North Region
Raasay Land Management Plan

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Raasay Land Management Plan 2019-2029

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Raasay Land Management Plan 2019-2029

Vision

Raasay will be a varied forest of alternative conifers and broadleaves at different ages and sizes. It will reflect the designed landscape associated with Raasay House. It will be made up of small, windfirm coupes to provide timber and firewood for the island. The heritage features of the forest will be enhanced and protected where necessary. The trails within the forest will provide excellent opportunities for recreation and amazing views of the forest and Skye.

Summary and Proposals

This Land Management Plan (LMP) is a full renewal of Raasay Forest Design Plan. The land holding is approximately 290ha of which approximately 40% is forest and 60% is open. Of the forest area approximately 30% of it is felled awaiting replanting. The forest on Raasay is made up of two blocks, Inverarish (196ha) in the south near the village and Brochel (94ha) in the north. The plan period will be 2018 to 2028. (**See Map 1 Location** for the LMP Boundary)

FES are proposing to undertake **13ha** of clear felling within the plan period, focused around removing remaining larch stands in the Inverarish block and then further spruce coupes at risk of windblow. A gross area of **21ha** will be restocked using standard planting, there will also be **111ha** established through natural regeneration. FES will manage **9.5ha** under continuous cover forestry which will mostly be group selection systems.

What's important/ unique?

- Designed landscape
- Risk of Phytophthora ramorum infection
- High recreation use
- Sustainable low volume timber and woodfuel production
- Highly visible landscape
- Archaeological sites and historic interest
- High community interest and potential future ownership
- Island working costs
- White tailed eagle and Golden eagles

Raasay Land Management Plan Aims

- **Timber production**: reduce plant health risks by felling larch and Lodgepole pine in the first phase of the plan creating low volume sustainable future production for firewood and timber use on the island.
- **Biodiversity:** maintain important habitats for golden and sea eagles and herons. Improve riparian habitats and control rhododendron.
- **Resilience**: diversify the range of productive tree species and restructure even aged stands.
- **People**: manage recreation facilities and trails with community involvement. Manage Scheduled Ancient Monuments to enhance visitor experience.
- **Landscape**: maintain and enhance the features of the designed landscape where large scale clearfelling has been undertaken.

Appendix 3 – The LMP brief details how this plan will contribute towards the commitments of the IRS Forest District Strategic Plan.

Proposals for the future management of the forests in this plan area are made in accordance with all current industry best practice guidelines and have been prepared following full consultation with the relevant agencies, community representatives and external stakeholders. Operations arising from the approval of this plan will also comply with all current FCS guidance and any subsequent revisions published during the plan approval period.

1.0 Introduction

1.1 Strategic Policy

Raasay Land Management Plan has been prepared in line with the UK Forestry Standard (2011), UKWAS guidelines (2017), the Scottish Forestry Strategy (2006) and Forest Enterprise Scotland Corporate Plan 2017-19 states the overall strategic plan for the National Forest Estate. The FES National Spatial Overview provides context for the corporate plan and how that translates in to this Land Management Plan and highlights what is important for Zone 2 (North Western Coast and Skye), this has been used to inform the plan brief (Appendix 3). Forest Enterprise Scotland's long term planning is aligned to Scottish Government Scotland Performs objectives and the Scottish Government Land Use Strategy.

The management of Forestry Commission Scotland's national forest estate is guided by The National Strategic Directions, which identifies six aspirations that the National Forest estate is:

- Healthy: achieving good environmental and Silvicultural condition in a changing climate
- Productive, providing sustainable economic benefits from the land.

- Treasured, as a multi-purpose resource that sustains livelihoods, improves quality of life and offers involvement and enjoyment.
- Accessible, local woodlands and national treasures that are well promoted, welcoming and open for all.
- Cared for, working with nature, respecting landscapes, natural and cultural heritage.
- Good Value, exemplary, efficient and effective delivery of public benefits.

The national commitments and district specific actions were used to develop the basis of this LMP and further details of this linkage are provided in **Appendix 3 – LMP Brief**. Integral to the Raasay LMP is the district aspiration to make the National Forest Estate;

• Healthy: Adapting the National Forest Estate to climate change and build resilience to extreme weather events by diversifying structure and species and creating more windfirm stands.
• Productive: Continue to produce a sustainable supply of timber whilst retaining windfirm stands to maintain production at a constant level in to the future.
• Treasured: Investigate opportunities for partnership working with communities.
• Access: Help visitors to experience and enjoy the outdoor environment, encourage use of the estate for health benefits and outdoor learning.
• Cared for: Manage designated land to bring qualifying features into, or maintain, favourable ecological condition.

Appendix 1 – The forest planning framework in Scotland gives context to the purpose and scope of this Land Management Plan. In compliance with UKFS this is a strategic and indicative plan intended to state the objectives of management and how sustainable forest management will be achieved by signposting the relevant guidance and best practice and by spatially identifying management aspirations. This plan also provides a means to communicate our proposals to the neighbouring communities and stakeholders and serves as an agreed statement of intent against which progress can be measured.

Appendix 1 also illustrates the levels of operational plans that sit below, and are informed by this LMP. In compliance with UKFS the operational plans detail specific implementation including:

- Potential hazards to workers and forest users
- Operational detail specific to machine use
- Safeguards and mitigation measures to protect the immediate site and, by association, the wider forest
- Detail of post operations planning including the treatment of any waste materials identified.
- Contingency planning

Appendix 2 – Key policies and guidance details the external policy drivers for the proposals in this plan. Current industry and FC guidance will be complied with during any operations associated with this plan, including any subsequent guidance revisions published during the plan's ten year approval period.

Table 1- Aims and Objectives shows the main aims of the forest, how we will achieve these and how we will monitor the success of these.

