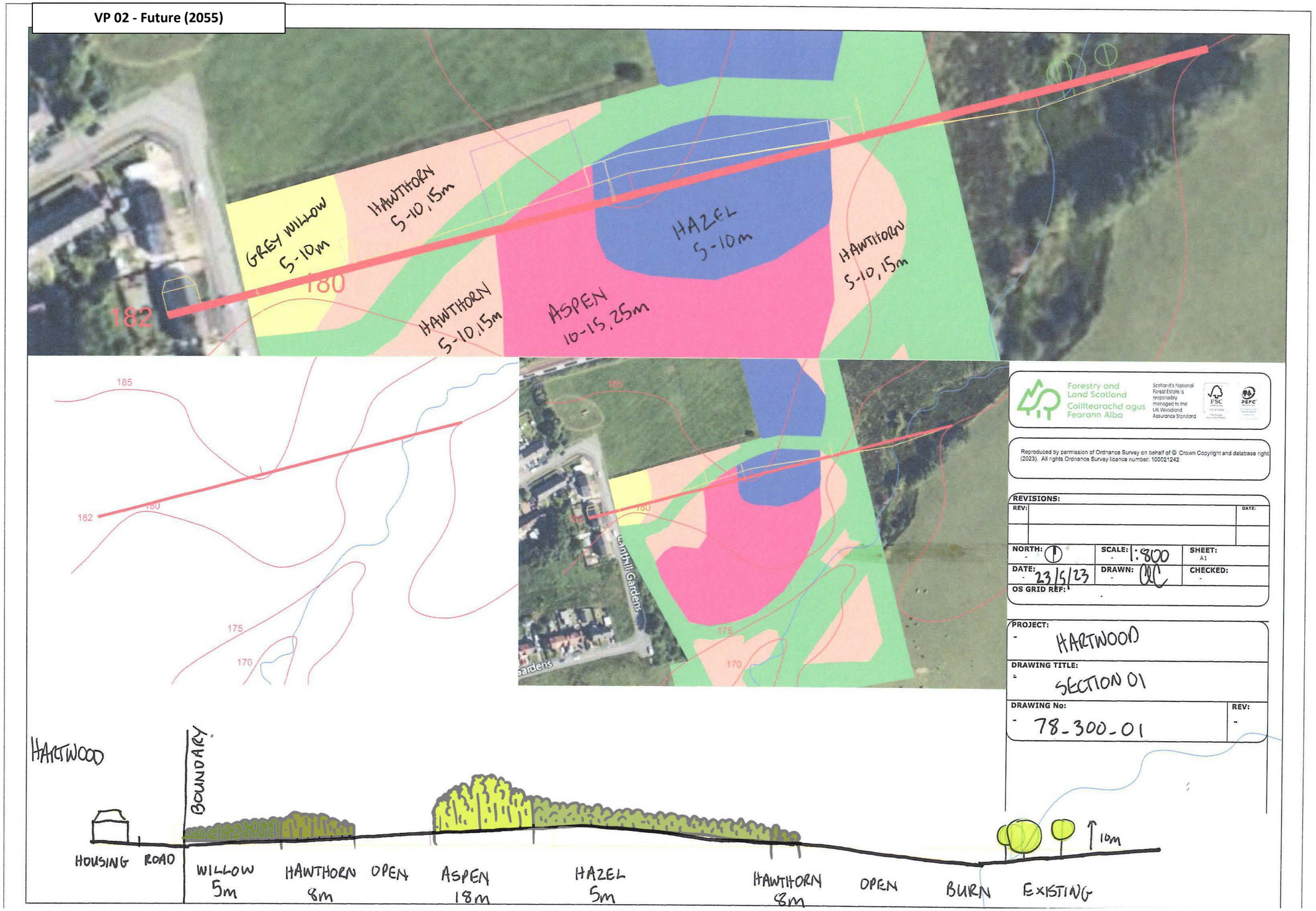
VP 00 - Current (2023)

VP 00 - Future (2055)

VP 01 – This visual outlines the likely changes to the view looking south from Canthill Gardens (Hartwood), towards Allanton. The LMP proposals will have little impact on this view: existing trees planted along the South Calder Water prior to FLS acquiring the site will gradually become more visible, while most of the proposed new planting will be screened behind existing trees along the watercourse on the left hand side of the image. The mature conifers visible on the right hand side of the image are outwith the FLS landholding and LMP area.

