FLS - LAND MANAGEMENT PLAN

Name West Loch Ard

Approval Date 13./03./2023

End Date 13./03./2033

DR Anderson

Signature

Scottish Forestry
Coilltearachd na h-Alba

Central Region

WEST LOCH ARD

Land Management Plan

Approval date:

Plan Reference No:

Plan Approval Date:

Plan Expiry Date:

We manage Scotland's National Forest Estate to the United Kingdom Woodland Assurance Standard – the standard endorsed in the UK by the International Forest Stewardship Council® and the Programme for the Endorsement of Forest Certification. We are independently audited.

Our land management plans bring together key information, enable us to evaluate options and plan responsibly for the future. We welcome comments on these plans at any time.

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

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FORESTRY AND LAND SCOTLAND - Application for Land Management Plan Approvals in Scotland

Forest Enterprise - Property

Region:	Central
Woodland or property name:	West Loch Ard
Nearest town, village or locality:	Aberfoyle
OS Grid reference:	NS 444975
Local Authority district/unitary Authority:	Loch Lomond and Trossachs National Park

Areas for approval

	Conifer	Broadleaf
Clear felling	177.0 ha	7.0 ha
Selective felling	669.0 ha	0.0 ha
Restocking	114.6 ha	73.3 ha
New planting (complete appendix 4)	0 ha	0 ha

1. I apply for Land Management Plan approval for the property described above and in the enclosed Land Management Plan.
2. I apply for an opinion under the Forestry (Environmental Impact Assessment) (Scotland) Regulations 2017 for the forestry projects detailed in my application.
3. I confirm that the initial scoping of the plan was carried out with FLS staff on 18th December 2019.
4. I confirm that the proposals contained in this plan comply with the UK Forestry Standard.
5. I confirm that the scoping, carried out and documented in the Consultation Record attached, incorporated those stakeholders which the SF agreed must be included.
6. I confirm that consultation and scoping has been carried out with all relevant stakeholders over the content of the of the land management plan. Consideration of all of the issues raised by stakeholders has been included in the process of plan preparation and the outcome recorded on the attached consultation record. I confirm that we have informed all stakeholders about the extent to which we have been able to address their concerns and, where it has not been possible to fully address their concerns, we have reminded them of the opportunity to make further comment during the public consultation process.
7. I undertake to obtain any permissions necessary for the implementation of the approved Plan.

Signed Cass Mc Ginnes ..... Signed DR Anderson .....

Regional Director AP Conservator

Region Central Conservancy Perth & Argyll

Date 3 August 2021 **Date of approval** 13/3/2023

Date approval ends 13/3/2033

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WLA VP1
WLA VP2

1.0 Summary

1.1 Introduction

West Loch Ard is an amalgamation of two former separate plan areas known as Corrie and Corriegrennan. The decision was taken to refine these two plan areas in to one due to their very similar characteristics and objectives. The plan area is heavily dominated by productive conifers running from the river basin of the Duchray up on the shoulders of the Ben Lomond range, with the riparian zones gradually being repopulated by native species. Due to a relative remoteness the plan area is less visited by members of the public and is strategically a high production area of Scotland's forest and land estate.

The plan area is centrally located within the Loch Lomond and Trossachs National Park, sitting south east of the summit of Ben Lomond but connected to a much wider forested area which connects the village of Aberfoyle to the Ben Lomond range across the upper Forth Valley, taking in Loch Ard, Loch Chon and stretching across to Loch Katrine.

1.2 Objectives

• Review productive potential and seek to maximise this potential using Sitka spruce as the predominant species, whilst ensuring compliance with UKFS standards.

• Target to establish diversity where it is most suited and effective protection is possible.

• Seek to balance the outputs and move toward a naturalised and sustainable forest.

• Design a coupe structure and restocking strategy that take account of flood risk and the potential negative impact on water quality in the Duchray catchment from acidity.

• Allow for retention of some older stands in the medium term so as to aid restructuring at a gradual pace.

• Protect notified features in Ben Lomond SSSI, creating buffer zones between it and commercial planting.

• Manage riparian areas to promote a variety of habitats for wildlife and improve links between the SSSI and the Duchray Water.

• Seek opportunities to improve habitats for black grouse.

• Establish an effective deer control programme

1.3 Key proposals

Total Plan Area	2400 (ha)
Planned operations	
Felling	177 (ha); 95,215 (m^3) of conifer; 7 (ha); 1,156 (m3) of broadleaf
Thinning	669 (ha).; 31,500 (m^3)
Restock	114.6 (ha) of conifer; 73.3 (ha) of broadleaf.
New planting	0 (ha)
Roads and tracks	1525 roads (m); 7620 tracks (m); 75 ramps (no.)
Public access	There are no planned designated routes, access will remain under SOAC.

1.4 Species diversity

Species group	**2021**	**2031**	**2041**
Sitka spruce	49.9%	45.8%	42.1%
Larches	1.8%	1.2%	1.2%
Western hemlock	0.1%	0.00%	0.00%
Scots pine	1.4%	1.6%	1.5%
Other Conifer	8.8%	8.0%	6.6%
Alder	0.1%	0.1%	0.1%
Native broadleaves	3.3%	5.7%	7.0%
Other broadleaves	1.1%	1.1%	1.1%
Open	33.5%	36.5%	40.4%

These figures exclude permanent open hill ground.

1.5 Major issues

Issue	Description/mitigation
Issue 1	The northern area is less well roaded and requires improved access to reach mature stands.
Issue 2	A previous imbalance has seen the southern area of the plan more intensively worked, this will need redressed to aid restructuring of large similar aged crop.
Issue 3	Threat of infection from P.Ramorum disease impacting Larch species, targeting a 20% removal of Larch in the area by the end of 2023.
Issue 4	Protection of water quality and run-off. The plan area mainly feeds in to the Duchray which historically floods the main areas of Aberfoyle, as well as forming an important breeding ground for fish species.

1.6 Standards and guidelines

This plan takes account of Scottish Government and Forestry and Land policy and strategy. It has been developed in accordance with the latest UKFS Guidance and is audited under the UK Woodland Assurance Standard. Forestry and Land Scotland woodlands are certified as being sustainable by both FSC and PEFC. Proposals for removing larch are based on Forestry and Land Scotland's 'Strategy for Managing Larch', July 2019.

1.7 Consultation

During the development of this plan we have consulted publically with stakeholders known to have an interest in this plan area.

A list of stakeholders and their response can be found in Appendix 1 of this document.

1.8 Contacts and further information

For further information on this or any other land management plan please contact:

Forestry and Land Scotland
Aberfoyle Office
Aberfoyle
FK8 3UX

tel. 0131 370 5674

2.0 SF regulatory requirements

2.1 Context and rationale for concept

West Loch Ard is a relatively remote area of forest forming part of the collective woodlands that cover the Loch Ard basin. Nestled away from the majority of public users and up against the Lomond range it forms part of Scotland's high production forests. There is a limited thinning programme and no management benefit to Continuous Cover Forestry (CCF), though water runoff in to the Duchray Water is something that must be managed and slowed where possible. Most areas of the plan are managed under a clearfell and restock approach due to the age of the current crop, however future thinning opportunities should/will be sought. Diversity improvement is being focused around the riparian corridors with the use of broadleaf species, opportunities for alternative conifers are limited due to climatic conditions.

2.2 Proposed felling in years 2022 – 2032

Phase	Area (ha)	Volume (m^3)
1	76.0	40,361
2	108.0	56,010
	184.0	**96,371**

Table 2.1 Summary of felling proposals

Map M2 shows the coupes for which approval is being sought for clearfelling and Map M3 those areas which might be thinned during the plan period. Depending on species and site conditions separation in time should ensure that young trees in adjacent coupes are at least 2m high before a coupe is felled. The future habitats map (M4) should also be referred to.

