

## Central Region Cruach Benmore Strategic Larch Removal 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.



The mark of  
responsible forestry





## FORESTRY AND LAND SCOTLAND

### Application for Land Management Plan Approval


#### Forestry and Land Scotland - Property

Region:	Central
Woodland or property name:	Cruach Benmore
Nearest town, village or locality:	Kilmun
OS Grid reference:	NS 163 839
Local Authority district/unitary Authority:	Loch Lomond and Trossachs National Park

#### Areas for approval

	Conifer	Broadleaf
Clearfelling	253.3ha	5.4ha
Thinning	40.2ha	0ha
Restocking	275.8ha	14.0ha
New planting (complete appendix 4)	0.0ha	0.0ha

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 terms of the Forestry (Environmental Impact Assessment) (Scotland) Regulations 2017 for roads, tracks and quarries as detailed in my application.
3. I confirm that the initial scoping of the plan was carried out with FLS staff on 23<sup>rd</sup> February 2021.
4. I confirm that the proposals contained in this plan comply with the UK Forestry Standard.
5. I confirm that stakeholders have been advised of the departure from our normal consultation process, with their comments being invited as part of the "public register" stage. Any relevant issues highlighted during this stage (and agreed with Scottish Forestry) will be incorporated into the plan. These comments, and the FLS response, will be recorded in the consultation record.
6. I undertake to obtain any permissions necessary for the implementation of the approved Plan.



Signed .....  
Regional Manager

Signed.....  
Conservator

Region Central

Conservancy.....

Date 9/9/21

**Date of Approval**.....

**Date approval ends** .....



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## 1.0 Summary

### 1.1 Introduction

The purpose of this forest plan is to address the significant spread of the tree disease *Phytophthora ramorum* affecting Larch spp. across woodlands of Cruach Benmore on the Cowal Peninsula (*Map M01*).

Forestry and Land Scotland (*FLS*) has seen a significant increase in the spread of *P. ramorum* in 2020, with a subsequent increase of *Statutory Plant Health Notices (SPHN)* served on the Cruach Benmore plan area. It is expected that this will continue in 2021 and beyond until all Larch is infected, providing a significant source for the pathogen to reproduce from (current Larch distribution and SPHNs served are shown on *Map M02*). A full current species map can be seen in *Map M03*.

Approval is sought for a 5 year approval only. The aim of creating this 5 year *Strategic Larch Removal Plan* is to establish the relevant approvals and a programme of work to remove all Larch spp. from Cruach Benmore over the next 5 year period. A number of clearfell coupes have been identified, alongside priority thinnings, to accommodate this while leaving the remaining forest resilient and windfirm. This will allow FLS to respond to infections more quickly and in an organised and timely manner, with the intention of slowing the spread of the disease. It will minimise the need for amendments to 10 year Land Management Plans (*LMP*) which are frequently required when SPHNs are served, thus preserving the integrity of this plan during its lifetime. It should be noted that any future SPHNs will still be prioritised and felled within the SPHN timescale.

Although this Strategic Larch Removal Plan covers a shorter period, it addresses the issues that would be described in a typical 10 year Land Management Plan. Restocking largely follows that described in the previous plan. A new, full 10 year plan for Cruach Benmore will be produced within 5 years.

### 1.2 Objectives

- Address the current and anticipated SPHNs in the Cruach Benmore plan area
- Limit the spread of *Phytophthora ramorum* in the wider geographical context by felling the majority of Larch spp. in the Cruach Benmore plan area
- Create a proactive felling plan that gives the public and stakeholders an honest and up-front indication of our proposals that would otherwise be delivered via SPHNs and amendments

- Provide Scottish Forestry with a robust 5-year management plan for Cruach Benmore that minimises the need for individual amendments associated with SPHNs
- Resilience felling to reduce future threat to neighbouring properties in Kilmun from windblow
- Maintain Continuous Cover Forestry (CCF) management by targeted felling of Larch spp. where appropriate
- Introduce greater species diversity at restocking, providing future structural diversity

## 1.3 Key proposals

<b>Total Plan Area</b>	1660ha
<b>Planned operations</b>	
Felling	258.7ha; 118915m <sup>3</sup>
Thinning	40.2ha; 11821m <sup>3</sup>
Restock	275.8ha of conifer; 14.0ha of broadleaf.
New planting	0ha
Roads and tracks	660m forwarder track
Public access	n/a

Table 1 – Key proposals

## 2.0 Scottish Forestry Regulatory Requirements

### 2.1 Summary of planned operations

The operations proposed in this plan focus on the removal of Larch spp. from the plan area. This section describes in summary the operations FLS intend to undertake over the next 5 years in order to achieve this. Some of the operations described are already approved under amendment from Scottish Forestry; for the purposes of transparency and to provide a whole picture, all operations are described in this plan.

A summary of planned operations is outlined in *Table 1* above; a fuller description and rationale for the proposed works can be found in *Section 5* of this plan; a detailed table of operations can be found in *Appendix II*.

### 2.2 Proposed felling in years 2021- 2025

A number of coupes in this plan area already have approval until June/July 2022 for felling via standalone *Felling Permissions*, which were requested in June 2021 to allow work to continue while this plan was still in development.



This is summarised in *Table 2* below; specific coupes are identified in the *Table of Operations (Appendix II)*.

<b>Felling Operation</b>	<b>Area (ha)</b>	<b>Approx. Volume (m<sup>3</sup>)</b>
Clearfell (pre-approved by amendment)	122.3	60679
Clearfell (requiring approval)	136.4	58236
Thinning (pre-approved by amendment)	3.5	1664
Thinning (requiring approval)	36.7	10157
<b>Total</b>	<b>298.9</b>	<b>130,736</b>

*Table 2 - summary of pre-approved and proposed operations*

*Table 3* below outlines all species to be felled. A significant volume of other species in addition to Larch spp. will have to be felled; this is due to the widespread occurrence of Larch spp. in mixed stands, the need to fell to windfirm edges for future resilience of the wider forest, and the need to design viable coupe shapes for operational and financial practicalities.

