Strategic Plan for Scotland's NFL in North Argyll

Appendices

Contents

Appendices

1. Location, setting and context

The six forest blocks are located in the northern part of the historic county of Argyllshire, across an area of 9,697 ha stretching from Loch Leven in the North to Loch Creran in the South and from Glencoe and Glen Creran in the East to the shores of Loch Linnhe in the West. *See Location Map 1.*

Block no.	Block name	Area (ha)	% of combined land holding	Acquisition / (disposal) dates
44	Brecklet	540	6	30/04/1962 (0.06 ha 1999, 0.24 ha 2008, 0.17 ha 2015)
42	Glenachulish	1121	11.5	13/04/1921- West section - and 03/10/1927 (0.5 ha 2001, 0.02 ha 2007, 0.04 ha 2008, 0.02 ha 2009 and 0.26 ha 2015)
40	Duror	3,113	32	13/04/1921 – North section; 10/02/1959; 04/11/1965 – open ground to South; 11/11/1967; 26/11/1968 and 14/10/1979 Lagnaha – 05/11/2015 (0.13 ha 2009, 0.09 ha 2013)
45	Bealach	1,800	18.5	07/11/1960; 26/11/1968; 03/07 and 29/07 1974; 09/09/1975; 14/10/1979 (0.12 ha 2009)
46	Appin	645	7	07/11/1960 (0.1 ha and 0.26 ha 2001, 0.08 ha 2002 and 54.19 ha 2020)
44	Creran	2,478	25	22/01/1962 – North; 04/11/1965 and 09/05/1968 – South (134.03 ha and 0.72 ha 2016)

The locality is defined by seascapes and rugged or mountainous country inland. The land holding comprises hills (including two Munros) and five glens, orientated North, South and West facing, draining to coastal waters of significant importance, many with international designations. Four of the blocks have coastal frontage and five have rivers that drain directly into coastal waters. Surrounding land use is sporting estates, upland livestock farms and private sector forests. There are active fin fish and shell fisheries in the surrounding lochs.

The individual forests are linked by large extents of open land as well as the road (A828) which is the main link between Oban and Fort William and is a key route for travellers to North Lorn from the central belt. The forested areas in Bealach and Duror are contiguous and planned woodland expansion will eventually link native woodland habitat from Appin to Bealach. Duror and Glenachulish forests also link, through a strip of land in the coastal fringe that extends south

from Glenachulish almost to the Duror forested area as well as Lagnaha, which lies between Glenachulish and Duror forests and is a relatively recent acquisition. Lagnaha comprises largely open ground and has been incorporated into the Duror block. Its management will be covered by the Duror LMP at its next revision. Opportunities exist to develop native woodland across some of this open ground, potentially linking native woodland in Glenachulish and Duror. *(See Map 2: Overall Context and Map 3: Concept).*

The proposal is to rationalise the individual LMPs over the next few years, synchronising approvals timelines where required and potentially including one LMP covering both Bealach and Duror, and possibly Appin, as the forested areas are contiguous and require integrated management.

2. Description

Social

Approximately 2,000 people reside in, and adjacent to, the NFL forests in this vicinity, in the settlements of Glencoe, Ballachulish, Kentallen, Duror, Appin and Glen Creran. The populations swell in summer with resident and transient tourists and the A828 and the A82, which it joins at Ballachulish, bring many travellers through the area. Visual amenity is particularly important for the forests that lie close to these arteries, i.e. Brecklet, Glenachulish, Appin and part of Duror forest (Lagnaha) although the forests are also highly visible from the high slopes and mountain tops, which includes two Munros.

The forests are used, to varying degrees, by local communities and tourists:
Brecklet – has two core paths, linking to the Glencoe Orbital Route and the Oban to Glencoe Sustrans Route; the NTS Visitor Centre and campsite is located on the NE side of the forest and the surrounding woodlands and trails are popular with walkers and cyclists.
Glenachulish – walkers accessing the Munros and Fraochaidh (three hill paths, including one at St John's entrance); canyoning; canoeing (from the lower reaches of the River Laroch); informal mountain / trail biking; forest walks and visitors to the Murder Cairn
Duror – forest walks; the core path from Duror – Ballachulish – Glen Creran; Sustrans cycle/ all ability access trail at the edge of the forest
Bealach – cavers exploring the network of caves, including the deepest pot-hole in Scotland; local walkers and mountaineers accessing Fraochaidh
Appin – local residents
Glen Creran – people using the woodland trails; walkers accessing Fraochaidh and the Right of Way to Glenachulish; people attracted by the adjacent Glasdrum National Nature Reserve (NNR).