Volume figures in table 2.1 are approximate and include the volume of broadleaf contained within a specific coupe. This plan has no active broadleaf removal programme and the approval request is based upon being able to establish wind firm and sensible boundaries. Where possible native species will be left to provide habitat and a future seed source.

2.3 Proposed thinning in years 2022 – 2032

Phase	Area (ha)	Volume (m^3)
1	335	15750
2	335	15750
	669	**31500**

Table 2.2 Summary of thinning proposals

Thinning opportunities within the plan area are relatively few at this time, this is due to timber crops being too young or old, though the plan area is suited to an extensive thinning programme which should be explored in future iterations of the plan.

An allowance has been included for thinning up to 15m from the centre line of the forest road. This should not be viewed as a request to sterilise road sides, but to proactively manage vegetation over 10cm dbh that can directly impact the road network. Details of the proposed thinning areas can be found on Map M3.

2.4 Proposed restocking in years 2022 – 2032

Phase	Species	Area (ha)
1	Conifer/Broadleaf	37.9/21.0
2	Conifer/Broadleaf	76.7/52.3
		187.9

Table 2.3 Summary of restocking proposals

Restocking proposals are shown on map M4 and further details found in section 5.2. The overall objective has been to maintain a high level of production whilst introducing greater diversity and restoring large areas of plantation on ancient woodland sites.

There are 2 coupes carried over from the previous plan period to be planted in 2021/22 detailed in Table 2.3, these are still within the permitted fallow period of 2 years.

Where production is the key objective conifers will be planted at densities of approximately 2700 stems per hectare (sph) and broadleaves in the region of 3500 sph. Restocking will be within two years of felling unless Hylobius Management Support System indicates a longer fallow period is necessary. In the latter case planting will be carried out within five years. There are no implications for adjacency.

Where production is not the key objective target densities for planting, or natural regeneration, of native and non-native species, will vary depending on site objectives. On the majority of sites an overall density of at least 1600sph will be achieved; in transitional areas, such as upper treelines, lower densities, of between 500 and 1100sph, will be accepted, dependent on overall site objectives. Natural regeneration sites will be assessed five to eight years after felling. If it seems unlikely regeneration will become established by year 10, the site will be planted to achieve the desired stocking level at year 10.

Open areas will be allowed up to 20% tree cover. Sitka spruce regeneration will be kept within agreed tolerance limits on both open ground and in areas designated for broadleaved woodland. Small amounts of rhododendron are known to be present and appropriate measures to control this species will be put in place.

2.5 Access and roading in years 2022 – 2032

Phase	Type	Length (m)	Area (ha)
1/2	New roads	1525	1.1
1/2	Tracks/ramps	7620	1.5

Table 2.4 Summary of roads and tracks

Proposed roads and tracks are shown on map M5 and more detail is to be found in section 3.0.

2.6 Departures from UKFS guidelines

There are no proposed departures from UKFS guidelines.

2.7 Tolerance table

	Map Required (Y/N)	Adjustment to felling period [1]	Adjustment to felling coupe boundaries [2]	Timing of Restocking	Changes to species	Changes to road lines	Designed open ground [3]	Windblow Clearance [4]
SF Approval normally not required	N	Fell date can be moved within 5 year period where separation or other constraints are met	Up to 10% of coupe area	Up to 2 planting seasons after felling	Change within species group e.g. ever green conifers or broadleaves		Increase by up to 5% of coupe area	Individual trees, rows of trees or small groups of trees that are impacting on important infrastructure (as defined below*), because they have been destabilised or made unsafe by wind. The maximum volume of felling in exceptional circumstances covered by this approval is 40 cubic metres per Land Management Plan per calendar year.
Approval by exchange of email and map	Y		Up to 15% of coupe area	Between 2 and 5 planting seasons after felling subject to the wider forest and habitat structure not being significantly compromised		Additional felling of trees not agreed in plan Departures of more than 60m in either direction from centre line of road	Increase by up to 10% Any reduction in open ground within coupe area	Up to 5 ha
Approval by formal plan amendment may be required	Y	Felling delayed into second or later 5 year period Felling advanced into current or 2nd 5 year period	More than 15% of coupe area	More than 5 planting seasons after felling subject to the wider forest and habitat structure not being significantly compromised	Change from specified native species Change between species group	As above, depending on sensitivity	More than 10% of coupe area Colonisation of open areas agreed as critical	More than 5 ha

NOTE

1 Felling sequence must not compromise UKFS in particular felling coupe adjacency. Felling progress and impact will be reviewed against UKFS at 5 year review.

2 No more than 1 ha, without consultation with SF, where the location is defined as 'sensitive' within the Environmental Impact Assessment (Forestry) 1999 Regulations (EIA).

3 Tolerance subject to an overriding maximum of 20% designed open ground.

4 Where windblow occurs, SF must be informed of extent prior to clearance and consulted on clearance of any standing trees.

3.0 Forestry projects that require screening opinion

3.1 Proposed deforestation

There are no deforestation proposals.

3.2 Proposed afforestation

There are no afforestation proposals.

3.3 Proposed forest roads, tracks and other facilities

This section describes works covering construction of, roads, tracks, ramps and other facilities in West Loch Ard LMP area. It is included to give an indication of the number of facilities required to successfully deliver the plan. Proposed roads and tracks are shown on map M5.

A screening opinion for facilities will be requested as and when required during the plan period.

Several new lengths of road will be required to facilitate access to harvesting coupes for machinery and timber lorries. The total length is about 1525m with a footprint about 7m wide. The nominal area is 1.1ha. The proposed roads will be of standard construction, with a waterbound surface (not tarmac), with one layby at about 500m intervals and with a turning point at the end. A proportion of the materials required to construct the road may be sourced from within the excavation corridor the remainder will come from the closest available FLS quarry.

Approximately 7620m of ATV tracks will be required to facilitate harvesting, silvicultural and deer management operations. In addition up to 75 ramps will be required to allow harvester/forwarder access into coupes that are to be felled during the design plan period.

ATV tracks will be constructed in line with the principles described in the SNH guidance on Constructed Tracks in the Scottish Uplands. Construction will also conform to the Forests and Water Guidelines (Fifth Edition). During construction ground disturbance will be kept to a minimum. ATV tracks will not be treated as permanent features; once operations are complete tracks will be allowed to grass over and the running surface and side batters will be left in a condition that will promote vegetation regeneration. Tracks will be constructed with a top-side drain and will have regular drainage cut-offs to prevent erosion of the trackside drain. No water from the trackside drains will discharge directly into any watercourse.

Indicative positions of the tracks are shown on the roads and tracks map and final positions will be within ± 60m of these. The actual line will be planned to minimise landscape impact and ground disturbance, reflecting existing topography, avoiding steep gradients where possible and avoiding sensitive habitats. ATV tracks will be approximately 2m wide and the nominal area amounts to 1.1ha. At this time no forwarder tracks have been deemed necessary, if required these will be subject to relevant approvals being obtained. Forwarder tracks will not be treated as permanent features and will be removed once they are no longer required.

Ramps will be approximately 3m wide and up to about 15m long. The total nominal area is approximately 0.3ha. They will not be treated as permanent features and will be removed following

operations. The final number and location of the ramps will be determined at the time of operations but we believe one ramp per 100m of road/coupe interface will be sufficient.

A summary of individual roads and tracks is provided in Section 3.5.

3.4 Proposed quarries

There are several quarries within the plan area (map M5), only one is active. Proposals to re-open or extend quarries will be the subject of a separate screening request.