<b>Species</b>	<b>Area (ha)</b>	<b>Approx. Volume (m<sup>3</sup>)</b>
<b>Larch spp. (all)</b>	80.5	31282
<b>Pine spp. (all)</b>	14.3	5803
<b>Sitka spruce</b>	141.6	70549
<b>Norway spruce</b>	5.4	3634
<b>Douglas fir</b>	6.4	3954
<b>Western Hemlock</b>	1.4	1201
<b>Other conifers</b>	3.8	1557
<b>Mixed broadleaves</b>	5.4	935

*Table 3 - Species to be clearfelled by area and volume*

This will have an effect on the age structure of the forest in the short to medium term. As can be seen in *Table 4* and *Figure 1*, there will be a considerable reduction in area of trees in age class 21-40 years, and this is almost matched by an increase in young stands in age class 0-10 years.

<b>Age Class (years)</b>	<b>Area % 2022</b>	<b>Area % 2027</b>
0-10	9	28
11-20	4	7
21-40	43	27
41-60	18	18
60+	26	20

Table 4 – Age structure of forest as percentage of woodland area

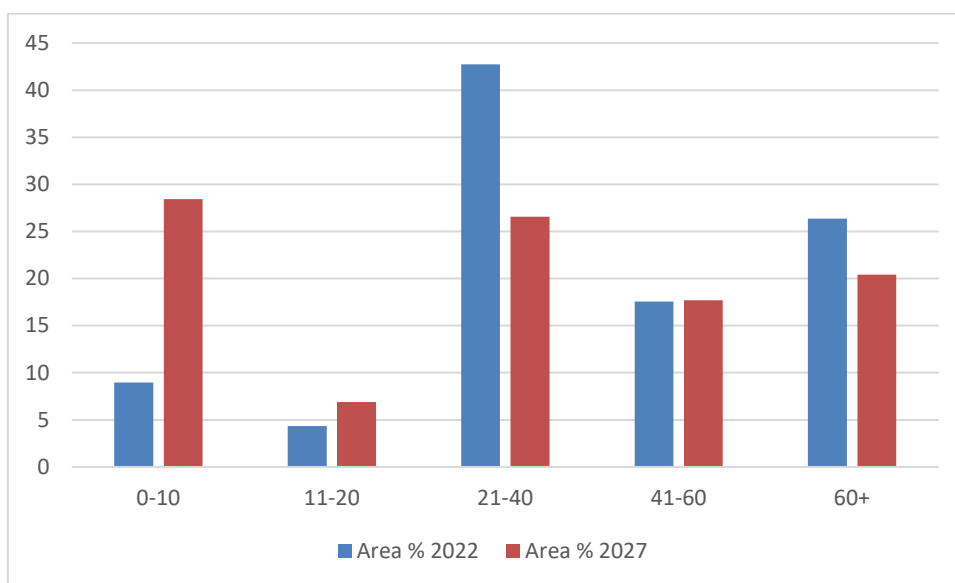


Figure 1 – Age structure of forest (as per Table 4 above)

Map M04 shows the coupes proposed for this plan period. This involves clearfelling and selective removal of Larch spp. in thinning coupes. This map also illustrates the context of Larch spp. distribution across the plan area. Felling includes a small area of *resilience felling* in coupe 10030, above Kilmun, intended to protect neighbouring properties from the threat of future windblow events. Map M02 gives further context with detail of current Larch spp. distribution and of SPHNs issued as at August 2021.

## 2.3 Proposed thinning in years 2021-2025

<b>Species</b>	<b>Area (ha)</b>	<b>Approx. Volume (m<sup>3</sup>)</b>
<b>Larch (all)</b>	13.6	5876
<b>Other conifers</b>	26.6	5945

Table 5 – Summary of thinning proposals

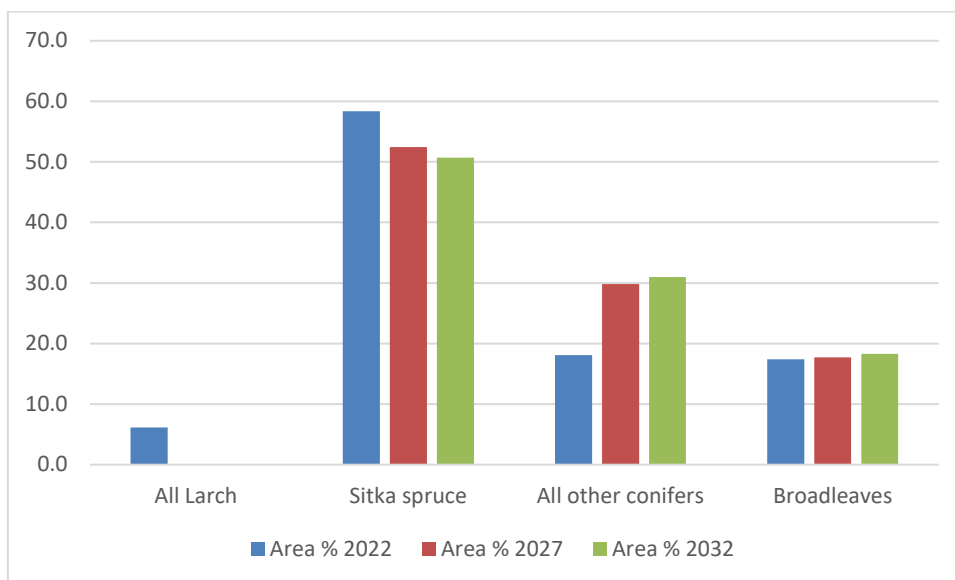
Indicative thinning areas are shown on *Map M04* and summarised in *Table 5* above. The majority of this work is selective removal and extraction of Larch spp. from mixed stands on the lower slopes between Inverchapel and Kilmun, and is comparable to CCF management techniques of single and group selection. The totals also include the removal of Western Hemlock from coupes 10041 and 10143; this is to remove an invasive seeding source in CCF areas. *Section 5* below gives a fuller description of the proposed thinning work.

## 2.4 Proposed restocking in years 2021-2025

For the purpose of this *Strategic Larch Removal Plan*, restocking proposals remain largely those of the previous plan, with the main exception of Larch spp. which will be replaced by suitable alternative conifers and broadleaves. The effect this will have on future species composition can be seen in *Table 6* and *Figure 2* below.

Species	Area % 2022	Area % 2027	Area % 2032
<b>All Larch</b>	6.1	0.0	0.0
<b>Sitka spruce</b>	58.4	52.5	50.7
<b>All other conifers</b>	18.1	29.8	31.0
<b>Broadleaves</b>	17.4	17.7	18.3

*Table 6 – Change in species diversity over time as a percentage of woodland area (excludes areas of open space)*



*Figure 2 – Change in species diversity over time (as per Table 5 above)*

Restocking across the whole plan area will be fully reviewed when the next full 10 year plan is produced to replace this *Strategic Larch Removal Plan*. The outline plan for restocking of the clearfell coupes proposed in this plan is illustrated on *Map M05*, and detailed on a coupe by coupe basis in the

Table of Operations (*Appendix II*). Two additional coupes have been felled and await restocking, coupes 10044 and 10055, totalling 14.5ha conifer and 5.5ha broadleaves.