VP 01 - Current (2023) / Future (2055)

VP 02 – This visual shows an elevation of how the new planting proposed to the East of Canthill Gardens will relate to the adjacent properties. The key visual is shown at the bottom of the image which shows a cross section of the proposed planting in the field directly opposite the residences. This is intended to convey the scale of trees in relation to the houses, with small shrubs immediately adjacent to the properties and larger broadleaved trees further back. This area of has been designed to provide improved visual amenity and recreational opportunities for the local community, while minimizing any impact on the adjacent houses.



VP 03 – This shows the current and future view looking south-east from the properties located along Hartwood Road. The field immediately in front of the properties will be retained as open ground, with most of the planting proposed on the far side of the railway line. As shown in the second image, this will have some impact on the views from these properties as the proposed planting matures. Views towards Allanton will be maintained and it will take a significant length of time before the new planting reaches the height shown here (represented around year 2055). Although predominantly coniferous in nature the new woodland visible from this location will have a varied appearance, with broadleaves within and on the edge of the conifer areas providing visual diversity and screening.

VP 03 - Current (2023)

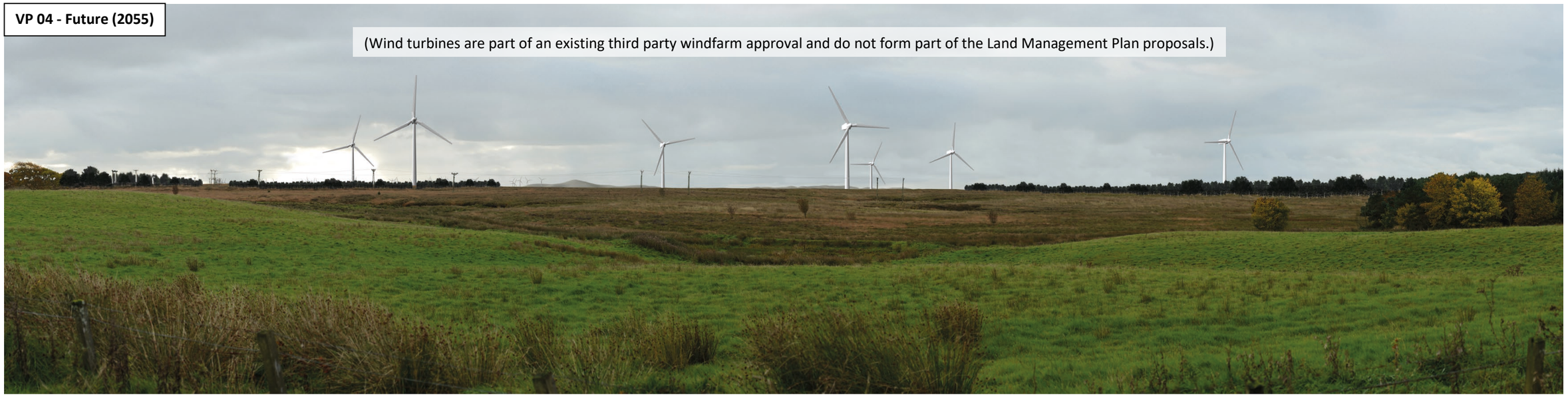
VP 03 - Future (2055)

VP 04 – This visual shows how the proposed management and peatland restoration will change the landscape viewed looking south from the Muiredge and Jersay Road. The existing conifer forest will be removed revealing a more open landscape with fringes of native broadleaved woodland and likely opening up views to Tinto hill South Lanarkshire. The wind turbines shown on the second image are part of an existing windfarm approval being pursued by an external party and do not form part of the LMP proposals.

VP 04 - Current (2023)