3.5 Summary of works requiring screening opinion

Coupe	Length (m)	Area (ha.)	Purpose	Landscape	Water quality	Archaeology	Biodiversity	Access	Recreation	Material
33003	560	0.1	ATV access for forest and deer management	no major impact	standard protection measures	no known issues	no significant issues	from forest road	n/a	found on site
33007	540	0.1	ATV access for forest and deer management	no major impact	Co-ordinate with Scottish Water	adjacent to Katrine water tunnel	no significant issues	from forest road	n/a	found on site
33008/22/35	2410	0.5	ATV access for forest and deer management	Partially visible in distance from Craigmore	standard protection measures	no known issues	no significant issues	from forest road	n/a	found on site
36001	1130	0.2	ATV access for forest and deer management	no major impact	standard protection measures	no known issues	no significant issues	from forest road	n/a	found on site
36018	470	0.3	new forest road	no major impact	standard protection measures	no known issues	no significant issues	from forest road	n/a	nearest FES quarry
36018	550	0.1	ATV access for forest and deer management	no major impact	standard protection measures	no known issues	no significant issues	from forest road	n/a	found on site
36020	870	0.6	new forest road	no major impact	Co-ordinate with Scottish Water	Bailey bridge required to form temporary crossing of Katrine Water tunnel and associated infrastructure	site adjacent to Duchray Water	from forest road	n/a	nearest FES quarry
36020	770	0.2	ATV access for forest and deer management	no major impact	Co-ordinate with Scottish Water	Bailey bridge required to form temporary crossing of Katrine Water tunnel and associated infrastructure	site adjacent to Duchray Water	from forest road	n/a	found on site

36029	185	0.1	new forest road	Partially visible in distance from Craigmore	standard protection measures	no known issues	no significant issues	from forest road	n/a	nearest FES quarry
36029	1660	0.3	ATV access for forest and deer management	Partially visible in distance from Craigmore	standard protection measures	no known issues	no significant issues	from forest road	n/a	found on site

4.0 Land management plan

4.1 Introduction

This is a re-submission of a plan first developed by Forest Enterprise Scotland (now Forestry and Land Scotland) in 2006. This plan describes proposals to continue the work of restructuring described in the previous work but sets it in the context of revised aspirations and policy. A summary of the plan proposals is found in section 1, whilst sections 2 and 3 deal with Scottish Forestry regulations and EIA screening requirements respectively. This section covers the context, key issues and the broad proposals of the plan. Section 5 provides greater detail on management proposals summarised in previous sections. Section 6 repeats the critical success factors and section 7 summarises broad management prescriptions. Background information is found in section 8. Several appendices deal with the consultation process, proposed quarry development and provides a summary of management proposals in tabular form.

4.2 Setting and context

The West Loch Ard Land Management Plan (Map M1) sits on the ridged eastern shoulders of the Ben Lomond range, placed above and running down in to the Forth Valley basin. Directly surrounded by 3 other forest blocks and forming part of a much wider forest landscape (13,000 ha) covering the upper section of the Forth Valley catchment. The plan is located southwest of the village of Aberfoyle and accessed from the A81, the whole plan area sits within the Loch Lomond and the Trossachs National Park and ranges in height from 60m at the Duchray river up to a 507m summit just below Beinn Bhreac. The majority of the tree species are coniferous (60%) of which the majority is Sitka Spruce, diversity is generally limited to the areas directly surrounding the Duchray and Kelty watercourses, open hill ground also constitutes a significant part of the plan at 13% of the plan area.

4.3 Issues

Factors that have been taken into account in developing the LMP proposals include:

- Large areas of continuous even aged conifer woodland
- Flooding mitigation
- Waterbody acidity mitigation
- Limited productive conifer options for diversity due to climate

4.4 Key challenges and liabilities

Challenges to the plan are:

- Management of the felling programme over the entire Duchray catchment.

- Sitka creep on to open ground
- Patchy tree growth in some areas
- Ingress of heather before canopy closure
- Third party interests – Water Tunnel & National Grid distribution power line.
- Resident deer population and ingress from neighbouring estates.

4.5 Concept

4.6 Management objectives

Plan objectives are to be found in section 1.2.

5.0 Management plan proposals

5.1 Management

Management will be guided by the key objectives of the plan. The main management technique will be clearfelling and re-planting of commercial woodland; where there is adequate seed source natural regeneration may be used when establishment of native woodland is the objective.

5.1.1 Clearfelling

Table 2.1 (section 2.2) indicates net felling area and volume figures for the plan area beyond the first two phases. These values are approximate and coupes will be surveyed to provide more precise figures prior to felling.

Management will be guided by the key objectives of the plan. Coupes for which approval to fell is being sought are shown in the management map (M2). All harvesting operations will be carried out in accordance with the UK Forestry Standard Guidelines, and Forests and Water Guidelines (5th edition). Prior to operations any known heritage features will be marked to ensure protection during the operation. Public access will be managed so as to reduce disruption without compromising safety. The aqueducts, which provide water to Glasgow from Loch Katrine, pass through the eastern part of the block or run along part of the boundary. Scottish Water will be informed, in advance, of any operations likely to impact on the tunnels. Temporary bailey bridges will be built to allow access across the tunnels for harvesting and forest management.

The proposed felling sequence is a balance between achieving optimum economic return and timber quality, minimising risk of wind damage and retention of some of the older trees in the medium term. Models recently developed by Forest Research and FLS suggest optimum cost recovery and timber quality is achieved when trees are between 40 and 50 years old. The

timing and spatial distribution of felling coupes fall within the parameters set out in the UK Forest Standard to minimise risk of flooding and deterioration of water quality. Retention of some stands for a longer period will aid restructuring, improving future resilience and achieving a better age class balance. Although wind risk has been assessed as being relatively low over large parts of the plan area, the first phase coupes have small areas of damaged trees within them. Other coupes of a similar age appear more stable at the present time and so felling will be delayed. Established native woodland in the FHN will be managed as long term retentions or minimum intervention. Some of these will form important components in a natural flood reduction strategy. In the former there may be some productive potential but in the latter operations will be restricted to those which benefit the environment.

5.1.2 Thinning

With relatively little steep ground and good access to the national road network, West Loch Ard is ideally suited to well-timed thinning operations to improve timber quality and stand resilience. Assessment of thinning potential is based upon the following criteria –

- Planting year around 2010
- Slope ≤30%
- DAMS score (exposure) ≤14
- Soil type (from maps)
- Accessibility

A more detailed assessment of the stands will be made at the operational planning phase and a final decision whether to proceed with the work will be made at that point. First thinning will be to marginal thinning intensity, dependent on survey data. Racks will be cut at appropriate spacing and matrix trees taken to achieve the recommended thinning intensity. Volume from first thinning is likely to be in the order of 50m^3ha.

Mainly for conservation reasons it will be beneficial to carry out a light thinning in some spruce stands on native woodland sites. This might be halo thinning around native tree species or opening up small areas to improve light conditions for ground flora. The ability to carry out this work will depend on site priorities, an assessment of stand stability, access and availability of skilled operators. The volume of timber from this work will be substantially less than marginal thinning intensity amounting to perhaps no more than 10m^3ha over the plan period.

Management of native woodland sites might also include removal of non-native species from younger stands. Volumes are likely to be relatively insignificant, in the order of 5m^3ha to 10m^3ha over the plan period.

Estimated volumes for thinning can be seen in Table 2.2 and the proposed thinning areas are identified on Map 3. Most thinning operations are undertaken on a 5 year cycle, judged upon a

pre-thin survey, therefore figures shown are approximate and mirrored in both phases of this plan.