Restocking will take place up to 3 planting seasons after felling. Please note that due to the shorter period proposed for this *Strategic Larch Felling Plan*, and the extended harvesting time caused by steep terrain and environmental constraints, the majority of restocking will take outwith this plan period. The totals quoted in the tables above reflect all restocking of these coupes, not just that confined to this 5-year period. Conifer restocking density will be to 2500 stems per ha and broadleaves to 1600 stems per ha.

The southern part of the proposed *resilience felling* (coupe 10030), as shown on *Map M04*, will clearfell a small area of *Plantation on Ancient Woodland (PAWS)*, and offers an opportunity for native woodland restoration.

In some areas, natural regeneration will be the preferred method of restock. A survey of natural regeneration will be conducted at year 5 to assess progress. Where this appears to be developing, a subsequent assessment will be made at year 7; where natural regeneration is not developing satisfactorily, enrichment planting with appropriate species will become the preferred restocking method.

## 2.5 Access and roading 2021-2025

Construction	Length (m)	Area (ha)
New roads	0	0
Tracks	660	1.0

*Table 7 - Summary of roading and tracks*

This plan does not seek to build any new forest roads during the plan period.

The proposed forwarder track in *Table 7* and shown on *Map M06* has already been screened and EIA consent was deemed not to be required (see section 3.2 below).

No new ATV tracks are specified at this time; detailed site planning will take place after felling and separate *Screening Opinion Requests* will be submitted where required.

All timber haulage and heavy machine access will be via the established entrances at Inverchapel, Benmore Botanic Gardens and Strone. Locations and estimated volumes are detailed on *Map M06*.

## 2.6 Standards and guidance on which this plan is based

This plan has been produced in accordance with a range of government and industry standards and guidance as well as recent research outputs. A full list of these standards and guidance can be found here:

<https://scotland.forestry.gov.uk/managing/plans-and-strategies/land-management-plans/links>

## 2.7 Public Consultation

During the development of this *Strategic Larch Felling Plan* and as part of wider communication over issues that *Phytophthora ramorum* presents, FLS has been proactively engaging with stakeholders and local community groups throughout Cowal. The COVID-19 health crisis has affected the ability of FLS to conduct face-to-face engagement, however.

This plan area has been served with several SPHNs which, due to their mandatory nature, do not accommodate a consultation process. The proactive approach proposed in this *Strategic Larch Removal Plan* will introduce an element of public consultation more akin to that of a full 10 year Land Management Plan, since felling coupes have been identified in advance. These plan proposals will be placed on the FLS website for an extended period, to allow stakeholders more time to consider the proposals and comment accordingly. A letter to all stakeholders will be sent with a link to this plan, explaining the reasons for the new format and how to comment. The landscape impact of the felling will be highlighted, with replanting mitigating against the long term impact. This will allow the public and key stakeholders to be informed about the proposed future work, while minimising any time delays associated with a full 10 year LMP process. In addition, ongoing stakeholder engagement will include communications on the FLS website and local newspaper, regular updates to community councils, and information boards at key points.

A public “drop in” event will be organised during the period this plan is on the website to allow stakeholders to question any aspect of the plan with FLS staff. An update on PR will also be given as part of FLS’ PR update programme.



# Cruach Benmore Strategic Larch Removal Plan 2021 - 2025

## 2.8 Tolerance table

	<b>Adjustment to felling period</b>	<b>Adjustment to felling coupe boundaries</b>	<b>Timing of restocking</b>	<b>Change to restocking species</b>	<b>Changes to roadlines</b>	<b>Designed open ground</b>	<b>Windblow clearance</b>
<b>SF Approval not normally required</b>	Felling date can be moved within 5 year period where separation or other constraints are met	Up to 10% of coupe area (up to a maximum of 1ha)	Up to 3 planting seasons after felling  Up to 10 planting seasons for natural regeneration	Change within species group i.e. diverse conifers; broadleaves; Sitka spruce  Non-native conifers in native woodland areas and designated open space up to 400 stems/ha  <20% increase in area of Sitka spruce		Increase by up to 5% of coupe area	
<b>Approval by exchange of letters and map</b>	First phase felling delayed into second or later period  Second phase felling brought forward into first phase	Up to 15% of coupe area	Between 3 – 5 years after felling	>20% increase in area of Sitka spruce	Additional felling of trees not agreed in plan  Departures of >60m in either direction from centre line of road	Increase by up to 10%  Any reduction in open ground within coupe area	Up to 5ha
<b>Approval by formal plan amendment</b>	Felling date of third or later phase brought forward into first or second phase	More than 15% of coupe area	More than 5 planting seasons after felling	Change from specified native species  Change between species groups	As above, depending on sensitivity	More than 10% of coupe area  Colonisation of open areas agreed as critical	More than 5ha





## 3.0 EIA Screening Determination for forestry projects

### 3.1 Proposed deforestation

There is no proposed deforestation within this plan area.

### 3.2 Proposed forest road works

There are no new forest roads within this plan. Some roads may require upgrading for safe timber handling, but where this is required an EIA screening request will be submitted.

Construction of 660m of forwarder track as illustrated on *Map M06* will be required for access and extraction purposes above Puck's Glen, at coupe 10037. A *Screening Opinion Request* has already been submitted for this work and EIA consent was deemed not to be required; this advice is valid until 12/5/2026 (EIA 430 (FLS reference)).

There may be a requirement to build access tracks and ramps for machine access, however these will be temporary measures removed after use. Ramps will be approximately 3m wide and up to about 15m long. They will not be treated as permanent features and will be either allowed to re-vegetate or removed following operations. The final number and location of the ramps will be determined at the time of operations but one ramp per 100m of road/coupe interface is believed to be sufficient. A *Screening Opinion Request* will be submitted for such facilities where required.

For the purposes of restocking it will be necessary to establish a network of ATV routes; these will be temporary features formed from material found on site and it is expected that they will green over within 5 years and blend in to the landscape. No new ATV tracks are specified at this time; detailed site planning will take place after felling and separate *Screening Opinion Requests* will be submitted where required.