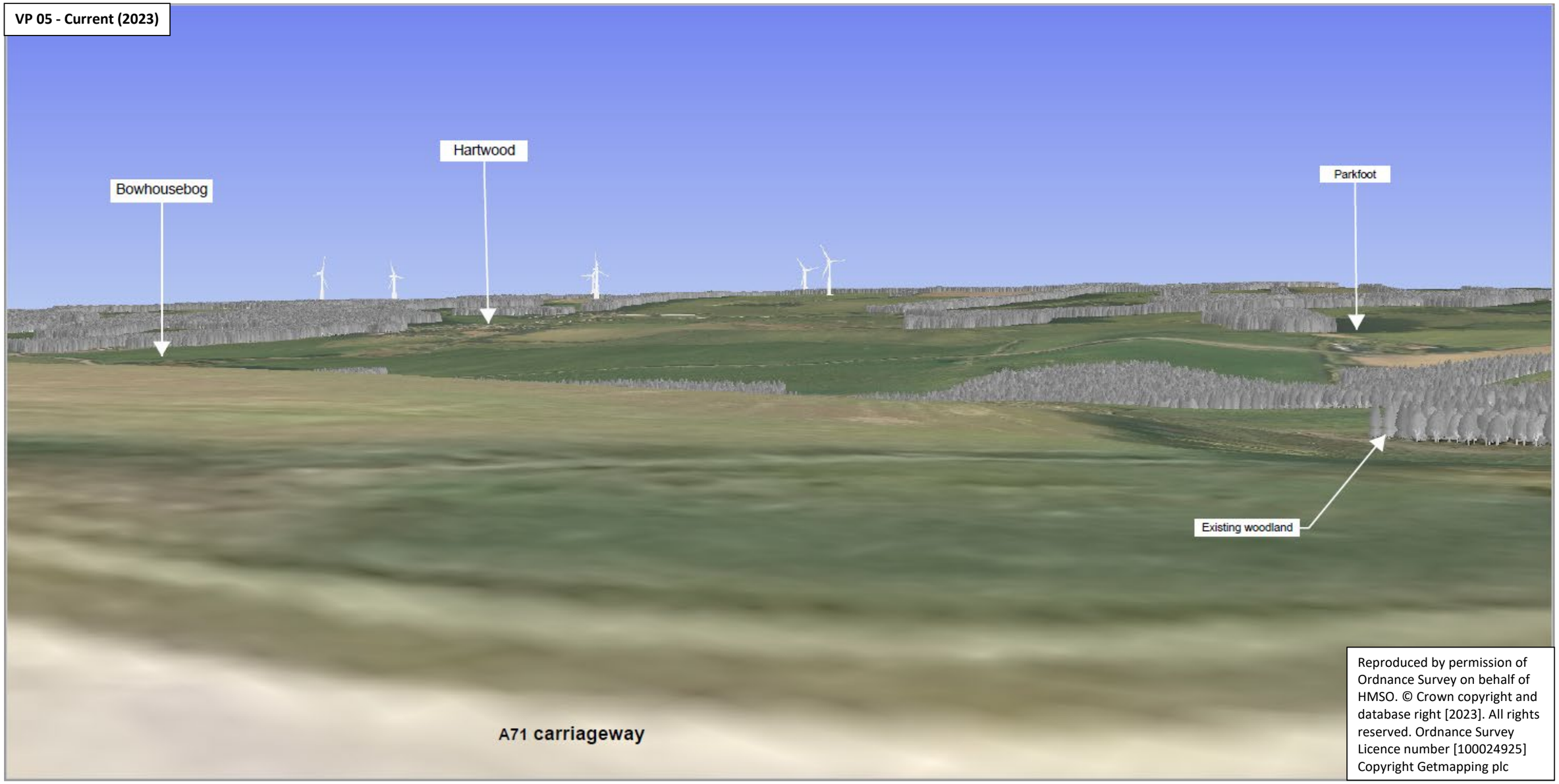
VP 04 - Future (2055)

(Wind turbines are part of an existing third party windfarm approval and do not form part of the Land Management Plan proposals.)