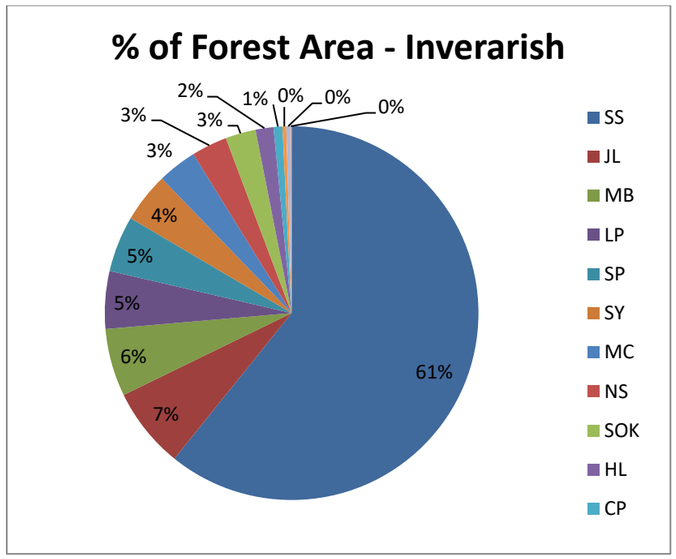
Aim	Objective	Monitoring
Timber production: Timber production will focus on creating small parcels of timber that can be used as firewood on the island or by the local sawmill for sawn timber.	Implementation of the LMP felling & restocking proposals, designed in liaison with the FCS landscape architect.	Implementation of the felling and future habitat and species proposals will be reviewed annually through the delivery of the harvesting and restocking programme and formally at year five & ten.
	Where required, undertake fertiliser application on second rotation crops with productive potential suffering nutritional deficiency.	This will be delivered by the operations team; all crops showing signs of nutrient deficiency will be hand fertilized, specifically for phosphate.
	Manage the deer population at a level that allows successful establishment of restock crops.	Deer counting and nearest neighbour surveys will be undertaken to determine population numbers, assess impact on establishing trees and open habitat; this information in turn will be used to inform cull targets. Stocking density assessment will be used to monitor successful establishment and levels of deer damage. Fence surveys will be undertaken to maintain them as deer proof.

	Identify mature coupes that are windfirm where felling could be delayed in order to maintain the production forecast at a constant level in to the future.	An assessment of GALES will identify which stands are windfirm. These will be monitored by operations teams to ensure windblow does not reach unacceptable levels. Where windblow levels are unacceptable the stand will be felled.
Biodiversity:	Riparian zones will be maintained as minimum intervention with a mix of open areas, mature native broadleaf and conifers. The amount of broadleaf stands will be increased over the plan period.	Restocked areas and natural regeneration areas will be monitored using the natural regeneration monitoring survey. Productive stands of broadleaves and conifers will be surveyed using the stocking density assessment method.
	In known areas for sea eagle nesting mature trees will be retained where possible to maintain good nesting sites.	Sea eagle nesting will be monitored annually to see where nests are being used.
	The forest is 61% Sitka spruce, the future restocking will aim to reduce the reliance on Sitka spruce as the main productive conifer. Alternative conifers will be introduced to increase resilience to climate change and pests and diseases.	The Shannon Index is a measure of diversity that can be applied to any collection of species. This will be calculated before and after the plan to monitor the species diversity.
Resilience: diversify the range of productive tree species and restructure even aged blocks.	The remaining larch (7ha) will be felled in the first phase of the plan. Rhododendron will continue to be controlled and SPHNs will be responded to when issued.	FCS tree health team will conduct aerial surveys via helicopter twice a year. Ground based surveys will also be undertaken by FCS to look at the rhododendron for potential infections.
Healthy: remove the risk of future P. ramorum infections in larch. Remove the lodgepole pine which is heavily infected with Dothistroma needle blight (DNB).	Infected lodgepole pine along roadside will be felled in the first phase. The remaining larch (7ha) will also be felled in the first phase of the plan. Rhododendron will continue to be controlled and SPHNs will be responded to when issued.	DNB surveys undertaken alternate years to monitor infection levels. FCS tree health team will conduct aerial surveys via helicopter twice a year for *P. ramorum* infection in larch. Ground based surveys will also be undertaken by FCS to look at the rhododendron for potential infections.
Treasured: enhance the visitor experience for visitors to all Scheduled Ancient Monuments in the forest.	Make all sites safe- especially the mine No 2 buildings and mine shaft. Maintain interpretation to continue to provide visitor information.	All buildings will be monitored to ensure they are safe. Any surrounding fences and signs will monitored and maintained.