### 3.3 Proposed forest quarries

There is one quarry located within this plan area. There is no intention at this time to expand this. Should quarry expansion be required an EIA determination will be submitted separately. The majority of stone for roading work is imported from an FLS quarry in a different plan area.

### 3.4 Proposed afforestation

There is no proposed afforestation within this plan area.

## 4.0 Strategic Larch Removal Plan

### 4.1 Introduction

This is a 5-year plan developed to undertake a structured removal of Larch spp. from the Cruach Benmore plan area to minimise the spread of *Phytophthora ramorum*. It succeeds the plan submitted in 2009. Cruach Benmore has been severely affected by *P. ramorum* infection in Larch spp., resulting in numerous Statutory Plant Health Notices which have necessitated widespread felling that was not originally planned (Map M02). The intention is to create a robust plan to proactively remove Larch spp. from Cruach Benmore and establish the permission to carry out this work. A revised 10 year plan will be produced to succeed this plan which will cover the future forest in greater detail.

### 4.2 Setting and context



Map M01 – Location and viewpoints

Cruach Benmore Forest is located in the Cowal Peninsula on the edge of the Loch Lomond and Trossachs National Park (*Map M01*), and comprises two areas separated by Strath Eachaig. The largest section lies between Holy Loch and Loch Long on the Cowal Peninsula, with an additional area to the northwest between Glen Massan and Loch Eck. The total plan area occupies 1660ha of mainly forested ground (*Map M03*). The slopes are often steep, rising to a 40% gradient, but characterised with large areas of flat ground around the summits which are largely open habitat with small areas of low growth productive forestry. The plan area is highly visual on the local landscape as it rises from sea level to 470m elevation.

The southern sections of the plan area back on to private housing in the villages of Kilmun and Strone which follow the shoreline.

To the north of the plan area are found the Land Management Plan areas of Glen Finart and Loch Eck, where they adjoin significant areas of privately owned land kept for sheep grazing and open hill habitat.

## 4.3 Analysis and key issues

Factors that have been taken in to account in developing this plan are –

- Large areas of Larch spp., much of which have already been infected with *P. ramorum* and are subject to SPHNs.
- Steep slopes above residential property.
- Cool, wet climatic conditions and large areas of wet acidic soil at upper elevations.
- Nationally significant features such as Benmore Botanic Gardens and the Kilmun Arboretum.
- Management of water catchment to reduce the risk of flooding to local property.
- High landscape visibility.
- Recreation and public access.

## 5.0 Management plan proposals

### 5.1 Management

#### 5.1.1 Clearfelling

*Strategic removal of Larch spp.*

The plan described here is focused on the management of the spread of *Phytophthora ramorum* by the removal of Larch spp. over a five year period. Felling proposals are illustrated in *Map M04*. Clearfell coupes will be felled to sensible and windfirm boundaries to maintain the stability of the remaining forest, which will also involve removal of non-Larch species. However, where local conditions allow, selection techniques will be used to reduce the need to remove non-Larch species, especially with regard to native species. The priority is to secure the remaining forest for future sustainability. The proposed felling operations are summarised in *Tables 2 and 3 (Section 2)* and described in detail in the table of operations in *Appendix II*. *Map M04* displays how the proposed management structure will capture the majority of Larch within the plan area.

*Map M04* also shows some areas of more recently planted (PY 2014) Larch spp., and where Larch spp. are known to occur at very low densities as individuals or small scattered groups. This includes the area above Inverchapel in the northeast of the plan area (between thinning coupes 10042 and 10142), and along Glen Massan in the northwest of the plan area. Permission is sought to remove these on a fell to recycle basis, along with any closely associated trees as required for operational or safety reasons.

*Resilience felling*

In addition to the strategic removal of Larch spp., permission is sought for an area of resilience felling above Kilmum (coupe 10030), as shown on *Map M04*. This is to protect the properties and powerline below this area which could be at risk of damage from future windblow events. The intention is to remove trees within 2 tree lengths of our boundary.

All operations will be managed to relevant best practices and adhere to the Forest and Water Guidelines to reduce the risks to the public, the environment and property.

#### 5.1.2 Thinning

Indicative thinning areas are shown on *Map M04* with areas and volumes summarised in *Table 5*. The majority of this work is selective removal and extraction of Larch spp. from mixed stands and on the lower slopes. This is

compatible with CCF management prescribed for these areas, and will be principally single and group selection. On Kilmun Hill (coupe 10019), where access is poor and Larch spp. are typically mixed in size with poor form, these will be selectively felled to recycle.

Thinnings also include the removal of Western Hemlock from coupes 10041 and 10143; this is to remove an invasive seeding source in CCF areas and the intention will be to carry this out at the same time as Larch spp. is removed.

*Resilience felling:* It will be necessary to create access to this area described in *Sections 2.2* and *5.1.1* above by cutting thinning racks in the neighbouring coupe (coupe 10130), currently managed for CCF. This will allow for extraction of timber produce to the forest road without the need for any new infrastructure.

Thinning will normally be carried out to maximise the benefit to the remaining standing trees. This would 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.

## 5.2 Future habitats and species

Restocking across the whole plan area will be fully reviewed when the next full 10 year plan is produced to replace this *Strategic Larch Removal Plan*. The outline plan for restocking of the clearfell coupes proposed in this plan is shown on *Map M05* and described in the *Table of Operations (Appendix II)* on a coupe by coupe basis. Restocking is largely based on proposals approved in the previous plan, with the exception of Larch spp. which will be replaced with suitable alternative conifers and broadleaves. Exact species composition will be determined after detailed site surveying, with reference to those species growing successfully at Kilmun Arboretum and with consultation with Benmore Gardens in the *Gardens and Designed Landscapes* designated area (*Map M07*). There is no expected overall increase in Sitka Spruce in the proposed clearfell areas. Future species composition can be seen in *Table 6* and *Figure 2*, above. Future age structure of the forest can be seen in *Table 4* and *Figure 1*.

Restocking will take place up to 3 planting seasons after felling. Conifer restocking density will be to 2500 stems per ha and broadleaves to 1600 stems per ha.

The area of proposed resilience felling, as shown on *Map M04*, will be restocked with a mix of shrubby and lower growing broadleaf species, with conifer regeneration controlled. This provides the best opportunity to maintain appropriate woodland cover while establishing a resilient buffer to neighbouring properties in the long term. The southern section of coupe 10030 is an area of *Plantation on Ancient Woodland (PAWS)*, and this will be restocked with appropriate native species. In order to secure a more natural habitat here, FLS will accept a percentage of integral open space but not to the detriment of the woodland habitat.