Mountain and trail biking has increased in popularity in recent years and in several of the forests, multiple non-formal trails have been created spontaneously by a growing number of users. Many of these are simply desire lines but on occasion some form of ad-hoc management or infrastructure has been implemented without permission, including cutting tree branches, installation of pallet bridges or cutting tracks into the hillside. These interventions are potentially hazardous and not approved, so FLS has a policy to remove these as soon as they are

found. FLS aims to work with representative groups to ensure that trail bike activity is compatible with forest design and management operations.

Over a number of years there has been an increase in the numbers of people parking camper vans / motor homes or pitching tents on FLS ground in the wider area. This is different to the so called "wild camping" that involves hiking in hills and remote areas and camping for the night en-route. Camping has been noted in car parks, on road-sides and in riparian zones. Frequently, human waste and litter are left behind; campfires bring fire risks and cause damage and dead wood is collected and trees damaged to provide firewood. To date, the North Argyll group of forests had experienced fewer problems compared to the more iconic sites such as Glen Nevis. However, during the Covid pandemic the problem has become widespread and this type of use has been seen in the North Argyll forests area. Careful preparation and adequate resources will be required to address this issue and limit potential impacts on the forests, on sensitive habitats and local communities.

Environmental

The area is covered by a large number of international and UK designations, associated with both large land expanses and with specific sites. The Glen Etive and Glen Fyne SPA is common to all forests apart from Appin, as this covers virtually all of the open ground that links the forests, most of which is in the NFL estate. Other geographically large-scale designations are the Ben Nevis and Glencoe National Scenic Area (NSA), which includes Brecklet, Glenachulish and part of Creran forests; the Lynn of Lorn NSA (the NE boundary of which is adjacent to Appin forest) and the Loch Etive Mountains Wild Land, which includes part of the hill ground above the Creran forest. Within these areas, various priority habitats and features may potentially be affected by forestry operations.

The number of designations and key linkages between forests are drivers for taking a strategic approach to the management of NFL forests in the area.

Key designations *(see Map 4):*

Designation	Detail
SPA	*Glen Etive and Glen Fyne SPA (designated for Golden eagles)*
SAC	*Creran Woods SAC (approx. 444.28 ha);* *Loch Creran marine SAC (River Creran runs through Glen Creran forest and feeds into loch);* *Onich to Ballachulish SAC woodland sits North of Glenachulish forest*
NSA	*Ben Nevis and Glencoe National Scenic Area – Glenachulish and Brecklet forests and some open ground and part of Glen Creran open ground lie within the NSA;* *Appin forest lies adjacent to the Lynn of Lorn NSA*
SSSI	*Kentallen SSSI (9.74ha) and St Johns Church SSSI (2.3ha) – geological – close to Gle* *nachulish;* *Carnach Wood (84ha) – biological SSSI lies adjacent to Brecklet;*

Designation	Detail
	Creran Woods SSSI (109 ha and 508 ha) cover part of Creran forest
NNR	*Glasdrum NNR (168ha) adjacent to part of Creran forest;* *Glencoe NNR (5625 ha) is adjacent to Brecklet*
Wild Land	*Loch Etive Mountains Wild Land – includes part of hill ground in Creran*
Shellfish Waters	*Loch Leven, Loch Linnhe (parts), Loch Creran*
DMG	*Blackmount Deer Management Group – all blocks apart from Appin are covered by this DMG*

The FLS land here supports large areas of Ancient Semi-Natural Woodland (ASNW) and long established woodland of semi-natural origin, as well as significant areas of Plantations on Ancient Woodland Sites (PAWS) which FLS has a policy nationally to restore 85% to native woodland *(see Map 5: ASNW & PAWS)*.
The entire Strategic Plan area lies within Scotland's rainforest zone; ASNW and native woodland in this area forms part of Scotland's temperate rainforest, a unique forest habitat rich in lichens, bryophytes and other species dependent on the mild, wet climate and clean air *(see Appendix 8 for more information).*

The most significant area of ASNW is in Creran (approximately 375 ha) most of which is designated as SSSI and SAC. Glenachulish supports the largest area of PAWS (approximately 301 ha) and around 22 ha of semi-natural woodland, some of which is ASNW. Appin supports about 183 ha of PAWS, as well as more than 40 ha of native woodland, most of which is thought to be ancient in origin. There is around 100 ha of PAWS in Duror, as well as more than 34 ha of semi-natural woodland in the recently acquired agricultural ground at Lagnaha, which shows potential for woodland expansion as grazing and browsing pressure is reduced.