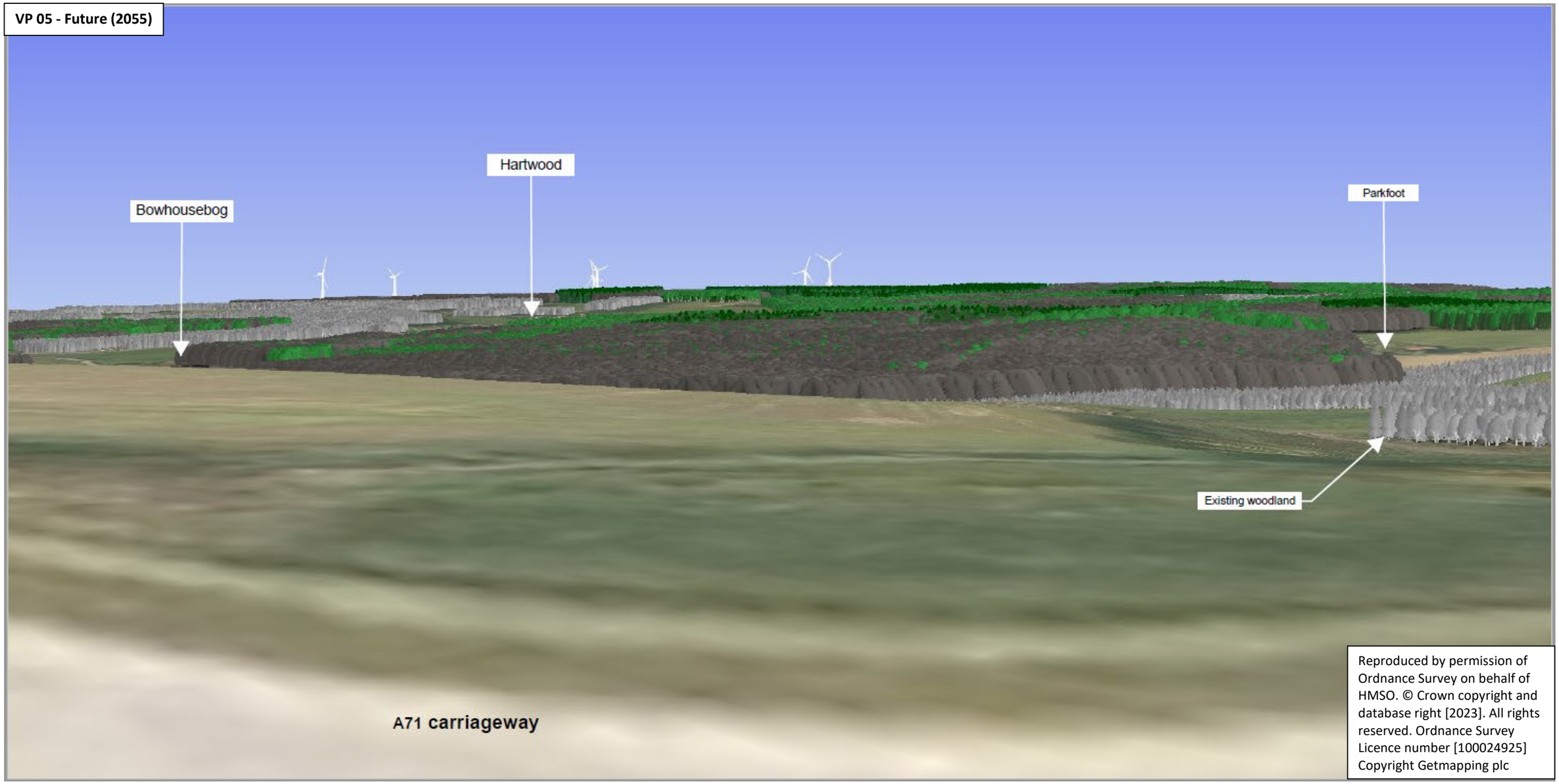


VP 05 – These visuals show the proposed new woodland within the landscape as viewed from the A71, looking north-west towards Hartwood. The images include areas of existing woodland (as recorded on the National Forest Inventory) in light grey as well as the proposed new planting at maturity (around year 2055). The second image is only broadly representative of where woodland will sit within the wider landscape and does not account for the numerous existing trees outside of woodland (e.g. hedgerows and farmland trees) in this area. The extensive area shown in dark grey on the second image will be composed of predominantly broadleaved trees while coniferous areas are shown in dark green. As can be seen, the more extensive areas of coniferous planting on the upper slopes will largely be obscured by the relatively flat landform and more diverse planting on the lower slopes. The wind turbines shown on both images are part of an existing windfarm approval being pursued by an external party and do not form part of the LMP proposals.

VP 05 - Current (2023)



VP 05 - Future (2055)



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APPENDIX VIII – Peat type/NVC summary table

Overview of the FC Soil Classification and related peat types, legislative EU Habitats Directive – Annex 1, UKBAP Priority Habitats, and NVC type. For each peat type, the range of likely peat depths are given. These are based on Pyatt's FC Soil Classification (1982) of peat types, terrain, and local experience. Where soil survey information is available (at 1:10,000 accuracy), it eliminates the need for site-specific peat depth surveys.

	FC Soil Group	Peat type	FC Soil Code	Peat depth (Pyatt 1982)	EU Habitats Directive Annex 1	UKBAP Priority Habitats	NVC type
Flushed peats	8 *Juncus* or basin bogs	*Phragmites* (or fen) bog	8a	0.5 – 4 m	Can include H7140	Lowland Fen + Upland Flush, Fen & Swamp	Various neutral or slightly base-enriched wetland types including M5, M9, M23, M25c, M27, M28, S25, S27, S28 and(non-NVC) MX
Flushed peats	8 *Juncus* or basin bogs	*Juncus articulatus* or *J. acutiflorus* bog	8b	0.5 – 4 m	Can include H7140	Lowland Fen + Upland Flush, Fen & Swamp	Description reads most like M6d, but *Juncus articulatus* is scarce in M6d and more common in its neutral counterpart M23a
Flushed peats	8 *Juncus* or basin bogs	*Juncus effusus* bog	8c	0.5 – 4 m	Can include H7140	Lowland Fen + Upland Flush, Fen & Swamp	M6c
Flushed peats	8 *Juncus* or basin bogs	*Carex* bog	8d	0.5 – 4 m	Can include H7140	Lowland Fen + Upland Flush, Fen & Swamp	M4 and M6a/b