Where Larch spp. is selectively removed in thinning coupes (*Map M04*), natural regeneration will be the preferred method of restock if required and is a realistic expectation. A survey of natural regeneration will be conducted at year 5 to assess progress. Where this appears to be developing, a subsequent assessment will be made at year 7; where natural regeneration is not developing satisfactorily, enrichment planting with appropriate species will become the preferred restocking method.

It should be noted that in the previous plan, there was a long-term objective to lower the planted tree line across the plan area in order to expand the extent of open upland. This will be re-evaluated in the production of the next full 10 year plan and has not been addressed here.

## 5.3 Management of open land

The main areas of open land in the plan area are on the high ground in the eastern area, centred around Cnoc a'Mhadaidh and Kilmun Hill, split by an area of 1990 plantation Sitka spruce.

As summarised in *Section 1* above, and as per restocking in *Section 5.2*, the purpose of this plan is to focus on the strategic removal of Larch spp. and as such the future management of open land has not been revised here. The following points from the previous plan should be noted:

- The previous plan laid out a long-term intention to expand open space in this plan area by lowering the planted tree line
- No afforestation of this area is proposed in this plan
- Management of open space will seek to control regeneration of non-native conifers with a more feathered upper forest margin

The future management of open space, including any expansion and afforestation, will be fully re-evaluated and revised in the next full plan.

## 5.4 Visitor zones and access

Visitor Zones have been identified in areas where FLS encourage and manage access or where the woodland managed by FLS interacts with popular visitor sites or access routes. Visitor Zones are mapped on *Map M08*.

In these areas, single trees or small groups of trees will be removed when necessary to protect facilities, infrastructure and trails, or to enhance the setting of features, or to maintain existing views.

Woodland in these zones will also be thinned, or trees re-spaced, for safety reasons (including to increase visibility to ensure that sites are welcoming and feel safe) and where it is necessary to enhance the experience of the forest setting, through the development of large trees, or preferential removal of trees to favour a particular species.

## 5.5 Deer management

The proposals for restocking include replacing felled Larch spp. with a significant amount of mixed conifer and broadleaf species, much of which will be vulnerable to deer browsing. Deer management measures will be critical to the success of this restocking strategy, including fencing and culling. As explained earlier, the main focus of this *Strategic Larch Removal Plan* is on felling, and restocking is only discussed in outline terms; deer management will likewise be discussed in greater depth in the next full plan.

## 5.6 Other Tree Felling in Exceptional Circumstances

FLS will normally seek to map and identify all planned tree felling in advance through the Land Management Planning 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 plan 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 40 cubic metres per Land Management Plan per calendar year.

## 6.0 Critical success factors

The following are critical to the success of the plan:

- Compliance with SPHNs
- Removal of Larch spp. from the plan area within the 5-year period
- Adequate deer management measures to protect the proposed restocking of diverse soft conifers and broadleaves

## 7.0 Management prescriptions

Clearfelling is the dominant management system that will be used and is focussed on areas containing Larch spp. Coupe design takes into account topography, landscape and operational constraints and is intended to leave the standing forest in a stable and windfirm condition.

In some areas Larch spp. will be specifically targeted and the surrounding trees retained, particularly in the lower slopes in the area from Inverchapel to Kilmun. These operations will take the form of *Single* and *Group Selection* thinnings.

Restocking for productive purposes will be by planting following any necessary site preparation. The latter will include brash management, drainage and cultivation to provide well drained and weed free planting positions. 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, but this must be balanced with the potential requirement for weeding. Softer species may be protected by fencing from animal browsing.

In some areas, natural regeneration will be the preferred method of restock. A survey of natural regeneration will be conducted at year 5 to assess progress. Where this appears to be developing, a subsequent assessment will be made at year 7; where natural regeneration is not developing satisfactorily, enrichment planting with appropriate species will become the preferred restocking method.



## 8.0 Background information

### 8.1 Geology, topography and soils

The underlying geology of the plan area is described as Beinn Bheula Schist, a metamorphic rock found on the northern side of the Highland Boundary Fault. Schists are typically rich in mineral content but prone to indurated soils.

Soil structure throughout the plan area is made up of relatively rich soils. Brown earths occupy the lowest terrain, consistent with the alluvial plain of the deep glens that flow in to Holy Loch and Loch Long. At higher elevations soils tend towards peaty gleys and become more acidic.

### 8.2 Conservation and designations

A designation map (*M07*) has been provided in *Appendix III* of this plan.

The main designation of importance to this plan area is that of Gardens and Designed Landscape around Benmore Botanical Gardens. This extends beyond the gardens to the north and west, land which is managed by FLS.

The northernmost reaches of this plan area are adjacent to the Loch Eck SSSI, designated for its population of Arctic Char. Additionally Loch Eck is a public water supply for the population of Dunoon and is managed by Scottish Water.

There are no known Schedule 1 species breeding or roosting within the plan area, The plan area is part of Red Squirrel Stronghold that runs from Glenbranter in the north to Strone in the south.

### 8.3 Landscape

Due to its geographical position this plan area does have a landscape impact on the wider communities of Dunoon, Sandbank, Gourock and Cove. Graphical visualisations of the operations proposed in this plan accompany this document in *Appendix IV*.

### 8.4 Neighbours

The two sections of the plan area as shown in *Map M01* are separated by Benmore Botanical Gardens and feature some of the original planting from the 1880s. Around the area of the Botanical Gardens the existing planting and management prescription aims to reflect a degree of continuity with the Gardens and maintain that "Big Tree" feel.

The western section of the plan area is flanked by private sector commercial forestry at low level and privately owned open hill ground at upper levels.

The eastern section of the plan area, which constitutes the majority of the plan area, is neighboured by residential properties around almost all of its lowest extent closest to the shoreline. The upper levels of open ground are within FLS management and to the north are found the forests of Glen Finart and Loch Eck. There are 2 active larger commercial properties adjoining the plan area, Blairmore & Strone Golf Club and Blairmore Farm.

## 8.5 Public access

Cruach Benmore has both national and local significance. It is commonly used for local recreation and houses the Kilmun Arboretum which brings tourism from across Scotland as the only national arboretum in Scotland and one of only three across the UK.

There are 3 car parks providing access to the plan area at Inverchapel, Puck's Glen and Kilmun Arboretum. Additionally forest users are able to use the car park at the Botanical Gardens to explore the Big Tree Trail and Puck's Glen trails.