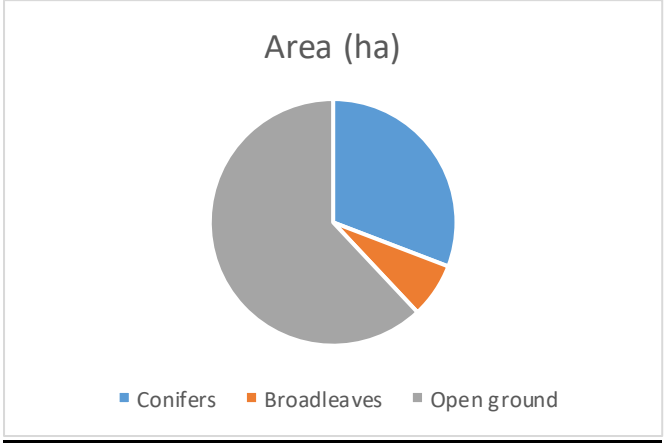
Much of the PAWS in these forests are medium quality, there is evidence of ancient woodland remnants and pockets of veteran trees along gullies, outcrops etc. However, Glenachulish contains many Ancient Semi-Natural Woodland remnants and associated plant communities along burns and on upper slopes above the plantation forestry. These sites are often on steep, sometimes unstable, slopes; on fairly nutrient poor or wet ground; they are vulnerable to deer browsing and in some places there is extensive existing, or potential, natural regeneration of non- native species, including invasive species, into felled or open areas. These factors pose challenges in restoring PAWS and for technical, practical and economic reasons, it may not be possible to restore all of these sites immediately. It will therefore be necessary to prioritise the restoration programme, taking into account environmental and ecological issues and making decisions on the best way forward for each site.

Invasive Non-Native Species (INNS) present challenges across all the forests to varying degrees. Rhododendron has formed extensive canopy in parts of some forests, such as Appin, where it is found on the open hill as well as in wooded areas. Felled coupes in the southern part of the forest are also under threat from Rhododendron spreading from neighbouring ground. A partnership project underway to remove Rhododendron the Creran native woodland SSSI /SAC

has had success but ongoing work is required to combat regeneration, which includes plants found on hillsides in the Coires. Rhododendron has spread into parts of Glenachulish, establishing in clear fell sites and posing a threat to existing native woodland and a challenge for PAWS restoration. Western hemlock is spreading from mature trees within and adjacent to some of the forests. In PAWS and sensitive sites, the priority will be to remove seed sources and clean any young regenerating trees from the stands. Where Western hemlock trees are remote from any ASNW, PAWS or sensitive sites, the priority will be to remove them at the earliest opportunity when the coupe is felled, or to thin them out to favour preferred species in areas managed for Continuous Cover Forestry.

Five of the forests are associated with rivers: the Laroch and the Creran rivers run along the boundaries of Brecklet and Creran forests; the Abhain Greadhain, Duror and Salachan rivers run through the middle of the Glenachulish, Duror and Bealach forests respectively. All the rivers support Salmonid species and drain into coastal waters of national importance. The Creran River drains into Loch Creran, which is designated as a marine SAC for its unique assemblage of bedrock and biogenic reefs. Forestry activities must avoid any potential negative impacts on qualifying features. SEPA flood maps indicate a potential flood risk where the River Laroch runs through Ballachulish and drains into Loch Leven and a lesser risk where the Abhain Greadhain meets Loch Leven close to the Ballachulish Bridge. Forest management planning will take account of catchment sensitivity and the potential impact of forest operations to contribute to the mitigation of risk.

62% of the land holding is open ground (mostly hill ground) in contrast to Scotland's National Forest and Land estate as a whole, which comprises 33% open ground. This land links the forests and includes various open priority habitats, including calcareous grassland, wet flushes, bog pools and blanket bog. An open habitat management plan has been prepared specifically for the open hill ground. This plan will not be part of the statutory process, so open land will also be included in the LMPs for each forest, focusing most on elements where forestry impacts on the open ground, such as forest edge treatments and woodland expansion.