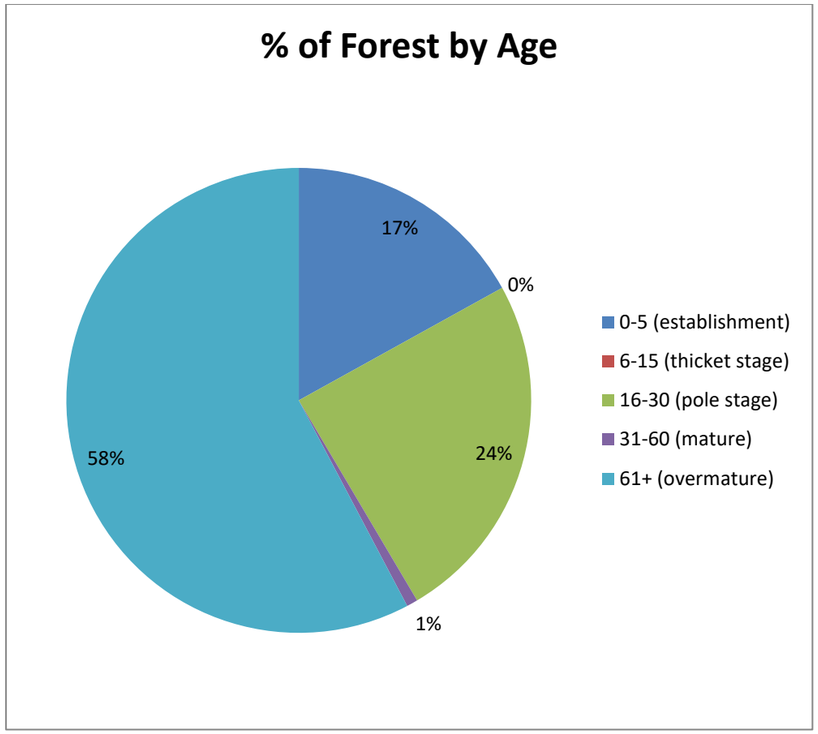
2.0 Background Information

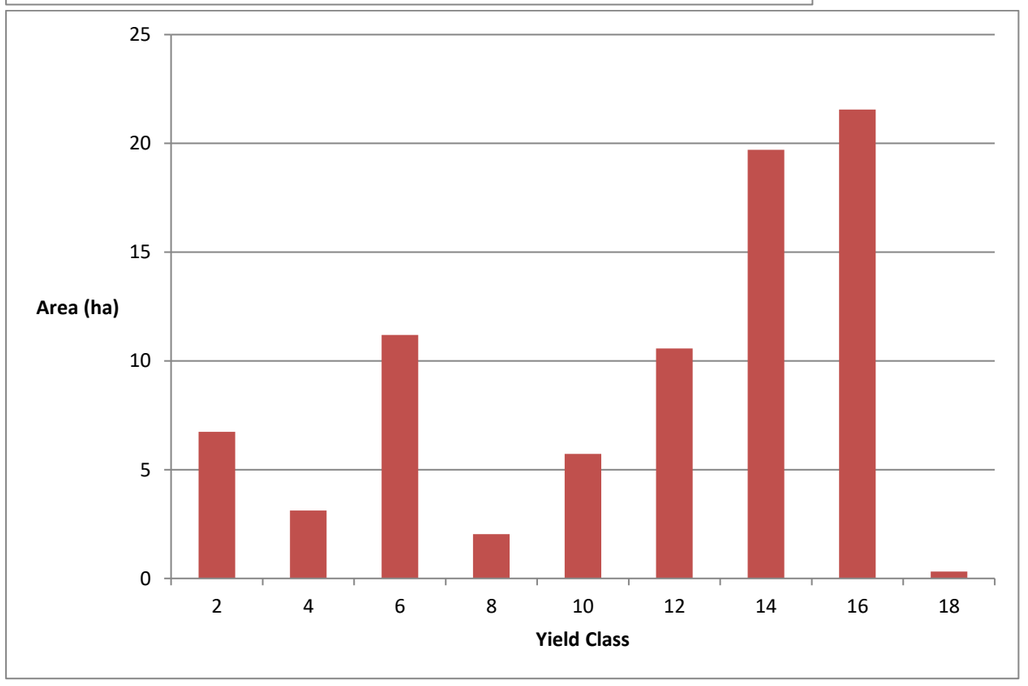
2.1 The Forest

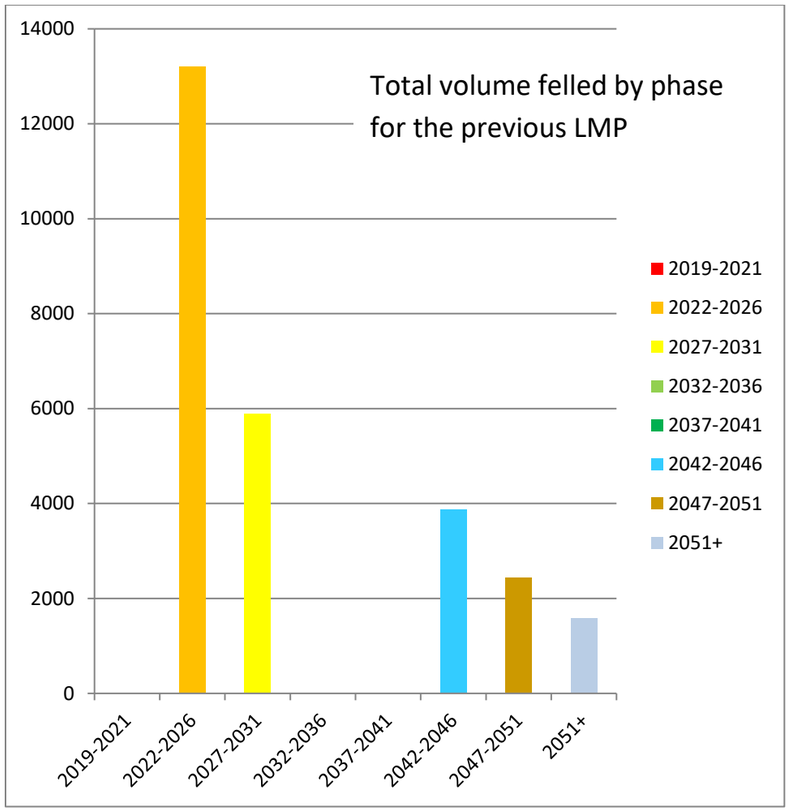
Raasay is a small island between Skye and the mainland. Inverarish and Brochel Forest were bought by the Forestry Commission in 1950 from the Department of Agriculture. The total land holding of Inverarish is 196ha and Brochel is 94ha. Approximately 33ha of Inveraraish has been felled since 2016 to deal with Statutory Plant Health Notices served for Phytophthora ramorum infections in larch and rhododendron. Half of the Inverarish block is classified as designed landscape in association with Raasay House plantings in the 1800s- as shown on **Map 14- Designed Landscape**. The Brochel block is in the north of the island and was felled in 2001 and has been monitored for natural regeneration since then.



Shannon Index 1.55







2.2 Open Habitat

The only open habitat in the forest is upland heath habitat and scree in the north of the Inverarish block. This will be retained as open over the plan period. There are open areas within the forest which

2.3 Geology, Soils, Climate and Slope Stability

Inverarish

There is complex geology with granite intrusions on the higher ground in the south producing an acidic soil that is mostly unflushed blanket bog, previously planted with Sitka spruce and Lodgepole pine. Oskaig plantation is overlying gabbro producing a fertile basic brown earth soil. The remainder of the forest is a mixture of micaceous and calcareous sandstones which has created typical brown earth in the inverarish glen with peaty surface water gleys to the north of this. The torridon shales on Raasay contain the oldest fossilized plant remains yet found. A unique type of loam in the centre of the island indicates that Raasay was not glaciated and therefore shows a rare flora community.