# Cruach Benmore Strategic Larch Removal Plan 2021 - 2025

## Appendix I: Strategic Larch Removal Plan Consultation Record

Statutory Consultee	Nature of consultation	Date contacted	Date response received	Issue raised	Forest District Response
Scottish Forestry	Site visit (FLS and SF staff);  Site visit (FLS and SF staff);  Teams meeting (J Hair (FLS), D Anderson (SF))	12/02/2021;  24/06/2021;  07/07/2021		N/A – site visit, general discussion of issues and the approval process.	
Kilmun Community Council	Phone call (J Hair (FLS) and B Tester (Convenor, Kilmun CC));  Further email to Kilmun CC re. above.	05/08/2021;  18/05/2021		N/A – phone call explaining the proposed format of this <i>Strategic Larch Felling Plan</i> and consultation process;  As above	
Loch Lomond and Trossachs National Park	Site visit (FLS staff and S Franks, LLTNP)	19/04/2021	20/04/2021	Scale of felling – extend felling period from 5 to 10 years to mitigate cumulative impact?  Landscape mitigation of larch felling in connection with road infrastructure;  Diverse mix of restock species; improvement of woodland habitat network; expansion of native woodland	Proposals are driven by existing and anticipated SPHNs. <i>P. ramorum</i> is already widespread in Cruach Benmore, so it is not realistic to extend;  This comment relates specifically to Cruach Tarbeirt and should not be an issue in Cruach Benmore;  Restocking proposals currently as per previous plan, with Larch spp.

## Cruach Benmore Strategic Larch Removal Plan 2021 - 2025

					replaced by mixed conifers or broadleaves; restocking proposals will be fully revised in next LMP
Kilmun Community	Public drop-in session describing spread of <i>P. ramorum</i>	21/01/2020		N/A – information only	
Wider stakeholders	Email updates describing spread of <i>P. ramorum</i> ; Updates to website	Various dates		N/A – information only	

## Appendix II: Table of Operations



Cruach Benmore - Table of Operations 2021-2026

Management Coupe	Species	Area (ha)	Age	Number of Trees	Volume (m3)	Reasoning & Operation	Opportunities	Outline Restock	Status
10008	HL	1.7	45	2343	575	Clearfell - strategic removal of Larch and other species to windfirm boundaries	The creation of open space could potentially improve the landscape appearance in this area, though future access will need to be considered	Predominately Mixed Conifers and riparian broadleaves, with Sitka spruce on upper levels. Fencing will be required to protect the soft species as residential properties at the lowest elevations prevent an active culling programme.	Proposed
10008	HL	1.7	45	2343	575				
10008	JL	0.2	90	175	104				
10008	NS	1.2	90	1244	714				
10008	SS	21.7	41-56	30583	14368				
<b>10008 Total</b>		<b>26.4</b>		<b>36689</b>	<b>16337</b>				
10012	HL	2.9	21	5939	402	Clearfell - strategic removal of Larch and other species to windfirm boundaries	Prioductivity is still an objective in the plan area. With the strategic removal of mature larch in 10019 above creating a softening of the tree line, there is an opportunity to maximise productivity here.	Predominately Sitka spruce restock with potentially minor elements of soft conifers and broadleaves; broadleaves on lower slopes and riparian areas but control of non natives will be required.	Proposed
10012	SS	16.8	21	38834	2538				
<b>10012 Total</b>		<b>19.7</b>		<b>44773</b>	<b>2940</b>				
10017	EL	1.6	72	2343	500	Clearfell - strategic removal of Larch and other species to windfirm boundaries	This area has been identified as an extension to the Kilmun Arboretum, taking the lessons observed from the smaller scale plantings in the original Arboretum and increasing the scale of the more succesful. There is also an opportunity to extend waymarked walking routes from the Arboretum car park to offer a wider variety of options to users.	A mixture of soft conifers and broadleaves will be replanted with Sitka Spruce at the upper elevations.	Proposed
10017	JL	2.7	72	3939	825				
10017	MOP	0.3	96	692	97				
10017	MOP	0.3	96	692	97				
10017	SP	1.5	72	2079	628				
10017	SS	14.7	52-72	20922	9623				
10017	WH	0.0	62	27	17				
<b>10017 Total</b>		<b>21.1</b>		<b>30694</b>	<b>11787</b>				
10019	EL	0.9	91	100	470	Thinning - strategic removal of uninfected Larch only, fell to recycle. No access for extraction, wide spaced, variable size and poor form.	The creation of open space could potentially improve the landscape appearance in this area	n/a	Proposed
<b>10019 Total</b>		<b>0.9</b>		<b>100</b>	<b>470</b>				
10023	CP	0.0	72	1	0	Clearfell - strategic removal of Larch and other species to windfirm boundaries	This area has been identified as an extension to the Kilmun Arboretum, taking the lessons observed from the smaller scale plantings in the original Arboretum and increasing the scale of the more succesful. There is also an opportunity to extend waymarked walking routes from the Arboretum car park to offer a wider variety of options to users.	A mixture of soft conifers and broadleaves. Protection and control of non native invasives will be required.	Proposed
10023	DF	1.0	72	955	708				
10023	EL	0.5	96	482	290				
10023	HL	1.0	62	1063	413				
10023	JL	0.1	72	66	18				
10023	MB	0.0	62	41	4				
10023	MOP	0.3	96	586	82				
10023	RC	0.5	57	323	365				
10023	SP	0.0	72	1	0				
10023	SS	7.0	52-72	10066	4410				
10023	WH	0.1	62	119	53				
10023	XC	0.9	57	901	548				
<b>10023 Total</b>		<b>11.2</b>		<b>14604</b>	<b>6889</b>				