<u>Priority habitats include:</u>

Western acidic oak woodlands
Mixed woodland on base – rich soils associated with rocky slopes
Upland birch woodland
Montane scrub

Montane heath
Calcareous grassland
Blanket bog
Basic flushes and bog pools
Rivers / riparian woodland

Priority species include:

Golden eagle
Black grouse
Red squirrel
Juniper
Pearl bordered fritillary
Chequered skipper
Sea eagle (White tailed eagle)
Otter
Wood ants

Currently, a fairly small area is recorded as native woodland habitat (398 ha - 4%) but there is a much larger area (747 ha, 8%) under native trees and it is likely that this habitat area has been under - recorded. Scope exists to expand the proportion of native woodland present, through restoration of PAWS and through expansion of native woodland in riparian zones, on upper slopes closer to the natural tree line, and elsewhere.

Proportion of habitat types and species composition:

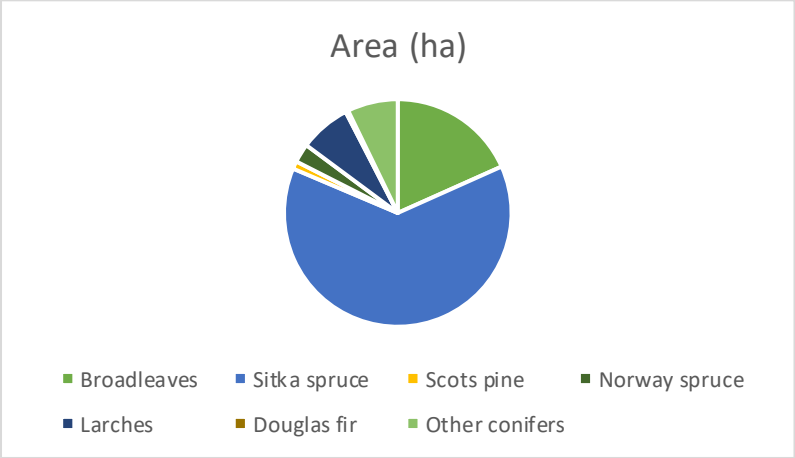
Habitat Type	Area - ha (%)	Habitats Designated Sites Area (SSSI/SAC) – ha (%)	Species Designated Sites Area (SPA) – ha (%)
Open habitat*	5632 (58%)	92 (0.9%)	3821 (39%)
Native woodland**	398 (4%)** (791)	273 (3%)	19 (0.2%)
Native tree species***	747 (8%)	231 (2%)	38 (0.4%)
Broadleaves	713 (7%)	240 (2%)	35 (0.4%)
Commercial conifer	2941 (30%)	28 (0.3%)	69 (0.7%)
Sitka spruce	2229 (23%)	17 (0.07%)	59 (0.6%)
Norway Spruce	93 (1%)	7 (0.07%)	0.01 (0)
Larch	272 (3%)	2 (0.02%)	9 (0.1%)
Scots pine	39 (0.4%)	0	0
Mixed Conifers	26 (0.3%)	0.65 (0.0%)	2 (0.02%)

** Open habitat, excludes non habitat types of open ground such as roads etc.*
*** Native woodland habitat is likely under-recorded as there is a further 393 ha recorded as broadleaved; mixed / yew woodlands that may actually comprise native woodland*
**** Native tree species likely under- recorded as there is a further 197 ha recorded as mixed BLs that may be predominantly native species*