5.1.3 Potential for Continuous Cover Forestry

There are no areas within this plan identified for continuous cover forestry.

5.2 Future habitats and species

Restock and future habitats maps are described in Map 4 and Tables 2.3, 5.3 & 5.4.

Due to water acidity issues experienced around the Duchray, as per best practice, there is no inclusion of Alder in the future habitats to keep the overall percentage as low as possible. Although useful for planting in wet areas and for rapid colonisation, Alder introduction should be kept to a minimum. There is no plan to actively remove existing or future natural regeneration of Alder.

Previously Larch was a component of the future habitats for West Loch Ard, all references have been removed and in most cases been replaced with either Norway Spruce, Scots Pine or native broadleaves.

Over the period of this plan there is an increase in the amount of open space as can be seen in Table 5.1, this is a factor of modern forestry practice and following current guidance to reduce tree lines away from watercourses. Showing these in a graphical form potentially gives a false image, therefore the additional open space is built in to the text of individual planting prescriptions. The other addition of open space is to allow the Forester delivering the replanting programme, to sculpt boundaries of planting edges, to create a less rigid forest structure and reduce the risk of hard edges on the landscape. Within the plan there is no active prescription for lowering planting lines, though reduction away from boundaries is preferable to allow for more secure fence lines and the potentially for natural regeneration of shrubby broadleaves above the productive crop.

The non-productive woodland elements of this replanting plan have been designed to afford a more natural transition, stronger riparian corridors and species choice is determined by the use mainly of pioneering species and species that fruit prolifically. By using tree species that produce fruiting bodies in great number, encourages both avian and mammalian browsers who will in turn spread the seed further than can be achieved by wind. The intention is that in future a more viable seed source of native species will be available to produce more robust natural regeneration. The riparian corridors described in this plan are intended to be delivered with areas of integral open space and less formal planting, thus mimicking natural colonisation and allowing suitable dappled habitat for fish spawning and development yet more open areas for water vole.

5.3 Management of open land

There are relatively few large areas of integral open land within the forested area, the open land is largely confined to the upper extremes above the natural tree line. Access to these

areas is relatively poor but this plan and future iterations will seek to improve that and allow proactive management of these sensitive habitats. Where open ground is accessible, FLS undertakes management of non-native invasive species, only removing native species where it would be of positive effect to the habitat.

During the development of this plan, an area of deep peat bog has been identified in coupe 36021 which could give rise to an integral 15ha peatland restoration in the future. This area requires survey and the creation of a business plan in order to create a sustainable plan for restoration which will go ahead once the coupe is felled. The felling period indicated for the coupe is phase 6, in line with the previous plan; this will be reviewed at the next plan renewal.

5.4 Visitor zones and access

Access to this plan area is granted under the Scottish Outdoor Access Code (SOAC). The High Corrie Trail from the Old Drymen Road car park and the Rob Roy Way follow forest roads on the eastern boundary. There is an old right of way along the Bruach Caorainn Burn on part of the northern Boundary. New waymarked cycle routes, developed in association with Gravelfoyle, briefly come into the block at Blairvaich. See section 8.6.1 for more detail.

5.5 Deer management

Deer management in this area is undertaken by both FLS and contract and outlined in a plan covering the wider Loch Ard forest. Over the previous period management has been relatively intense and this has reduced numbers, though with access to neighbouring ground and the vast forested area of the Loch Ard basin, deer numbers are still not low enough to see natural regeneration without fenced enclosures.

The cull targets are monitored and adjusted based upon a collection of annual surveys. As areas of forest are cleared, as part of normal forest management and renewal, more strategic access routes are being incorporated to allow easier access on to open hill ground, to further the ability to control deer populations to a healthy and sustainable level.

5.6 Other proposals

FLS will normally seek to map and identify all planned tree felling in advance through the LMP process. However, there are some circumstances requiring small scale tree felling where this may not be possible and where it may be impractical to apply for a separate felling permission due to the risks or impacts of delaying the felling. Felling permission is therefore sought for the LMP approval period to cover the following circumstances:

- Individual trees, rows of trees or small groups of trees that are impacting on important infrastructure (as defined below*), either because they are now encroaching on or have been destabilised or made unsafe by wind, physical damage, or impeded drainage.

*Infrastructure includes forest roads, footpaths, access (vehicle, cycle, horse walking) routes, buildings, utilities and services, and drains.

The maximum volume of felling in exceptional circumstances covered by this approval is 75 cubic metres per Land Management Plan per calendar year.

A record of the volume felled in this way will be maintained and will be considered during the five year Land Management Plan review.

5.7 Restructuring

5.7.1 Summary

The felling proposals continue the process of restructuring the forest developed in previous plans. The aim of restructuring is to gradually convert a largely even aged, single species woodland into one with a more balanced age structure and a more diverse species range. It is believed that a more diverse forest will be more resilient to both disease and damage from extreme climatic events. Creating a coupe structure where adjacent coupes are not felled and restocked within five to fifteen years of each other is a standard method of achieving diversity. So called "adjacency" issues have been avoided as far as possible. The retention of several stands beyond the age of 60 years will afford improved age structure and resilience in the medium to long term. Permanent woodland and a mix of open ground and natural regeneration along riparian zones both within and outside the FHN will further improve resilience.

5.7.2 Species diversity

Table 5.1 and Figure 5.1 indicate the change in relative species composition between 2021 and 2051. There is a reduction in the amount of Sitka spruce relative to other species over the 30 year period, but it remains the dominant species. The amount of larch is reduced as a response to the threat of P.Ramorum disease. Diversity is maintained due to the significant increase in native broadleaves. As the areas of "other broadleaves" have not been surveyed for exact species content, these are not included in native broadleaves, however there is no active non-native broadleaf programme present within the plan area.

Species	2021	2031	2041	2051
Sitka spruce	49.9%	45.8%	42.1%	37.1%
Larches	1.8%	1.2%	1.2%	1.0%
Western hemlock	0.1%	0.00%	0.00%	0.00%
Scots pine	1.4%	1.6%	1.5%	1.5%
Other Conifer	8.8%	8.0%	6.6%	6.1%
Alder	0.1%	0.1%	0.1%	0.01%
Native broadleaves	3.3%	5.7%	7.0%	10.9%
Other broadleaves	1.1%	1.1%	1.1%	1.1%
Open	33.5%	36.5%	40.4%	42.3%
	100.0%	100.0%	100.0%	100.0%

Table 5.1 Change in species diversity over time (percent woodland area)

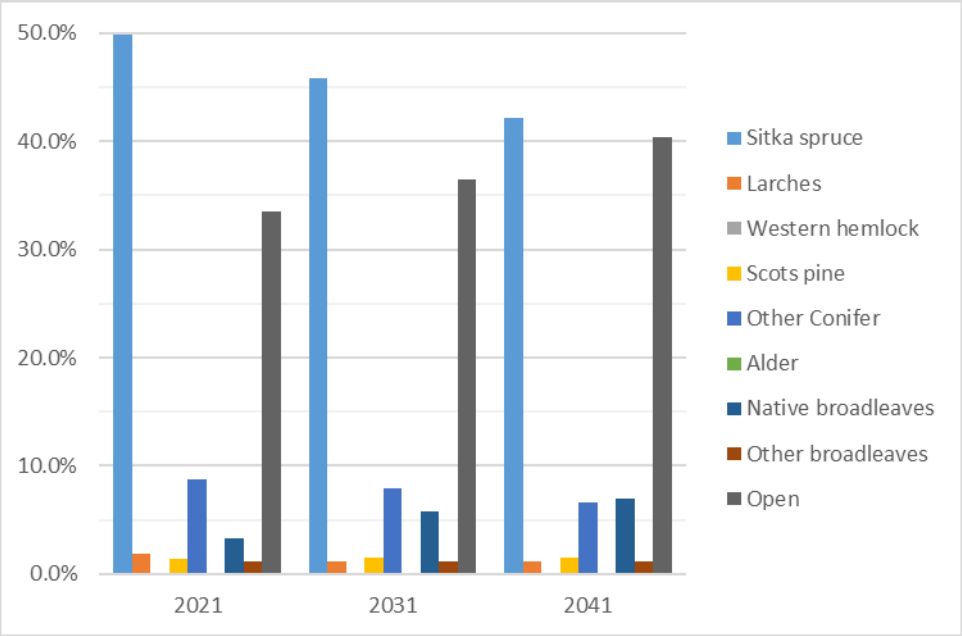

Figure 5.1 Change in species diversity over time (percent woodland area)