Flushed peats	9 *Molinia* or flushed blanket bog	*Molinia*, *Myrica*, *Salix* bog	9a	0.5 – 4 m	H7130 (all occurrences) and H7150 (occurrences on blanket (not raised) bogs in unenclosed upland situations)	Purple Moor-Grass & Rush Pasture if in lowlands	M25a co-dominated by *Molinia* and *Myrica*
Flushed peats	9 *Molinia* or flushed blanket bog	Tussocky *Molinia* bog, *Molinia*, *Calluna* bog	9b	0.5 – 4 m	H7130 (all occurrences) and H7150 (occurrences on blanket (not raised) bogs in unenclosed upland situations)	Lowland M25 = Purple Moor-Grass & Rush Pasture; M15/16 = Upland+ Lowland Heaths	M25a and examples of M15b/M16 co-dominated by *Calluna* and *Molinia*
Flushed peats	9 *Molinia* or flushed blanket bog	Tussocky *Molinia*, *Eriophorum vaginatum* bog	9c	0.5 – 4 m	H7130 (all occurrences) and H7150 (occurrences on blanket (not raised) bogs in unenclosed upland situations)	Blanket Bog	M25a on deep peat, and M20-M25 intermediate (but abundant *Eriophorum vaginatum* suggests a lack of flushing)
Flushed peats	9 *Molinia* or flushed blanket bog	Non-tussocky *Molinia*, *Eriophorum vaginatum*, *Trichophorum* bog	9d	0.5 – 4 m	H7130 (all occurrences) and H7150 (occurrences on blanket (not raised) bogs in unenclosed upland situations)	Blanket Bog	M17 (but abundant *Eriophorum vaginatum* suggests a lack of flushing)
Flushed peats	9 *Molinia* or flushed blanket bog	*Trichophorum*, *Calluna*, *Eriophorum*, *Molinia* bog (weakly flushed)	9e	0.5 – 4 m	H7130 (all occurrences) and H7150 (occurrences on blanket (not raised) bogs in unenclosed upland situations)	Blanket Bog	M17 (but abundant *Eriophorum vaginatum* suggests a lack of flushing)
Unflushed peats	10 *Sphagnum* (or flat or raised) bogs	Lowland Sphagnum bog	10a	0.5 – 12 m	H7110, H7120 (all occurrences) and H7150 (occurrences on raised peat surfaces in agricultural lowlands)	Lowland Raised Bog	Mostly M18 but can include some M17, M19, M20 and small M1/2/3 bog pools
Unflushed peats	10 *Sphagnum* (or flat or raised) bogs	Upland Sphagnum bog	10b	0.5 – 12 m	H7110, H7120 (all occurrences) and H7150 (occurrences on raised peat surfaces in agricultural lowlands)	Blanket Bog	Mostly M17 but can include smaller areas of M18 and small M1/2/3 bog pools in the wetter parts
Unflushed peats	11 *Calluna*, *Eriophorum*, *Trichophorum* (or unflushed blanket) bog	*Calluna* blanket bog	11a	0.5 – 4 m	H7130 (all occurrences) and H7150 (occurrences on blanket (not raised) bogs in unenclosed upland situations)	Blanket Bog	M19 (relatively dry and strongly *Calluna*-dominated forms)