The climate varies from warm and wet with minimal exposure below 100m altitude to cool, wet and moderately exposed above this. There is an area with slope stability problems in the Oskaig forest where a steep bank meets the public road, this is indicated on **Map 7- Natural Hazards.**

Brochel

This block is a mixture of sandstone, mudstone and siltstone with 3 basalt dykes running through it. This has created the terracing of the site due to the relative resistance to erosion and weathering. The soils are upland brown earth along the coastline. Above 100m the soils change to an unflushed blanket bog in the south and peaty surface water gley in the north. This whole site is currently felled and there is some regeneration of native broadleaves.

The climate varies from warm, moist and sheltered at the coast to cool, wet and moderately exposed above 100m altitude. There are no slope stability issues in this block.

2.4 Landscape

Raasay is made up of 2 forest blocks: Inverarish in the south near the village and Brochel in the north. Inverarish is a mixture of steep sided glens that run up to Can nan Eun, it is highly visible from the ferry and within the village. The majority of Inverarish is a designed landscape that date back to the 18th century- as shown on Map 14. Brochel is a steep, terraced slope with an Easterly aspect; it is visible from the sea and also the popular tourist destination of Applecross.

Brochel Forest – showing terracing and natural regeneration

2.5 Surrounding land use

The majority of the neighbouring land is rough grazing hill ground used mostly for sheep grazing by the local crofting community. Some fields are used for silage cutting. The majority of this land is owned by the Scottish Government and leased for agricultural use. There is a community owned woodland in the south of Inverarish that is to the east of the Inverarish burn. North east of the Inverarish block is a woodland planting scheme that has failed. Brochel forest is surrounded by rough grazing ground.

2.6 Community

Raasay had a population of 161 people in 2011. There are a number of interest groups/ organisations on the island, these are:
Crofting Committee
Raasay Development Trust
Raasay House
Archaeology Group

The forest is highly used by the island community for recreation. The community were planning to buy the forest, however the interest in this reduced following the P. ramorum infection of larch in 2015 and 2017. There is still some interest in the community to buy the forest as it could be used to provide firewood for domestic purposes and for a planned biomass boiler in Raasay House as well as small parcels of logs for the privately owned sawmill on the island. In the past timber has been sold to the community for firewood and also to the local sawmill to mill and use locally. The community may be interested in buying the forest once all the larch has been felled.

Two local meetings were held to gain the opinions of the communities and discuss their thoughts, see **Appendix 5 - Consultation Record** for details.

2.7 Renewable Energy

FCS run a residual renewable energy offer which closed in March 2014; this was to allow communities and the industry the opportunity to identify and develop planning proposals for potential small scale renewable energy schemes on the National Forest Estate.

Renewable developers explored the option of a run of river renewable energy scheme using the Inverarish burn near mine No 1. This project was not continued because the cable to the island is not of a large enough capacity to take the electricity from a hydro scheme to the mainland. It is unlikely such projects will become viable in the future unless the seabed cable is upgraded.

Potential implications on forest design and management, as a result of renewable energy developments, will be addressed through the respective developers planning application and where required amendments to the Land Management plan.

Further information on the development of renewable energy schemes is provided via the link below;

http://scotland.forestry.gov.uk/managing/work-on-scotlands-national-forest-estate/renewable-energy

3.0 Key Features

3.1 Water

There are no rivers identified by SEPA on Raasay. **Map 7- Natural Hazards** shows the flood risk areas. The Inverarish burn has been identified as a potential for flood risk however there is limited infrastructure at risk from this. Flooding of the Inverarish burn has occurred in the past due to a log dam being released and flooding the Historic Society site.

3.2 Priority Species and Habitats

Table 1: Annex I, EPS, BAP Species & Habitats Supported by this LMP		
FCS Scottish Forestry Strategy - Special Focus Species and/or SNH – Species Action Framework; Annex1 species relevant to this LMP area	**Objective**	**Actions supported by LMP**
White-tailed- eagle (also Annex I species)	Undertake survey and record to determine distribution in order to inform conservation management.	Protect breeding/roost sites. Improve habitat by leaving mature trees to encourage roosting/breeding where appropriate in consultation with neighbouring land owners.
Peregrine (Annex1)	Undertake survey and record to determine distribution in order to inform conservation management.	As a result of coupe check surveys or other recordings during site visits, integrate protection of the species and its breeding sites during woodland management if necessary.
UKBAP Priority species (The list is not exhaustive) relevant to this LMP area.	**Objective**	**Actions supported by LMP**
Otter (also EPS)	Survey, Monitor for species. Protect.	As a result of coupe check surveys or other recordings during site visits, integrate protection of holts and of the species during woodland management where necessary. Manage riparian margins to provide wetland vegetation as sheltered habitats.
Bats (also EPS)(Soprano pipistrelle & Brown long-eared bat)	Survey, Monitor for species. Protect.	As a result of coupe check surveys or other recordings during site visits, integrate protection of breeding/roost sites and of the species during woodland management where necessary. Generally protect ancient trees and old buildings which are potential for bat roosts.
Other UKBAP species relevant to this LMP area (the list is not exhaustive)	**Objective**	**Actions supported by LMP**
Other Bats (also EPS)	Survey, Monitor for species. Protect	As a result of coupe check surveys or other recordings during site visits, integrate protection of breeding/roost sites and of the species during woodland management where necessary. Generally protect ancient trees which are potential for bat roosts.

Golden eagle (also Annex I species)	Survey, record.	Undertake further survey to determine distribution in order to inform conservation management.
Other protected Species	**Objective**	**Actions supported by LMP**
Raasay Vole	Survey, Monitor for species. Protect	As a result of coupe check surveys or other recordings during site visits, integrate protection during woodland management if necessary.
Habitat Priorities (EU Annex I and/or UKBAP Priority Habitats) relevant to this LMP area	**Objective**	**Actions supported by LMP**
Upland Wet & dry heath	Survey and record to identify location/extent and protect	Remove non-native trees from key representative wet and dry heath. Do not plant on key areas representative of wet and dry heath.
UK BAP Habitat (The list is not exhaustive)	**Objective**	**Actions supported by LMP**
Ancient woodland of Plantation Origin.	Habitat protection and enhancement	Remove non-native trees. Retain native trees. Expand this habitat through encouraging natural regeneration and /or planting relevant native tree species within appropriate locations.