5.7.3 Age structure

Table 5.2 and Figure 5.2 show the change in relative age structure between 2021 and 2051. These figures indicate that it will take some time to achieve a balanced age structure. There is an increase in older aged stands, which drops significantly after 2041, this is due to a lack of diversity and the need to hold many coupes beyond their optimum age in order to manage water run off issues gradually.

Age Class	2021	2031	2041	2051
0-10	11.5	14.0	20.9	26.6
11-20	17.0	12.0	14.3	21.4
21-40	23.2	31.2	31.1	28.0
41-60	40.7	29.5	16.5	19.2
60+	7.5	13.3	17.3	4.8

Table 5.2 Change in age structure over time (by percentage)

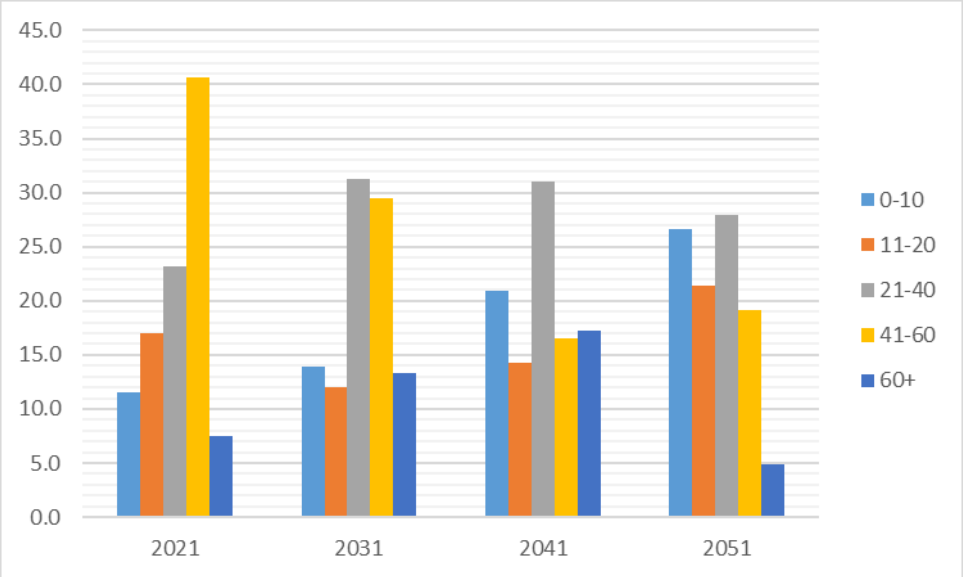

Figure 5.2 Change in age structure over time (by percentage)

6.0 Critical success factors

- Funding must be obtained for road bridges as Corriegrennan (temporary) and Glean Meadhonach (permanent).
- A combination of strategic deer management and some deer fencing are required to ensure broadleaf riparian zones establish.
- Close attention must be paid to changes to the plan, to ensure best practice is followed for both flood mitigation and avoiding exacerbating the potential for waterbody acidification.
- In order to establish effective bog restoration, survey data must be gathered and business planning must be in place as well as a future monitoring programme to remove natural regeneration of trees species.

7.0 Management prescriptions

Clearfelling is the dominant management system that will be used. Coupe design takes into account topography, landscape and operational constraints and is intended to facilitate future restructuring. Several coupes on steep ground present severe difficulties and detailed workplans will be drawn up prior to work commencing. Age of clearfelling will generally be in the range 40 to 60 years.

Some younger stands will be assessed for thinning during the plan period to determine the feasibility of doing the work and the most suitable methodology. Thinning will normally be

carried out at, or below, the level of marginal thinning intensity (i.e. removing no more than 70% of the maximum MAI, or YC, per year). Higher intensities (no more than 140 % of maximum MAI, or YC, per year) may be applied where thinning has been delayed, larger tree sizes are being sought or as part of a LISS prescription. In all cases work plans will define the detailed thinning prescription before work is carried out and operations will be monitored by checking pre and post thinning basal areas for the key crop components. A rack system will be established with racks at appropriate intervals, any outstanding volume being taken from the matrix. The potential to continue thinning into the future will be assessed on a stand by stand basis. A more selective approach to thinning some mature stands will be considered.

Restocking for productive purposes will be by planting following any necessary site preparation. The latter will include brash management, drainage and, in general, mounding to provide a sheltered weed free planting site. On steep ground flat planting might be necessary. Fallow periods will be used to help mitigate weevil damage in line with aspirations to minimise use of chemical deterrents. Softer species may be protected by fencing from animal browsing.

8.0 Background information

8.1 Previous plan

8.1.1 History

This is the first version of the West Loch Ard Land Management Plan, previously being the two adjacent plans areas of Corrie and Corriegrennan. The forest area is relatively young consisting of a mixture of 1st and 2nd rotation stands, mainly comprising Sitka Spruce and Lodgepole Pine planted in the 1950's & 60's. Traditionally an open habitat prior to commercial plantation, there are very few examples of Ancient Woodland or PAWS to be found.

8.1.2 Analysis of previous plan

The previous plan sought to secure both a future of productive softwood forestry in the area whilst expanding riparian networks. Plans to establish broadleaf woodland have largely proven to be too ambitious.

The 2 previous plans which make up West Loch Ard sought permission for the felling of 9 coupes between them, all bar one of the approved felling coupes was achieved. In Corriegrennan 36014 was a large coupe placed high on the slopes of Beinn Uird consisting of Sitka Spruce and Lodgepole pine. Access was poor to this area, especially the Lodgepole pine, during detailed work planning a decision was made to leave the large compartment of Pine due to the access issues and significant areas of soft ground. Harvesting the pine it is felt would have caused significant damage to the ground conditions, potentially exacerbating water issues in the area. In order to address landscape sensitivity over the hard boundaries created by the original planting, scalloping was undertaken where machinery could access along firmer

ground, breaking up the solid crop and opening the potential for shrubby broadleaf species to re-establish along riparian corridors and the upper edge.

Water acidity was not regarded as an issue at the previous plan submissions in 2007 and 2010, this is reflected in the size of felling coupes being large and not in line with current best practice.

8.1.3 Continuity with revised plan

This revised plan largely mirrors the efforts of the previous plan, productive forestry continues to the main objective. Having reviewed some of the efforts of the previous plan, lessons have been learned and actions improved upon to ensure greater success in the future. The water quality of Duchray water catchment remains a prime objective within the plan, however where the previous plan described large areas of Oak along the FHN established by natural regeneration, this has been revised to showing planting of primary broadleaf species to ensure the highest rate of initial success; the tertiary species such as Oak can either be introduce at a future iteration of the plan via under-planting or potentially natural regeneration, once ground conditions are more suited.