Unflushed peats	11 *Calluna*, *Eriophorum*, *Trichophorum* (or unflushed blanket) bog	*Calluna*, *Eriophorum vaginatum* blanket bog	11b	0.5 – 4 m	H7130 (all occurrences) and H7150 (occurrences on blanket (not raised) bogs in unenclosed upland situations)	Blanket Bog	M19
Unflushed peats	11 *Calluna*, *Eriophorum*, *Trichophorum* (or unflushed blanket) bog	*Trichophorum*, *Calluna* blanket bog	11c	0.5 – 4 m	H7130 (all occurrences) and H7150 (occurrences on blanket (not raised) bogs in unenclosed upland situations)	Blanket Bog	M17 and, where blanket bog surface has dried out to some degree as a result of draining and/or burning (and *Eriophorum vaginatum* very sparse or absent), M15/M16
Unflushed peats	11 *Calluna*, *Eriophorum*, *Trichophorum* (or unflushed blanket) bog	*Eriophorum* blanket bog	11d	0.5 – 4 m	H7130 (all occurrences) and H7150 (occurrences on blanket (not raised) bogs in unenclosed upland situations)	Blanket Bog	M20
Unflushed peats	14 Hagged / eroded bog	Shallow hagged eroded bog	14	0.5 – 4 m	H7130 (all occurrences) and H7150 (occurrences on blanket (not raised) bogs in unenclosed upland situations)	Blanket Bog	Hag tops mainly M19 but can also include M17 and, where more dried-out, M15/16 and (driest) H12. Bare peat, M3, M6, M17, M19 or M20 in depressions between hags
Unflushed peats	14 Hagged / eroded bog	Deeply hagged eroded bog	14h	0.5 – 4 m	H7130 (all occurrences) and H7150 (occurrences on blanket (not raised) bogs in unenclosed upland situations)	Blanket Bog	Hag tops mainly M19 but can also include M17 and, where more dried-out, M15/16 and (driest) H12. Bare peat, M3, M6, M17, M19 or M20 in depressions between hags
Unflushed peats	14 Hagged / eroded bog	Pooled eroded bog	14w	0.5 – 4 m	H7130 (all occurrences) and H7150 (occurrences on blanket (not raised) bogs in unenclosed upland situations)	Blanket Bog	M1/2/3/17, pools with *Menyanthestri foliata* (no NVC type) and deeper unvegetated pools- of open water

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APPENDIX IX – Peatland Restoration: Forest-to-Bog methods

Restoration treatment method descriptions and specifications have been produced by several organisations over the years.

FLS values advice from Peatland Action NatureScot, and follows the terms and conditions set out in the terms and conditions of this grant funding.

This document serves to distil any advice and information published by NatureScot, and it should be noted that NatureScot will be publishing information notes on the various restoration treatment methods, and indeed is preparing a Restoration method compendium. Please read this document in conjunction with other sources of information.

FLS uses the FC soils classification system to categorise the various peat types. This is useful because these give us an indication of the peatland vegetation we would expect and indeed are aiming to restore in many cases. It is also useful because when considering 'forest to bog' sites when specifying restoration specifications, because the layout and density of drains is strongly correlated to peat type, and the foresters at time of woodland creation seem to have approached the drainage specifications in the same way.

Forestry Commission Soils Classification

The FC Field Guide 'The identification of soils for forest management' identifies and describes several different peat types. Within the FC classification, the peat types are classified according to dominant species found in the vegetation communities. This is governed or described by the same factors as that used by the Ecological Site Classification system, the Ellenberg values. The main environment factors that govern the vegetational community of peatlands are their nutritional status and their wetness (hydrological behaviour). Their nutritional status is strongly influenced by how peatlands receive water, such as from higher or surrounding ground (flushed peats) or through precipitation only (rain fed only, or unflushed peats).

Each peat type corresponds with a National Vegetation Classification type and UKBAP priority habitat, which is outlined in a summary table in Appendix III. Therefore, each peat type directly translates to a priority habitat for the purposes of assessment under The Environmental Impact

Assessment (Forestry) (Scotland) Regulations 1999' (as amended) and the Scottish Government's policy on Control of Woodland Removal.

Outlined in Table 1 below are several types of peatland that FLS will aim to restore. This will be on three scales:

1. Large peat catchment scale – notable iconic projects like Dalchork, Flanders and Lochar mosses
2. Medium, whole coupes and package of coupes within a block
3. Small, 'parts of coupes' scale.

Table 1 FC Soil Classification - overview of peat types

PRIORITY HABITAT TYPE	FC SOIL TYPES (PEAT TYPES)	TYPICAL FORESTRY MODIFICATIONS	SCALE OF PEAT TYPE WITHIN NFE	ESTIMATED AREA OF PEAT TYPE ON THE NFE
Blanket bog (BB)	**Flushed blanket bogs (9)**	Deep ploughed ridges and furrows, intensively ploughed drains	Can cover large areas, especially on long slopes leading into riparian zones. Also found locally within unflushed peats.	40,400 Ha Likely that just under half of this will be restored.
	Unflushed blanket bogs (11)	Medium ploughed ridges and furrows, with a low to medium intensity of ploughed drains	Probably the greatest extent of peatland on the NFE	91,800 Ha Likely that just under half of this will be restored.
	Upland or intermediate bogs (10b)	Deep ploughed ridges and furrows and ploughed drains. Very similar to LRBs	More than is mapped. Many areas mapped as included within 11 and 9 peat types. Resolution and preciseness issue.	5,000 Ha – often under-represented on JHI maps. All of this will be restored.