Table 5: Non-native Invasive Species

The forest district will concentrate management activity on the following list of species:

Non-native Invasive Species	Threat	Management response
Rhododendron *(Rhododendron ponticum & hybrids)*	Survey to identify location, quantify spread of plants to inform control.	Remove rhododendron as necessary and undertake follow up from FES estate.

3.4 Designations

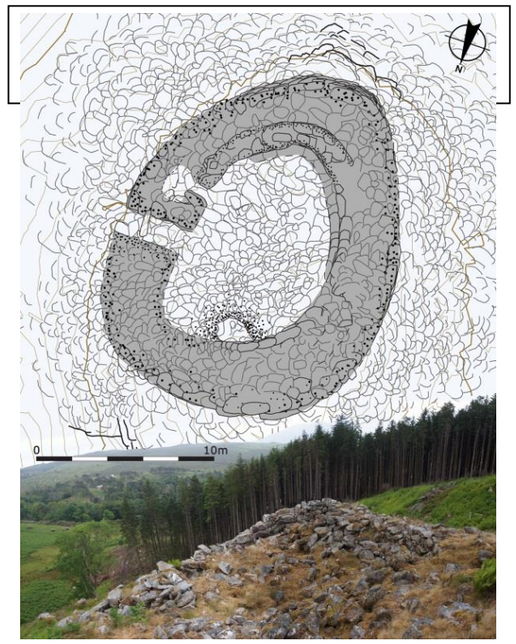
More than half of the Inverarish block is a designed landscape and as such the forest in this area will include specimen trees such as monkey puzzle, noble fir and alternative conifers. **Map 14** shows the area of the forest that is designated as a designed landscape.

Raasay House in the designed landscape setting. Temptation hill is behind the house to the left.

3.5 Heritage features

Dun Borodale

Dun Borodale is a well-preserved example of an Iron Age galleried dun. The dun measures 12.5m in diameter within a massive drystone wall c. 3.8m in thickness and in parts at least 2m in height. It is situated on a distinct knoll on the SE facing slopes of Borodale Wood, above the fertile slopes to either side of the Inverarish Burn. The dun is well preserved, with several stretches of wall courses visible both externally and internally. There is a scarcement ledge visible around the interior on the S side; and an entrance on the E. The entrance was deliberately placed at the lowest point on the knoll, acting to accentuate the impression of height (the wall elevation at this point may have been 9m above the entrance passage). The site has much archaeological potential, both in terms of buried occupation deposits and of structural evidence.



In character with many similar sites of the Inner Hebrides and southern mainland of the Atlantic region, the site is not perfectly circular, rather forming a sub-oval plan – and the site has tended to be considered a 'dun' rather than a true 'broch'. However, MacKie considered the site in his corpus of the brochs, wheelhouses and roundhouses of Atlantic Scotland (2007), paying particular attention to analysis of the structure and the reconstruction of the wall features. Mackie considered that Dun Borodale should be classed as a broch, 'though an oval one, ...the conjunction of a scarcement ledge, a doorway of appropriate design and signs of an intramural gallery on the wallhead above the scarcement would normally be quite sufficient to confirm its nature' (2007:845).

Dun Borodale is a scheduled monument (SM 12900; NG 554 363). Access to the dun is provided by a footpath. There is no onsite interpretation and access onto the dun is discouraged as the ruins are fragile and unstable. The site was recorded by terrestrial laser scanning in 2012 and is subject to a programme of conservation management, removing scrub vegetation and monitoring the structure for signs of accelerated decay.

The Raasay House cross slab

The Raasay Pictish cross-marked slab stands a little over 1.5m in height and features an incised ‘cross-of-arcs’ within a squared frame above a cusped shaft. Below the cross are two distinctive Pictish symbols: a horizontal ‘tuning fork’ symbol and a decorated crescent-and-V-rod. The slab was probably carved over 1300 years ago, in the 7th century AD, and is likely an early example of the Early Christian influence in Pictish carving. It is the most westerly Pictish symbol stone on record.

The cross slab is a scheduled monument (SM 2590; NG 546 367). Access to the slab is provided by a footpath from the modern road. There is no onsite interpretation but it was recently highlighted on the Historic Environment Scotland *Archaeology InSites* blog. The stone was recorded by terrestrial laser scanning in 2016 and is subject to a programme of conservation management, removing scrub vegetation and monitoring the condition of the carvings.

Inverarish Iron Ore Mines

The Inverarish Iron Ore Mines are situated at NG 564 365 (Mine #1) and NG 558 362 (Mine #2). The surviving remains comprise mine workings (surface and sub-surface), mine-head buildings, railways, kilns and associated harbour facilities. The extent of the monument means that it is only partially located on the national forest estate.

In May 1911 William Baird and Co Ltd, ironmasters of Coatbridge, bought the Isle of Raasay Estate to mine for iron ore. In 1914 the First World War broke out, just as the mine was ready to go into full production. Thirty-six men were called from Raasay to fight for their country, leaving no one to work the mine. The mine was as good as shut down before it even started. By 1916 the German submarine campaign was preventing iron ore getting to Britain from abroad. Iron and steel were desperately needed for the war effort. The government took over the mine, with Baird & Co still running it as agents. German Prisoners of War (PoWs) were brought to the island as the workforce for the mine.

The mine remains are currently the subject of a conservation management programme of condition monitoring and managed decay. There is a range of interpretation available and they feature prominently in the Raasay trail leaflet.

A **Heritage Impact Risk Assessment** will be drafted in late 2018, including formal fixed point photography in order to monitor condition. Unsafe buildings may require remedial action and / or access restrictions.