8.2 Physical site factors

8.2.1 Geology, soils and landform

The soil structure within this plan area is largely quite complex with small pockets of differing structures affected by the underlying geology; regarded as being formed by tectonic movements. The plan area sits astride the Highland Boundary Fault and this substructure creates pockets of deep and shallow soils as well as raised bogs. The general trend is toward more wet and indurated soils, this can be partially attributed to the location on the northeast facing side of the Ben Lomond range. The soils vary in balance but revolve around the 3 main groups of peaty surface water gley, intergrade ironpan and Molina bog. This complex nature does mean that in some areas establishing viable woodland for the purposes of timber production has proven challenging and water levels in some areas will need to be managed more effectively in future if productive forestry is to remain the main aim of the land management as rooting depth can be severely compromised.

As previously described the plan area varies from the Duchray Water at an elevation of approximately 60m AMSL through to the peak of Guallan at 460m AMSL and the shoulders of Beinn Uird at 400m (Beinn Uird summit is 597m). Though some of the slopes can be steep it is in general a fairly rolling landscape, the gradients being less to the south and greater to the north of the plan area. Landscape character is further described in section 8.5 of this plan.

8.2.2 Water

As previously described the main drainage area of this land management plan is in to the Duchray Water with the remainder flowing in to the Kelty Water (see Map M7), both of which flow in the Forth and are described in the SEPA Trossachs Flood Management Plan (PVA

09/01). The PVA clearly identifies that there is a historic issue with flooding in the area and there is a need to establish protection measures both at a structural and land asset level. This plan aims to follow the current best practice on reducing flood risk at a land asset level, where suitable opportunities will be undertaken to build on efforts to slow the flow of surface water in to the river basin system downstream in the East Loch Ard plan area. All forestry work is undertaken to be compliant with the latest Forest and Water Guidelines.

This plan revision brings improvements over the previous iteration in terms of flood mitigation. If the management structure had remained as a continuation of the previous plan, the potential would have been that over 9% of the Duchray Catchment might have been felled as part of standard forestry operations during the next 10 years, when combined with the other relevant LMP's. With this iteration that has been reduced to just 6% of the entire catchment, keeping well within the 20% recommended under best practice guidelines.

The Duchray Water is also classified as a failing water body for reasons of acidity, an issue not commonly found in Scotland outside Galloway. In the development of this plan, expert opinion and guidance has been sought from SEPA, Forest Research, Scottish Forestry and the FLS national support team. SEPA believe that much of the acidity comes from the underlying geology and that forestry factors although relevant, do not play a key part in this issue and further research is required. In line with the recommendations received this plan has been developed against the best practice guidance for 'managing forest in acid sensitive water catchments (2014)'

8.2.3 Climate

In the preparation of this plan the Ecological Site Classification has been used to determine suitability for tree species when matched against the target objectives, for most conifer productive species the key limiting factor, according to ESC, is the soil nutrient regime, often regarded as "very poor 3"

Thanks to the Lomond range which divides the watershed from Loch Lomond, the plan area is relatively sheltered with over 50% of the plan described as "sheltered rising to moderately exposed", "high exposure" is only relevant to the smallest upper margin above the tree line. The other impact of being sheltered by the Lomond range is the climate impact with moisture being relatively high and temperature low.

8.2.4 Future climate

Predicting the impact of future climate change presents one of the biggest challenges in forest planning. Analysis carried out by Forest Research indicates an overall increase in average temperatures with warmer summers and milder winters. There will be regional variation in the future rainfall pattern and distribution, with a predicted decrease in summer rainfall in the east but a predicted increase in the west of the country. This will lead to more frequent drought in the east but a reduction in moisture deficit in the west.

There is less confidence in predicting changes in other climatic parameters such as windiness and extreme winter cold or summer heat. However, there is a general belief that the number of frost days will decrease and that the incidence and severity of extreme events (e.g. gales and heavy rain) will increase.

Data for the plan area suggest an increase in accumulated temperature of over 50% by 2050, compared to baseline 1960 – 1990 data, and about 75% by 2080. Relative increase is even greater at higher elevations and all parts of the forest are predicted to be classed as warm as early as 2050. Annual rainfall is predicted to remain more or less the same, a decrease in summer rainfall being compensated by a similar increase in winter. Despite the decrease in summer rainfall moisture deficit is predicted to also decrease. The impact of these changes on soil properties is uncertain. Potentially there could be an increase in growth rate in all tree species and a wider range of species may become suitable. However where exposure is currently a limiting factor it seems likely to remain so, and this potential for increased growth rate will be restricted to more sheltered parts of the forest.

8.3 Biodiversity and environmental designations

A map of the local conservation and heritage features can be found on Map M6.

There are no designations located within the plan area, however the Ben Lomond SSSI sits adjacent to the very north of the plan area, sharing a border for nearly 1.5km. Additionally there are no known Schedule 1 Species located within the plan although given the location, it is expected that colonisation will occur in time. The area does have an active water vole management plan in place to help improve conditions, reduce predators and provide opportunities for population growth.

The water catchment for the plan area is split between the Duchray and Kelty Water's which both flow in to the River Forth. The Duchray Water is described by SEPA as a failing catchment due to excess acidity levels. The exact cause of the increased levels is not known but believed to be due to underlying geology more than forestry practices. As conifer woodlands are being managed through their productive life cycle, a broad Forest Habitat Network (FHN) is being established along the Duchray and its major tributaries.

Adjacent to the Little Bruach settlement is the only area of PAWS within the plan, this is currently being actively restored with native broadleaf planting directed under the previous plan. There is also an area of ASNW located near to Blairviach cottage, this is an established Oak Woodland and forms part of the Natural Reserves maintained by FLS.

8.4 The existing forest

8.4.1 Species, age structure and yield class

Loch Ard in general has long been a large expanse of productive forestry and West Loch Ard a significant part of that, with the overwhelming majority of trees being Sitka Spruce as can be

seen in Table 8.4.1. Due to climatic conditions being damp and cool, alternative tree species offer relatively poor growth and suitability. At the highest elevations Lodgepole Pine has been the favoured species, though this has still produced very low yield and grade timber.

Species	Area (ha)	Area (%)
Sitka spruce	1040.9	43.4
Larches	38.6	1.6
Western hemlock	1.1	0.05
Scots pine	29.4	1.2
Other Conifer	183.1	7.6
Alder	1.7	0.1
Native broadleaves	69.6	2.9
Other broadleaves	23.3	1.0
Open	1012.3	42.2
	2400	100.0

Table 8.4.1 Species diversity, West Loch Ard 2021

Having previously 2 different plan areas, Corrie and Corriegrennan, there is a marked difference between the age diversity. Corrie to the south is generally flatter and more well roaded, this has led to the area being well worked and the age structure quite young. In contrast the northern area (Corriegrennan) has steeper slopes and more complex terrain, resulting in an even aged monoculture of Sitka spruce. With 40% of the plan area forested in trees aged 41-60 years of age, much of the standing timber is at maturity and in need of being felled in order to maintain the best financial return, though this must be balanced with ecological needs such as protection of the Duchray Water.

Age	Area (ha)	Area (%)
0-10	160	11.5
11-20	236	17.0
21-40	322	23.2
41-60	565	40.7
60+	104	7.5
	1388	100.0

Table 8.4.2 Age diversity, West Loch Ard 2021

8.4.2 Access

There are numerous ways for vehicle traffic to enter the plan area from neighbouring plan areas managed by FLS, though routes through the plan area are largely linear. The Loch Ard area is well served by the timber haulage route which runs from Loch Chon in the north to the

Hoish transfer point in the south and is commonly served by the low ground impact road haulage train. Most other access points in to the Loch Ard forest area are designated to light vehicles only. A roads and access map is shown in the supporting document section of this plan, Map M5.