Lowland raised bog (LRB)	**Lowland Raised bogs (10a)**	Medium to deep ploughed ridges and furrows. Large hand and machine dug drainage channels sometimes, some predating afforestation.	Many sites, some large, but many small (<30 Ha). Found in Lowlands, Carse of Stirling, and South. Also Drumfern in Lochaber. Amounts total between 2000-3000 Ha.	2,400 Ha – under-represented due to JHI maps covering a large proportion of this type, and incorrectly categorising it as an 8. All of this will be restored.
Upland flushes, fens and swamps	**Parts of blanket bogs (9), and Basin bogs (8)**	Intensive drainage. Usually grew very large trees but only because of the drainage density.	Usually a small component of a larger peat catchment.	Incorporated above.
Hagged peatland	**14**	Deep ploughed, often unevenly and in small patches. Drainage low intensity but effective, along with the hagged nature of these areas.	Usually a small component within a larger peat catchment. Usually only smaller areas were planted, larger areas avoided. Largest expanses are on upland sites on the upper reached of what was regarded plantable.	5,400 Ha. Mostly on open ground, but likely that all of this will be restored. Hags on open ground are thought to act as very high emitters of carbon dioxide.

Forest-to-bog restoration methods

Afforested peatland restoration, known more commonly as 'forest-to-bog' restoration, is thought to take a least 10 years (after re-wetting) to change from acting as a carbon source to a carbon sink. Therefore, there is an inherent urgency to begin restoration as soon as possible after felling, with respect to the Scottish Government target of net zero carbon emissions by 2045.

Restoration will be achieved through the use of a number of re-wetting techniques. The most common techniques used in forest-to-bog restoration are listed below. These methods are usually employed together, across a site in a sequence, beginning at the upper areas and working downslope towards main water courses, or where water leaves the site. Note, these methods are under constant development.

- **Peat dams**: usually the most effective way of blocking drains and furrows, where appropriate, and dispersing water across a peatland, whether on open or a forest-to-bog project. **Re-profiling the drains** is also carried out at the same time as installing peat dams, but only if they do not have high peak or base flows, indicated by the absence of vegetation in and on the sides of the drain.

Figure 1a. Peat dams installed at Criadadh More, Isle of Mull on 19/03/2015.

Figure 1b. Site response after almost three growing seasons on 07/09/2017.

Figure 1c. Site response after seven growing seasons on 20/11/2021.

- **Stump flipping and ground smoothing**: this un-modifies the ploughed ridges and furrows which in most cases, if left in situ suppresses the water table and development of peatland vegetation, and promotes regeneration of negative indicators such as too much Calluna or non-peatland species or undesirable non-native and native trees. Care is needed when restoring sites planted with Lodgepole pine, as the root-ball penetrates into the peat much deeper than the flat root plate of Sitka spruce. When flipping LP stumps, it is undesirable to bring catotelmic (deeper) peat to the surface, so a 'light touch' ridge and furrow reprofiling should be carried out if possible, leaving stumps in situ, to smooth most of the surface. This is only possible where stumps were cut low using a shears head (because stumps of standard height will throw the tracks on the machine), or access routes will need to be carefully planned and stump flipped, to allow access to particular parts of the site

Figure 2. Gow moss after clear felling prior to restoration.

Figure 2. Gow moss after site has been treated using stump flipping and ground smoothing techniques.

- **Backfill trenches (trench linear bunding, but without a high bund)**: this counteracts excessive lateral flow of water within the peat, usually promoted by historic events or modifications, such as fire, peat bank cutting, or peat cracking. This can result from the ploughing and draining carried out during afforestation, and the subsequent drying and suppressing effect of the mature trees on the peat and water table.

Figure 3. Example of backfill trenches at Gow moss. Note the positive indicators – the high water table and extent of cotton grass.

- **Peat hag and gully re-profiling**: this is used to repair excessive erosion of peatlands, usually in an upland setting. Gullies can be caused by excessive surface water run-off, or promoted by artificial drains catching water across a natural shedding area, and bringing it to a confluence where erosion begins and continues indefinitely. Hags probably have several triggers, including saturated peats, freezing and unfreezing conditions, over grazing, and perhaps are a legacy of the mini-ice age in the 1700s. Many appear to develop from peat pipes which eventually collapse.