Mine Number 1 Buildings with interpretation panel

Raasay House

The gardens and landscapes of Raasay House are listed in the *Inventory of Gardens and Designed Landscapes* (GDL 321). The management and restructuring of the forest coupes and blocks that fall within the area of the *Inventory* listing – the 19th century parkland and plantation woodland, and those that affect its setting will be considered as part of this Land Management Plan.

Undesignated sites

There are a range of undesignated heritage features on Raasay. Two of interest were recently visited in Kennel Wood: the possible chambered cairn (at NG 556 366) and stone setting (at NG 550 366). Neither were thought to represent significant historic assets: the 'capstone' thought the indicate the presence of a chambered cairn is more likely to be a natural boulder that may have been quarried under to create a rudimentary shelter; while the stone setting probably represents a clamp of some kind. At Brochel, on the east coast, various heritage features associated with the well-preserved deserted township of Screapadal can be found within the forest.

3.6 Access and Recreation **– see Map 11 showing trails and visitor zones**

Recreation on Raasay is centred around a network of footpaths in two areas : Inverarish and Brochel. These walks are accompanied by an FCS walks guide publication entitled "Isle of Raasay" (Eilean Ratharsair)
https://scotland.forestry.gov.uk/images/pdf/rec_pdfs/RaasayLeaflet.pdf
The walks in Brochel forest link the road at Brochel Castle to the forest road which runs down to the abandoned township of Screapadal. This provides wild panoramas over the Inner Sound, over Rona and the Crowlin Islands to the Applecross Peninsula and the mainland.
In Inverarish the path network falls into three types:

- Firstly paths which are associated with the grounds of Raasay House: Temptation Hill, Orchard Wood (MacInnes Path) and Dun Borodale. These come from Raasay House and the village, linking to old tracks to the Church and to the broch; Dun Borodale (Scheduled Ancient Monument). These are regularly used by the Outdoor

Centre based in Raasay House, as well as visitors to the island.

- Next there are the paths associated with the workings of the Baird's iron mine, which operated around the time of the First World War, and closed in 1919. This mine was worked by German prisoners of war, and there are information panels provided at key locations to explain the working which can still be found. These workings are also scheduled ancient monuments (SAM).
- Lastly there are the hill access paths to Dun Caan. Since the construction of the new ferry terminal these use either the Burma Road, or the public road up to Number 1 mine (hill top mine) then the forest road and bridges to exit FCS land onto the hill towards Dun Caan.

The network extends along the old railway formations which link to the Baird's Pier southwest of Inverarish which is no longer in use. This used to form the most direct access to Dun Caan until the ferry terminal moved.
Raasay House Outdoor Centre use the forest for activities including cycling, walking and orienteering. They also use Loch a Mhuilinn for canoe and watersports tuition. Wildlife watching is popular with visitors to the island, and the forest environment here is host to Sea, and Golden Eagles and Otters amongst others.

4.0 Analysis and Concept

The analysis and concept map is a culmination of the analysis of the key features within the plan area, identified on **Map 2-Key Features** and displayed spatially on **Map 3 - Analysis and Concept**. The analysis has been considered with a focus on delivering IRS Forest District commitments towards the seven key themes of FES Corporate Plan 2017-2019.

5.0 Management Proposals

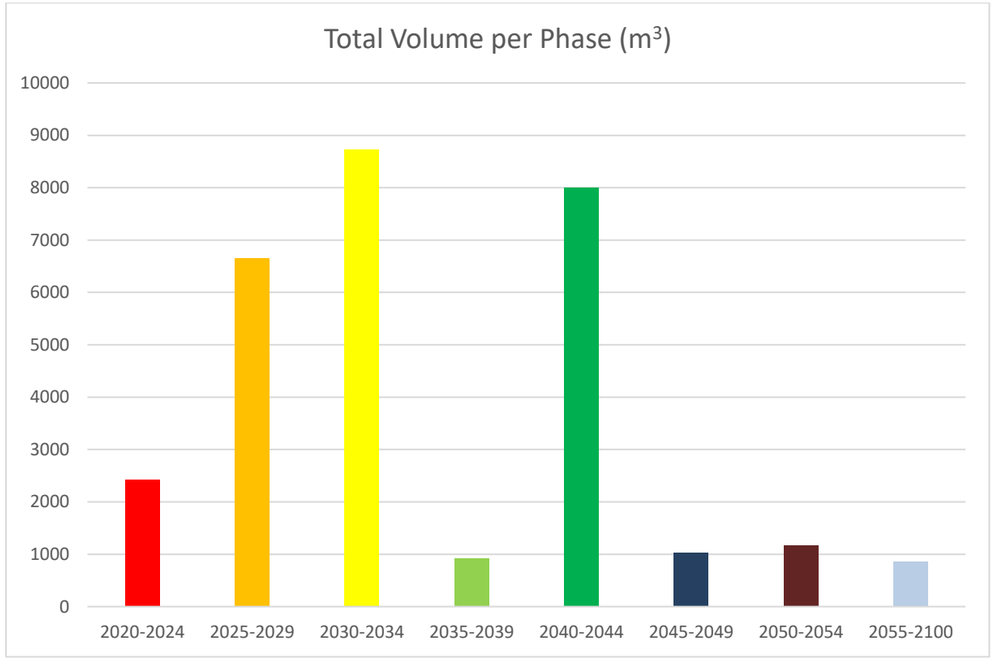
All of the operational management proposals are illustrated on **Map 5-Management** and **Map 6- Future habitat and species map**. The CSM6 maps **Map 15 & 16** provide a simplified spatial reference to all felling and establishment within the ten year period and refer to **Appendix 7: Summary of activities**. See **Appendix 14** for visualisations showing future felling and restocking from selected viewpoints.

5.1 Clearfelling and Restructuring

See Map 5- Management

Inverarish
The forest is quite even aged with 60% of the area over 60 years old. This has resulted in some windblow damage in the most exposed areas. Felling in the red phase will focus on removing the remaining larch in the forest and an area of Lodgepole pine that is heavily infected with Dothistroma needle blight. Felling in the orange phase will remove stands at greatest risk of windblow or where windblow damage has already occurred.