8.5 Landscape and land use

8.5.1 Visibility, landscape character and value

At lower levels the plan area is not visible, this is due to being surrounded by East Loch Ard, Greenburn, and Beinn Bhan with high ground behind. The first impression that the plan area has on the landscape is from the viewing area at The Lodge above Aberfoyle or those who are more adventurous will get an increased view from the peak of Craigmore directly beside The Lodge. From Aberfoyle the plan area is relatively remote (8-12km away) forming a thin tree line on the horizon to the south west below the summits of Gualaan, Beinn Uird and Binnean nan Gobhar. As the route to the summit of Craigmore is promoted by the National Park Authority and quite popular, it is regarded as one of the landscape viewpoints (Appendix iii). The other significant viewpoint of the plan area is afforded from the tourist route to/from the summit of Ben Lomond. From the very summit the plan area is not particular visible due to the eastern end of the Coire a Bhathaich, however when descending from the summit the majority of the plan area is visible as the viewer looks along the Forth Valley (approx. 865m AMSL) before a switchback turns the walker away and diverts the attention to the Lomond Valley.

The previous iteration of the plan has often cut across the landscape with the coupe design, this plan has sought to revise that where possible and use more sympathetic lines that run with the ridges of the Highland Boundary fault.

8.4.2 Neighbouring land use

The neighbouring land to West Loch Ard is split in 2 distinct directions, to the northwest, northeast and southeast is high production forestry under the management of Forestry and Land Scotland, comprising mainly of Spruce but with elements of native woodlands, especially around the key water courses. To the Southwest the land rises to higher elevations than the forest and takes in the open moorland, ranging from the plateau of Moorpark in the south through the increasing peaks of Gualann, Beinn Bhreac & Beinn Uird before the land climbs to the summit of Ben Lomond in the north. At the upper elevations there is limited sheep grazing the land is mainly wild and open to ground nesting birds and herds of deer. There is little evidence of recreation in this open hill area until the lower shoulders of Ben Lomond where there is the tourist path from Rowardennan to the summit.

8.6 Social factors

8.6.1 Recreation

The High Corrie Trail from the Old Drymen Road car park and the Rob Roy Way follow forest roads on the eastern boundary. There is an old right of way along the Bruach Caorainn Burn on

part of the northern boundary. New waymarked cycle routes, developed in association with Gravelfoyle, briefly come into the block at Blairvaich. Apart from these more formal trails, access to the remainder of West Loch Ard plan area is granted under the Scottish Outdoor Access Code (SOAC) and visitors are free to explore as long as they take into account their own, and other forest users' safety.

8.6.2 Community

West Loch Ard falls within the area covered by the Strathard Initiative and the Strathard Framework. Although more remote from the main centres than other parts of Loch Ard Forest there remains community interest in several aspects of the plan area. For example local history groups are keen to draw attention to the ruins of the settlement at Little Bruach Caorainn.

8.6.3 Heritage

Within the plan area are several heritage features such as steadings and enclosures, representative of the prior land use. Known heritage features located within the plan area can be found on Map M6. The most significant of these heritage features is the settlement at Little Bruach Caorainn, discovered during harvesting operations in the previous plan period. The small settlement has been researched and recorded by FLS staff and has featured in several publications. The area is being actively managed to allow for curated decay and unnecessary disturbance will be avoided. The surrounding area will be restored to native woodland in the future.

Appendix I: Consultation record

Consultee	Date contacted	Date response received	Issue raised	Forestry and Land Scotland Response
Scottish Forestry	30/01/2020	None received		
Loch Lomond and Trossachs National Park	30/01/2020	12/02/2020	* Modification to the harsh transition between the forest and unforested upper land should be implemented, these opportunities should include creating an improved landscape fit of the productive conifer restocking, the establishment of low density native woodland which would both provide benefits for black grouse along with reducing the risk of non-native conifers seed establishment on the unforested upper land. * There are areas on the unforested upper land which have established spruce regeneration , some of which is on deep peat and as such should be removed as a priority, followed by spruce outwith productive area including open ground prior to it reaching coning age. * Notwithstanding the dominant objective of productive conifer production the LMP area should include a FHN which connects the unforested upper land to riparian areas and other habitats. This FHN should also link with adjacent LMP FHNs as well. * There should be sufficient deer management to enable appropriate species choice based soils and altitude as there should be establishment of diverse conifer and broadleaves along with the Sitka spruce. Any landscape scale issues with deer management could be raised at the East Loch Lomond land management forum to enable a collaborative approach to be agreed. * The restocking of any areas of poorly growing conifer due to deep peat should be considered against the guidance regarding restocking on deep peat https://forestry.gov.scot/publications/1-deciding-future-management-options-for-afforested-deep-peatland/download * The design of any felling and restocking should be assess from a number of viewpoints it is suggested that these include Craigmore above Aberfoyle. * It is understood that there are proposed waymarked "gravel bike" routes which may overlap with the plan area.	It is accepted that previous forestry practices have often left forestry borders that appear hard in transition, modern forestry practice seeks to redress this. Included in each of the edge coupes is a larger than normal proportion of open space, this is to allow the development of scalloped edges. This cannot always be shown on the restock map to allow for varying site conditions, better understood once the exiting trees have been removed, however it is inferred in the text and integral to modern practices. Additionally by utilising pioneering broadleaf species which produce fruiting bodies attractive to wildlife, it is intended that native species will be spread further through transition/migration. Many of the upland open habitats within the plan have been and are largely inaccessible to effective regen removal. The planning of ATV routes now extend up to open hill edge, giving greater accessibility to staff and contractors to effect regen removal where it is detrimental to the habitat. The FHN design established under the previous plan has remained in place for this plan, the only changes have come from species and propagation choices. Through discussion within FLS it was agreed that pioneering species delivered through planting was the most effective way to ensure suitable FHN establishment. Deer management in this area is shared between FLS staff and a contract resource, indications show that management over the last plan period has been effective and FLS intend to build on that success over the next plan period. Some areas of unproductive ground have been identified within development of this plan, including an area of peatland currently forested. These areas have been identified within the restock proposals for a non-timber productive future. Work will now begin on developing a restoration plan for the area of peatland, where timber removals plans can be advanced and an effective management plan enacted. The viewpoints of significance have been explored in development of the plan, the result is the identification of Craigmore and decent of the Ben Lomond tourist path, as can be seen on Map M8. Due to the current travel restrictions it has not been possible to obtain up to date imagery from Ben Lomond however historic imagery has been used to provide visualisations. FLS Visitor Services have confirmed that there are no plans to established waymarked routes through the plan area this time.
CONFOR	30/01/2020	None received		