Cruach Benmore - Table of Operations 2021-2026

Management Coupe	Species	Area (ha)	Age	Number of Trees	Volume (m3)	Reasoning & Operation	Opportunities	Outline Restock	Status
10029	CP	0.7	60	859	339	STH19_0332 STH20_0021 Clearfell of all species, retaining any broadleaf and Scots Pine species where possible	This area has been identified as an extension to the Kilmun Arboretum, taking the lessons observed from the smaller scale plantings in the original Arboretum and increasing the scale of the more successful. There is also an opportunity to extend waymarked walking routes from the Arboretum car park to offer a wider variety of options to users.	A mixture of soft conifers and broadleaves will be replanted with Sitka Spruce at the upper elevations.	APPROVED BY AMENDMENT 20/12/2019 Amendment 208 Felling Permission until 29/06/2022
10029	DF	1.6	26-70	2060	1001				
10029	EL	3.2	70-94	4737	1024				
10029	HL	2.4	60-94	1668	1668				
10029	JL	14.3	47-94	16803	6063				
10029	MOP	0.0	94	73	10				
10029	SP	3.3	70	4922	1293				
10029	SS	4.8	47-90	7329	3117				
10029	WH	0.1	60	221	87				
<b>10029 Total</b>		<b>30.3</b>		<b>38670</b>	<b>14602</b>				
10030	BI	1.0	51-101	1890	205	Resilience clearfell to provide protection to property potentially at risk from windblown trees post removal of Larch species in the area	Provide protection and slope stability to the properties below. Opportunity for PAWS restoration in southern section.	Shrubby broadleaf species to provide woodland cover but avoid being a future risk to neighbouring property. Southern section is PAWS and will be restocked with suitable native species.	Proposed
10030	CAR	0.2	51	381	26				
10030	DF	0.2	37-151	181	118				
10030	HL	0.1	60	87	57				
10030	JL	0.4	42-151	427	179				
10030	MB	0.6	46-95	1479	93				
10030	MC	0.5	37-101	1116	128				
10030	OK	1.0	221	1036	401				
10030	RC	0.0	95	9	9				
10030	SP	0.1	151	76	66				
10030	SS	0.8	32-50	1549	410				
10030	XB	0.0	37-95	62	5				
<b>10030 Total</b>		<b>4.8</b>		<b>8292</b>	<b>1697</b>				
10031	DF	0.8	70-151	756	576	STH20_0021 Clearfell of all species, retaining any broadleaf and Scots Pine species where possible	This area will be a further extension to the opportunities of coupe 10029, increasing the size of the National Arboretum.	A mixture of soft conifer and broadleaf species with possibly some minor elements of Sitka Spruce.	APPROVED BY AMENDMENT 05/01/2021 Amendment 217 Felling Permission until 06/07/2022
10031	EL	0.1	94	77	62				
10031	HL	2.9	60-94	2136	1894				
10031	JL	0.8	47-151	677	525				
10031	MB	0.0	60	63	5				
10031	SP	0.4	151	316	273				
10031	SS	1.2	47-94	1347	920				
<b>10031 Total</b>		<b>6.1</b>		<b>5371</b>	<b>4255</b>				
10033	DF	0.2	26	510	31	Clearfell - strategic removal of Larch and other species to windfirm boundaries	This area has been identified as an extension to the Kilmun Arboretum, taking the lessons observed from the smaller scale plantings in the original Arboretum and increasing the scale of the more successful. There is also an opportunity to extend waymarked walking routes from the Arboretum car park to offer a wider variety of options to users.	A mixture of soft conifers and broadleaves will be replanted with Sitka Spruce at the upper elevations. Protection and control of non native invasives will be required.	Proposed
10033	HL	0.5	72	464	296				
10033	JL	6.7	72	8073	2708				
10033	SP	0.4	72	482	217				
10033	SS	13.6	33-90	26406	7061				
<b>10033 Total</b>		<b>21.4</b>		<b>35935</b>	<b>10314</b>				



Cruach Benmore - Table of Operations 2021-2026

Management Coupe	Species	Area (ha)	Age	Number of Trees	Volume (m3)	Reasoning & Operation	Opportunities	Outline Restock	Status
10037	DF	1.0	62	1128	676	Clearfell of all species, retaining any broadleaf and Scots Pine species where possible	The current approved plan identified little of this area to be restocked. Upon revisiting the location in 2020 it is felt that reducing the planting line was not as necessary as previously thought and that most of the area could be replanted with no negative impact to the landscape.  A timber handling area has been identified to keep forest operations away from the higher public access adjacent areas.	A mixture of soft conifer and broadleaf species to reflect the existing planting closest to the powerline with up to 50% Sitka Spruce in the southern most part of the coupe.	APPROVED BY AMENDMENT 05/01/2021 Amendment 224 Felling Permission until 06/07/2022
10037	EL	1.4	61	1590	650				
10037	HL	7.7	35-62	12941	2240				
10037	JL	1.0	42	1292	379				
10037	LP	0.3	57	520	93				
10037	MC	1.0	37-42	1886	304				
10037	SS	8.9	35-114	18486	4256				
10037	WH	0.8	62-63	1109	706				
10037	XB	1.5	35	4217	159				
10037	XC	0.4	35	994	47				
<b>10037 Total</b>		<b>24.0</b>		<b>44164</b>	<b>9510</b>				
10040	CP	1.7	69	2213	856	Clearfell of all species, retaining any broadleaf and Scots Pine species where possible	Productivity is still to be an element of this plan area and this area, away from the public access and less visible on the landscape, is best suited to that objective.	Predominantly Sitka Spruce with some elements of soft conifer and mixed broadleaf.	APPROVED BY AMENDMENT 25/10/2019 Amendment 206 Felling Permission until 29/06/2022
10040	DF	1.1	68-114	1097	670				
10040	EL	0.3	69	375	132				
10040	HL	0.0	27	2	2				
10040	JL	6.5	69-98	7579	2718				
10040	LP	1.0	69	2187	347				
10040	MC	0.3	69	326	124				
10040	NS	2.5	69	2151	1948				
10040	SP	0.6	69	979	168				
10040	SS	6.9	28-69	10140	4826				
10040	WH	0.4	63-69	536	338				
<b>10040 Total</b>		<b>21.2</b>		<b>27585</b>	<b>12129</b>				
10041	EL	0.6	69-147	779	247	Thinning of all Larch species with up to 150m3 of other species to allow machine access	The long term aim has been CCF in this area but it has generally been left. The felling requirements in here create an opportunity to restart a CCF programme.	Areas of Larch removal to be replanted with a mixture of 'big tree' soft conifers to match the current historical planting. Protection and control of non native invasives will be required	APPROVED BY AMENDMENT 5/1/2021 Amendment 229 Felling Permission until 06/07/2022
10041	HL	0.2	27	334	41				
10041	JL	2.7	69-114	2919	1375				
<b>10041 Total (Larch)</b>		<b>3.5</b>		<b>4033</b>	<b>1664</b>				
10041	WH	3.7	53-71	5647	3206	Thinning - Strategic removal of Western Hemlock to reduce seeding source in a CCF area	The long term aim has been CCF in this area but it has generally been left, the felling requirements in here produce a potential to restart a CCF programme.	Areas of Hemlock removal to be replanted with a mixture of 'big tree' non invasive soft conifers to match the current historical planting.	<b>Proposed</b>
<b>10041 Total (WH)</b>		<b>3.7</b>		<b>5647</b>	<b>3206</b>				
10042	HL	1.3	27	256	22	Thinning - strategic removal of minor component HL in predominantly SS coupe.	The creation of open space could potentially improve the landscape appearance in this area	n/a	<b>Proposed</b>
<b>10042 Total</b>		<b>1.3</b>		<b>256</b>	<b>22</b>				