Brochel
There will be no felling in Brochel during the plan period. Non-native tree rege ation will however be felled to recycle to return this site to native tree species.



5.2 Thinning and Continuous Cover Systems (CCF)

Thinning

Due to the age structure and stocking of the forest, there will be no thinning undertaken in the 10 year plan period. There are 2 stands that would be at the correct stage to be thinned. These are Sitka spruce planted in 1994/95, both stands are however poorly stocked so have not reached suitable basal area to be thinned. The remaining mature stands will not be thinned as they are too late in the rotation and have not been thinned in the past so that thinning them would increase their instability and there would be no silvicultural benefit to yield or quality. The road network in Inverarish is good and therefore offers opportunities to thin stands in the future. The conifer and broadleaf mixtures that are indicated on the future habitat and species map will require thinning to remove all or part of the conifer component and release the broadleaves. This will provide an early harvest of firewood and produce better quality broadleaf trees in the future. **Map**

10- DAMS shows the exposure of each subcompartment. **Map 17 – thinning** shows the areas where DAMS is 16 or less and access allows thinning to be undertaken beyond the plan period.

There will be no thinning in Brochel which will be left to regenerate through natural processes and managed as Minimum Intervention.

CCF

There are two coupes allocated to CCF.

Coupe 20006 – This is planted groups of native broadleaves in tubes in 2015. As these trees mature small group fellings will be made to extract firewood volume. These gaps in the canopy will be large enough to allow pioneer species such as birch, rowan and willow to regenerate. Further gaps will be made to create a varied age structure over successive fellings. This will continue to provide hardwood firewood to local markets.

Coupe 20010- This area is mixed conifer and mixed broadleaves. There are some large specimen noble firs. This area will be managed through a group selection system to open up gaps in the canopy to allow mixed conifer and broadleaf regeneration. This will produce a varied age and species stand retaining some large specimen trees where safe to do.

5.3 Native Woodland Management

See Map 6a Future Habitat and Species map

Inverarish block will be planted with a mixture of native woodland and non-native conifers, this is in keeping with the designed landscape of this forest.

Brochel forest is mostly PAWS and as such natural regeneration of native broadleaves will be encouraged. Non-native regeneration will be felled to recycle.

5.4 Future Habitat and Species

The future habitat and species proposals are shown spatially on **Map 6a: Future habitat & Species**

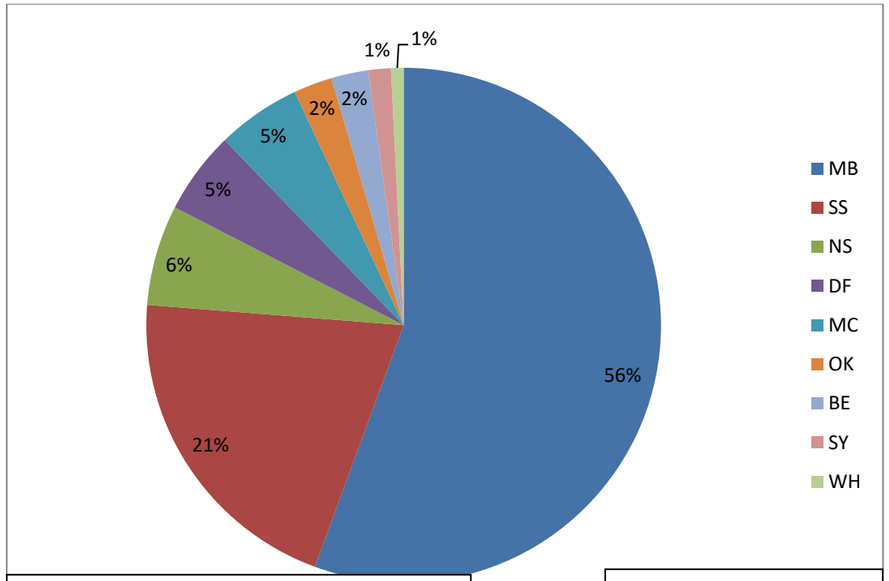
Inverarish will be restocked with a combination of natural regeneration and planting. A large proportion of restocking will be line mixtures, these will be used to provide resilience to future climate change and pests and diseases. Mixtures will be planted to allow thinning to favour the preferred species. The Norway spruce/ oak mixtures will allow a first thinning of conifers to provide firewood for use in the community and release the oak and create better quality stems. Where thinning is not possible mixtures will not be used.

Brochel will be restocked via natural regeneration of native broadleaves. This will be achieved by maintaining the perimeter deer fence and controlling deer and sheep in the forest.

The choice of species will depend upon the site and soil type and will be based around the prescriptions given in **Appendices 9 and 10: Management Prescriptions on the NFE.**

Coupe in the south of Inverarish- below the railway has been planted with Sitka spruce, above the railway is regenerating well with Sitka spruce, willow and birch. Deer control will encourage the natural regeneration to establish a mixed species stand.

The species distribution of the forest in 2050 is shown in the chart below. The Shannon Index is a measure of diversity, although this is lower than the current Shannon Index this is due to a large proportion of the future forest being allocated as Mixed Broadleaves which in itself is a diverse species mix.



Species % of Raasay Forest in 2050

Shannon Index 1.412

Exclosure in Brochel showing tree regeneration achievable once browsing has been eliminated.

5.5 Open Habitat Management

There are no designated open habitats within the forest, there is upland heath within the NFE on the edge of the forest, these will not be managed as open, if tree regeneration occurs in these areas it will not be removed. Open areas will be maintained around the SAMs to allow them to be viewed and protect the sites from damage.

5.6 Deadwood

A third of forest-dwelling species rely on dead or dying trees, logs, and branches for their survival (WWF, 2004). It is therefore of upmost importance for the conservation of bio-diversity that there is ample provision of deadwood habitat through our management. It is also acknowledged that enhancing deadwood provision is one the most cost effective ways to increase species richness on the National Forest Estate (Kortland, 2014)

The management of deadwood within the Land Management Plan area will be undertaken using the principles contained in the **Appendix 12 Deadwood Guidance**, Summary Guidance for FES (Kortland, 2014). Following a desk based analysis deadwood ecological potential (DEP) classes have been assigned to the Land Management Plan area as shown on **Map 8: Deadwood**

Ecological Potential. Table 2 in **Appendix 12** gives the management prescriptions for the low, medium and high categories.