Consultee	Date contacted	Date response received	Issue raised	Forestry and Land Scotland Response
RSPB	30/01/2020	30/01/2020	None. A request was made to have a wider meeting with FLS to discuss more regional priorities.	A meeting has been set up to meet the request for a wider meeting at which it is hoped to receive some more plan specific feedback. (Postponed due to 2020/21 pandemic)
Scottish Water	30/01/2020	11/02/2020	There are important assets located within the proposed area and these assets will need to be protected accordingly. A site meeting is requested to discuss how we protect these assets and there is some work that needs to be undertaken by yourselves.	A site meeting with Scottish Water was held to discuss the access to coupe 36020, requiring new infrastructure for FLS to access timber safely. A concept was agreed in principle, with detail to be discussed closer to the felling date. The concept agreed upon is detailed within this plan.
SEPA	30/01/2020	31/01/2020	None. The email confirms SEPA no longer consult on non-specific issues and asks that LMP guidance follow UKFS and Forestry Commission best practice.	Following the original general scoping request, specific consultation with SEPA was made in regard to the Duchray Catchment and water acidity. The issue of water acidity was raised from FLS internal consultation, not by external parties. As directed by SEPA and Forest Research during specific consultation, FLS will follow best practice for "Managing Forests in Acid Sensitive Water Catchments" FCPG023.
SNH/Nature Scot	30/01/2020	11/02/2020	Original scoping response partially lost in FLS ERDM system error, replacement copy requested from Nature Scot 28/4/2021. Response originally received highlights the importance of the adjacent Ben Lomond SSSI and the requirement to control non-native coniferous spread.	The majority of the Ben Lomond SSSI borders the Beinn Bhan LMP, this plan therefore has limited effect on the SSSI itself, though more so on the adjacent land. As part of the previous plan the treeline adjacent to the SSSI was reduced from the boundary as part of a scalloping exercise and the adjacent Sitka Spruce removed. Under the previous plan allowance was made for ATV tracks that extend to the upper boundary, this improved access should allow for monitoring and periodic removal of non-native natural regeneration. Additionally the restocked tree line is slightly lowered from the previous one, allowing for increased separation from the SSSI, though tree species choice at this location and altitude is extremely limited and remains predominantly Sitka Spruce.
SSE	30/01/2020	None received		
Scottish Power	30/01/2020	None received		
Stirling District Council (Roads)	30/01/2020	None received		

Consultee	Date contacted	Date response received	Issue raised	Forestry and Land Scotland Response
Mountaineering Scotland	30/01/2020	05/03/2020	Although they are most likely accessed from the west side, public access may benefit from the creation of clear routes through the forest and through deer fencing to the two tops of Beinn Uird and Binnean nan Gobhar. Access may be promoted by forest paths being taken to the edge to allow access to the open hill and on either side, making the forest more permeable for informal recreation. Support for the potential to soften the forest edge facing Ben Lomond. It would be desirable to see the creating of a native broadleaf component alongside the main paths through the woodland for public enjoyment and for biodiversity benefits. This is now accepted practice for riparian habitats and we would wish to see it extended to recreational routes. The alternative is walking through a dense green corridor of commercial plantation until it is felled decades away.	At this time FLS have no plans to extend any existing waymarked routes in the West Loch Ard area, though access is granted under SOAC. Although not waymarked, members of the public are welcome to utilise ATV tracks created to assist in forest management, some of which do lead to the open hill. Due to regular illegal access into the Loch Ard forest area, FLS are not keen to establish clear signage which may encourage illegal users in to sensitive montane habitats. Over time the forest edge will be softened by the usage of modern forestry practice, scalloping of the conifer edge has already been undertaken in the area closest to Ben Lomond. In areas of high public usage, FLS is actively seeking to improve the visitor experience by varying woodland habitat and edge design. This is in line with modern forestry practice and an acceptance that "tunnelling" by conifers can be undesirable. Most FLS woodlands remain part of a portfolio of high production timber forests, due to the nature of forest management techniques there is always a requirement to bring sections of the productive woodland up to roadsides for operational access. As areas around footpaths are felled and restocked, softened edges will become more commonplace.
National Trust for Scotland	30/01/2020	03/02/2020	Acknowledgment of the request was received but no further input was given.	
Friends of Loch Lomond & The Trossachs	30/01/2020	03/02/2020	Acknowledgment of the request was received but no further input was given.	
Scottish Wild Land Group	30/01/2020	None received		
Forth District Salmon Fisheries Board	30/01/2020	None received		
Forth Rivers Trust	30/01/2020	None received		
CLEAR services Ltd. (Lepidoptera)	30/01/2020	None received		
BSBI Plant recorder	30/01/2020	16/02/2020	Confirmation of email was received and a request for further information on the area in question, including a shape file.	A shape file was supplied to the consultee but no further information was received.
Sustrans	30/01/2020	None received		
Strathard Community Council	30/01/2020	03/02/2020	Acknowledged and request to be kept informed.	Updates placed on FLS web pages; closer consultation confounded by Covid pandemic. Draft text provided to SCC and revisions made following a meeting in July 2021.
Gartmore Community Council	30/01/2020	None received		
Raptor Study Group	30/01/2020	None received		
Buchanan Castle Estate	30/01/2020	None received		

Appendix II. Scoping record

West Loch Ard Land Management Plan

Record of scoping exercise carried out by email in February 2020

A number of stakeholders were contacted by email in February 2020 and the responses received are summarised in Appendix I.

NB: All forests managed by FLS are certified under the UK Woodland Assurance Scheme (UKWAS), which requires forests to be managed sustainably. The UKWAS is part of the Forest Stewardship Council (FSC) scheme, which allows timber sourced from certified forests to carry the FSC label.

Appendix III. Table of operations

Coupe	Operation	Species	Gross Area (ha)	Net Area (ha)	Fell Year	Volume (m3)
33020	n/a	n/a	n/a	n/a	n/a	n/a
33003	Clearfell	SS/WH/LP	9.8	7.3	2022	4474
33052	Clearfell	SS	1.1	1.1	2023	302
36018	Clearfell	SS	39.9	33.3	2023	18503
33007	Clearfell	SS/SP/LP/JL	8.6	4.6	2024	1896
33111	Clearfell	SS/SP/NS/JL/LP	10	6.7	2024	2984
36001	Clearfell	SS/JL	30.5	23	2024	12203
36020	Clearfell	SS/JL	49	36.4	2027	22396
36029	Clearfell	SS	35.2	25	2027	13338
33008	Clearfell	SS	12.3	11.9	2028	6417
33022	Clearfell	SS/LP	28.6	21.9	2028	9369
33035	Clearfell	SS/HL	14.2	12.9	2028	4489

Operation	Propagation	Species 1	Area (ha)	Species 2	Area (ha)	Species 3	Area (ha)	Species 4	Area (ha)	Restock Year	Open Space	Gross Area (ha)	Comments
Restock	Planted	SS	10.6	MB	4.3					2022	6.4	21.3	Felled 2020
Restock	Planted	SS	8.8	MB	1.0					2025	0.0	9.8	
Restock	Planted	BI	0.3	MB	0.2					2025	0.6	1.1	Riparian woodland
Restock	Planted	SS	18.5	BI	3.8	ROW	5.6	MB	5.8	2025	6.2	39.9	Potentially to be some areas of wet woodland at restock
Restock	Planted	SS	6.1	MB	1.5					2027	1.0	8.6	
Restock	Planted	SP	5.0	MB	3.0					2026	2.0	10.0	Riparian woodland adjacent to south tunnel
Restock	Planted	SS	5.9	NS	3.4	BI	3.1	MB	7.3	2026	10.8	30.5	OS includes unplanted rocky outcrops & deep peat
Restock	Planted	SS	6.1	NS	3.7	SP	2.4	MB	21.3	2029	15.5	49.0	Area between Duchray and Water Tunnel to be non-productive in future, due to poor access
Restock	Planted	SS	12.7	BI	4.5	ROW	5.9	MB	3.9	2029	8.2	35.2	Use fruiting & pioneer broadleaves
Restock	Planted	SS	9.8	MB	1.2					2030	1.3	12.3	Part of 33022 & 33035
Restock	Planted	SS	7.4	MB	0.6					2030	20.6	28.6	Existing crop poor quality, plantable area reduced
Restock	Planted	SS	14.2							2030	0.0	14.2	Part of 33022 & 33035

Gross Felling Area (ha) **239.2**
Net Felling Area (ha) **184.1**
Volume (ha) **96371**

Net Restock (ha) **187.9**
Open Space (ha) **72.6**
Gross Restock (ha) **260.5**