Cruach Benmore - Table of Operations 2021-2026

Management Coupe	Species	Area (ha)	Age	Number of Trees	Volume (m3)	Reasoning & Operation	Opportunities	Outline Restock	Status
10047	DF	0.4	41-42	574	153	STH20_0379_1058 Clearfell of all species, retaining any broadleaf and Scots Pine species where possible	Using a mixture of planted and open space there is potential to improve the landscape element of this area as part of the Landscape designation.	A mixture of soft conifer and broadleaves at lower elevations with Sitka Spruce at higher elevations. An element of open ground on uppermost levels, consistent with existing LMP's long-term goal.	APPROVED BY AMENDMENT 24/2/2021 Amendment 233 Felling Permission until 06/07/2022
10047	JL	8.7	68-114	10723	3374				
10047	NS	1.8	68	2152	971				
10047	SP	2.1	68	3036	818				
10047	SS	24.1	41-68	48000	12780				
<b>10047 Total</b>		<b>36.9</b>		<b>64486</b>	<b>18096</b>				
10050	BI	0.5	23	260	15	Clearfell - strategic removal of Larch and other species to windfirm boundaries	Usage of open space could help to break up areas of solid Sitka and improve the landscape appearance, continued access for future operations will need to be an important consideration as winch is the only removal option.	A mixture of soft conifer and broadleaves at lower elevations with Sitka Spruce at higher elevations.	<b>Proposed</b>
10050	DF	0.2	26	8	22				
10050	HL	0.2	23	65	17				
10050	JL	1.1	116	768	795				
10050	LEC	0.2	23	709	31				
10050	ROW	0.1	23	18	6				
10050	SCI	0.1	23	18	6				
10050	SP	0.7	73	484	166				
10050	SS	8.5	26	17617	2923				
<b>10050 Total</b>		<b>11.7</b>		<b>19948</b>	<b>3982</b>				
10102	HL	7.2	31-32	15362	1299	STH20_0082_0251 Fell to recycle of all Larch species with an extra volume of Sitka to establish sensible boundaries		Sitka spruce, diversity in this area will be enhanced at the next rotation if the adjacent crop	APPROVED BY AMENDMENT 5/1/2021 Amendment 226
10102	SS	1.7	31-32	3874	402				
<b>10102 Total</b>		<b>8.9</b>		<b>19236</b>	<b>1701</b>				
10130	MC/MB	20.9	34-121	-	1045	Thinning operation to create access racks to resilience felling in coupe 10030 below, without construction of new infrastructure.	Opportunity to thin area of CCF	n/a	<b>Proposed</b>
<b>10130 Total</b>		<b>20.9</b>		<b>0</b>	<b>1045</b>				
10140	JL	2.3	69	1803	1414	STH_0321_0322 Clearfell of all species, retaining any broadleaf and Scots Pine species where possible		Predominantly Sitka Spruce with some elements of soft conifer and mixed broadleaf.	APPROVED BY AMENDMENT 10/11/2020 Amendment 222 Felling Permission until 29/06/2022
10140	EL	0.2	151	356	56				
10140	SP	0.7	151	1087	254				
10140	SS	0.6	69	877	365				
<b>10140 Total</b>		<b>3.7</b>		<b>4123</b>	<b>2088</b>				
10142	EL	2.6	71-153	2866	1217	Thinning - strategic removal of uninfected Larch by removal of pockets rather than large scale clearfell	The long term aim has been CCF in this area but it has generally been left, the felling requirements in here create an opportunity to restart a CCF programme.	Areas of Larch removal to be replanted with a mixture of 'big tree' soft conifers to match the current historical planting	<b>Proposed</b>
10142	HL	0.1	29	155	19				
10142	JL	0.3	71	152	107				
<b>10142 Total</b>		<b>3.0</b>		<b>3173</b>	<b>1343</b>				
10143	EL	3.4	153	3441	1663	Thinning - strategic removal of uninfected Larch by removal of pockets rather than large scale clearfell	The long term aim has been CCF in this area but it has generally been left, the felling requirements in here create an opportunity to restart a CCF programme.	Areas of Larch removal to be replanted with a mixture of 'big tree' soft conifers to match the current historical planting	<b>Proposed</b>
10143	HL	0.4	62	369	240				
10143	JL	0.4	153	265	327				
10143	WH	2.0	65	3157	1694				
<b>10143 Total</b>		<b>6.3</b>		<b>7232</b>	<b>3923</b>				

Cruach Benmore - Table of Operations 2021-2026

Management Coupe	Species	Area (ha)	Age	Number of Trees	Volume (m3)	Reasoning & Operation	Opportunities	Outline Restock	Status
10152	JL	0.6	41	1087	147	Thinning - strategic removal of Larch by removal of pockets or single trees rather than large scale clearfell	This area forms a buffer between the botanic gardens and productive forestry within the Designed Garden and Landscape designation, a CCF light touch is potentially the best management solution.	Areas of Larch removal to be replanted with a mixture of 'big tree' soft conifers to match the current historical planting	Proposed
<b>10152 Total</b>		<b>0.6</b>		<b>1087</b>	<b>147</b>				
10160	BI	0.4	27	38	9	Clearfell - strategic removal of Larch and other species to windfirm boundaries	This area forms a buffer between the botanic gardens and productive forestry within the Designed Garden and Landscape designation	Mixed conifer and broadleaf designed in co-ordination with the Botanical Gardens. Protection in this area will be difficult and fencing the best protection solution.	Proposed
10160	HL	0.3	27	19	29				
10160	SS	10.5	27	17988	2551				
<b>10160 Total</b>		<b>11.2</b>		<b>18044</b>	<b>2589</b>				
<b>Grand Total</b>		<b>298.9</b>		<b>434141</b>	<b>130736</b>				



## Appendix III: Maps



## Appendix IV: Visualisations