The deadwood prescription for harvesting operations will be tailored to each site based on the areas DEP classification through the work plan process. This provides a flexible and more valuable way to meet the UKWAS target of an average of 20m^3 per hectare over the total forested area.

New riparian zones will be created and existing areas expanded. These areas will be managed using Minimum Intervention so that mature trees will die and produce a deadwood resource. Maintaining these across the forest provides a network of deadwood habitat throughout the forest.

5.7 Deer Management

Inverarish

There is a strategic deer fence that runs along the east boundary of the Inverarish block. Part of this is managed by FES; a section in the south east of the forest will have renewed posts in 2019/20. There have been breaches of this in the past and the deer usually find refuge in the forest. Shooting in Inverarish is difficult due to high recreation use. Night shooting under licence has also been undertaken. 1 deer was shot in 2016 and 10 were culled in 2017. The grid near mine no 1 is not deer proof. To overcome this, the area around the mine will be deer fenced and a gate installed at the first bridge, this will be a more economical solution than replacing the grid which is not well located as it fills up with run off form the county road. This will prevent deer access at this top entrance to the forest. Map 13a shows the deer cull and where deer management will be concentrated over the plan period.

Brochel

This forest has a perimeter deer fence that is deer proof. The fence goes down to the sea but there are opportunities for sheep and deer to get access along the coast. There have been incidents of gates being left open and sheep entering the site in the past. The deer cull was 8 shot in 2016 and none in 2017. The current deer population is low, approximately 2 per 100ha. The deer culling in Brochel will to seek to maintain populations at this level over the next 10 years to allow the natural regeneration to establish. Map 13b – shows the deer cull of Brochel in the past.

5.8 Recreation

We will review the visitor experience planning for Raasay (including the 2010 Touchstone plan) in close consultation with the community. As part of this, review the waymarked path network as part of the national trail portfolio analysis. Improve access around Home Loch with a new path, delivered in partnership with community. During restocking operations around the archaeology, the ground preparation machine will scrape rough paths to points of interest where this is reasonably possible. The interpretation panels at the mines will be maintained.

5.9 Heritage Management

The National Forest Estate on Raasay includes several significant historic assets: Dun Borodale, an Iron Age dun; the Raasay House cross slab, a Pictish carved stone dating from the 7th century AD; elements of the Raasay House parklands and woodlands, dating from the 19th century; and elements of Inverarish Iron Ore Mines, dating from the 20th century.

Our key priorities for archaeology and the historic environment are to undertake conservation management, condition monitoring and archaeological recording at significant historic assets; and to seek opportunities to work in partnership to help to deliver *Our Place in Time: the historic environment strategy for Scotland* (2014) and *Scotland's Archaeology Strategy* (2015). Significant archaeological sites will be protected and managed following the *UK Forestry Standard* (2017) and the FCS policy document *Scotland's Woodlands and the Historic Environment* (2008). Harvesting coupes, access roads and fence lines will be surveyed prior to any work being undertaken in order to ensure that upstanding historic environment features can be marked and avoided. At establishment and restocking, work prescriptions remove relevant historic environment features from ground disturbing operations and replanting. Where appropriate, significant historic assets are recorded by archaeological measured survey, see active conservation management and may be presented to the public with interpretation panels and access paths. Opportunities to enhance the setting of important sites and landscapes will be considered on a case-by-case basis (such as the views to and from a significant designated site).

The *Regional Historic Asset Management Plan* includes conservation management intentions for designated historic assets on the National Forest Estate. Details of all known historic environment features are held within the *Forester Web Heritage Data* and included within work plans for specific operations to ensure damage is avoided. Significant historic environment features will be depicted on all relevant operational maps.

The designed landscape (see **Map 14- Designed Landscape**) will be reflected in the tree species that are replanted. This will include specimen trees such as Noble fir, Douglas fir, Pacific silver fir and monkey puzzle. Open rides will be left between coupes to create views

and small felling coupes. Dun Borodale will be kept open and low growing broadleaves planted in front of it to maintain the view out to sea.

Mine number 2 will have the mine entrance covered with a metal grid to prevent access in to the mine by the public. There will also be fencing and signs around the mine to warn public that the walls are unsafe and may collapse.

Objective	Opportunities	Constraints	Concept
Caring for the Historic Environment	We will ensure positive conservation management at significant historic assets, undertaking scrub control, condition monitoring and archaeological recording where necessary.	We will undertake suitable work practices on operational sites with known historic assets (and those discovered during operations).	We will ensure that historic assets (both designated and un-designated) are included within our land management and operational plans and are managed in line with *UK Forestry Standard*.

5.10 Infrastructure (roads, quarries and bridges)

To access the coupes in the red and orange phase a new forest road will be required. This will extend the existing Burma road south to join the county road. This is shown on **Map 19- new roadline.** A quarry will not be required as stone will be used in the location of the new road. This road may be constructed to carry forwarders rather than timber wagons and therefore may be built to a lower specification with less rock required and a lower impact.

5.11 Natural Hazards

The west face of Temptation Hill has been identified as a potential for slope instability **Map 7** shows the area at risk. This was noticed after it had been clearfelled in 2015, please see **Appendix 13** which shows the geotechnical report on this. It has been identified as low to moderate risk to road users and workers on site. This site will be restocked in 2020 which will increase the stability of the site.

Map 7 – Natural Hazards shows the areas at risk of flooding from 10, 200 and 1000 year floods. The only area that is at risk of flooding is the area around Inverarish village where the Inverarish burn reaches the sea. As mentioned in section 3.1 there has been flooding in the past in this area. To prevent flooding of this area the Inverarish burn will be maintained clear of debris to prevent blockages and subsequent flooding.

5.12 Felling Trees in Exceptional Circumstances

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 40 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