Figure 5a. Extensive peat haggs at Glen Affric prior to restoration.

Figure 5b. Re-profiling of peat hags and the resulting higher water table.

Figure 5. Landscape perspective of Beinn a Mheadhoin before restoration.

Figure 6. Landscape perspective of Beinn a Mheadhoin after restoration.

Deciding upon restoration methods (to be replaced by separate document)

In deciding upon restoration treatments, the methods and specifications used in all forest-to-bog projects are often very similar. Usually, a combination of the techniques described above will be applied. Peat damming and re-profiling of forestry drains is always carried out. Stump flipping and ground smoothing is carried out on a majority of sites, and back fill trenching is usually only carried out where cracking is present or where the water table is lower than can be explained by the drainage network or other modifications. The main aim across all sites is to restore the peatland's hydrology and behaviour by raising the water table.

Details of restoration plans cannot be confirmed until after the trees have been clear felled as the standing trees or windblow obscures a proper view of the site. Access across the site, giving a clear view of the lie of the land, localised undulations, and where the flushed areas are, is needed to determine the exact location of drains, to determine their status in terms of peak flow and base flows, allowing decisions to be made on the positioning of peat dams and spotting if the underlying peat is cracked or not. Some indication of the positions and intensity of drainage may be apparent from studying aerial photographs, but usually only where Sitka spruce plantations are uniformly growing and not windblown.

Despite this, the layout of drains is often fairly predictable, most individual forests were ploughed and drained by the same people using the same machines to the same specifications. The foresters who designed afforestation drainage had a very high technical knowledge of how to drain peatlands in an optimal manner. There is a strong correlation of drainage density and peat

type as described in table 3. In our experience, estimates of the number of peat dams required can be made during the contract procurement stages of the project.

Table 2 Overview of typical drainage intensity or spacing of drainage by peat type.

Peat type	Typical drainage intensity	Typical spacing
8	Very dense, wettest peat of all	5 to 15 metres. Drainage plough often incorporated into ploughed ridges and furrows, if not all
9	High density of drains	10 to 25 metres
10	Very dense	5 to 15 metres. Drainage plough often incorporated into ploughed ridges and furrows, as well as across ridges/ furrows
11	Low density	30 to 50 metres.
14	Low density	20 to none. Very variable depending on topography and layout of hags.

Peat cracking lowers the water table, drying the peat, especially for longer periods and more thoroughly during drought conditions. This increases the amount of oxidisation of the peat, leading to high carbon dioxide emissions. Identifying areas of peat cracking is easier after clearfell as the patches of drier than expected peat are possible to identify in the context of the topography. Understanding the landscape and terrain helps to find which areas are most likely to contain cracking, such as slightly raised areas and hummocks, or where the plantation trees have grown better. In addition, a thorough survey of the drains and their loading, peak flows, and depth of peat below the base of the drain can only safely and efficiently be done after the trees have been clear felled.

Table 4 (on the next page) is in draft, and will be developed and expanded upon into a decision support tool, appendix Vii.

Table 4 Decision flow approach in deciding upon restoration treatments to be employed.

FACTOR	QUESTION	ANSWER	CONCLUSION
Drainage	Are the drains scoured?	Yes	Do not block, unless base flow and peak flow will be significantly altered by blocking and distributing water out of the feeder drains upstream
		No – the sides are vegetated, showing that peak flows and base flows are consistently low throughout the year	Go to next question
	Are the bases of drains on at least 50cm of peat?	Yes	Block drains using *standard peat dams*, and re-profile drains
		No, and base flow is very low	Block drains using *peat plugs* (similar to peat dams, but without excavating oxidised peat from underneath the drain base) and re-profile drains
Ridges and furrows	Are the furrows filled with sphagnum and the height difference between the top of ridges and sphagnum less than 25cm?	Yes, and the water table appears to be consistently high, and sphagnum is also found growing on the original ground surface and on tops of the ridges.	Do not Stump flip and ground smooth
		No, the plough ridges and furrows are prominent, and sphagnum is confined to the base of the furrows. The water table is low, especially when comparing the impact of the drains	Stump flip and ground smooth
Peat cracking	Is the peat cracked?	Yes	Install back fill trenches no longer than 25m, and across the slope,

			at right angles to the furrow and ridges if possible, but up to 45 degrees to them if not.
Hagged peat	Are there hags present on the site?	Yes	Hag re-profile these areas