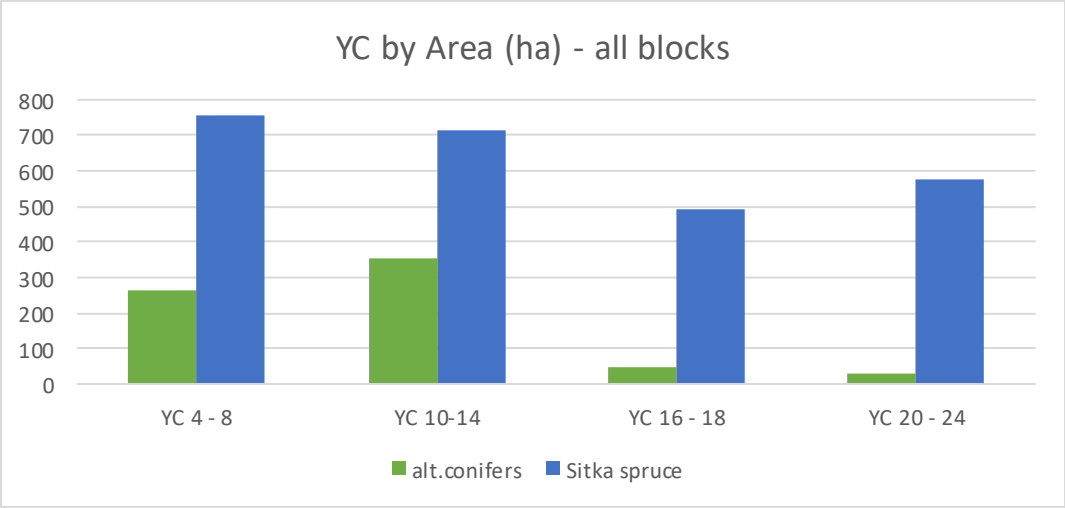
Economics

Deer control (both fencing and culling) will be a business critical requirement to enable successful establishment of commercial stands (conifers and broadleaves) as well as restoration of PAWS and expansion of other native woodland areas. FLS participates in the Blackmount Deer Management Group, which covers all the forest blocks apart from Appin.

Species:
Of the forested ground, 81% is under conifers, predominantly Sitka Spruce and 19% broadleaves

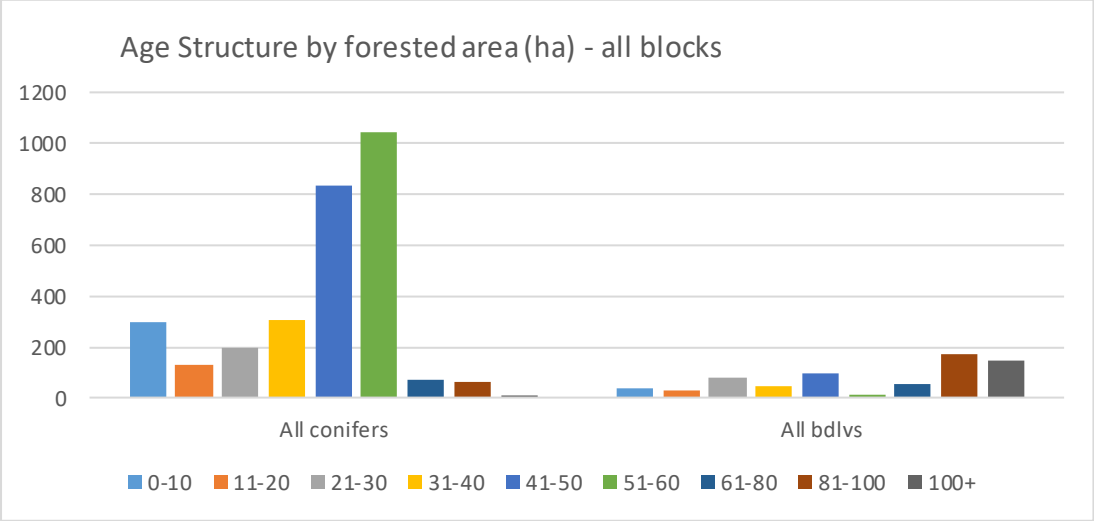


Yield Class:
Average Yield Classes (all conifers) are 13 -14 but there is significant variation across the area and within forests. Around 21% of the conifer area is YC 20 or above, while 25% is YC 8 or below.

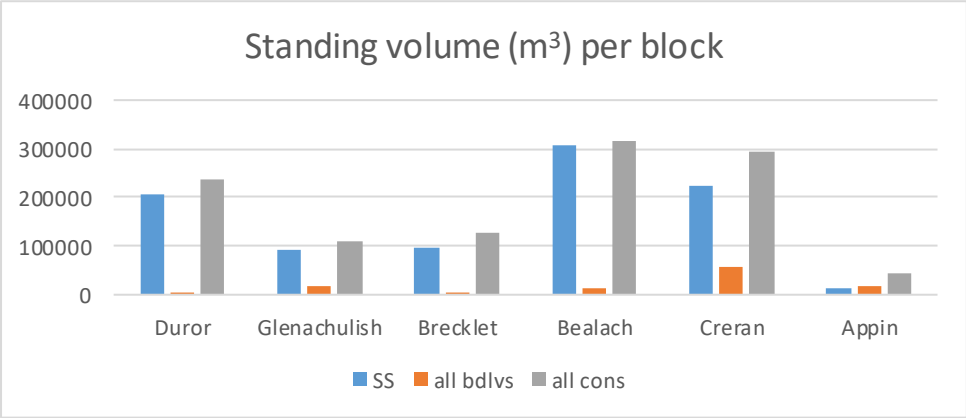


Age structure:

The 40 – 60 year age classes predominate, so addressing diversity in terms of age structure as well as species, will be a priority, although this will be achieved over a long time period.



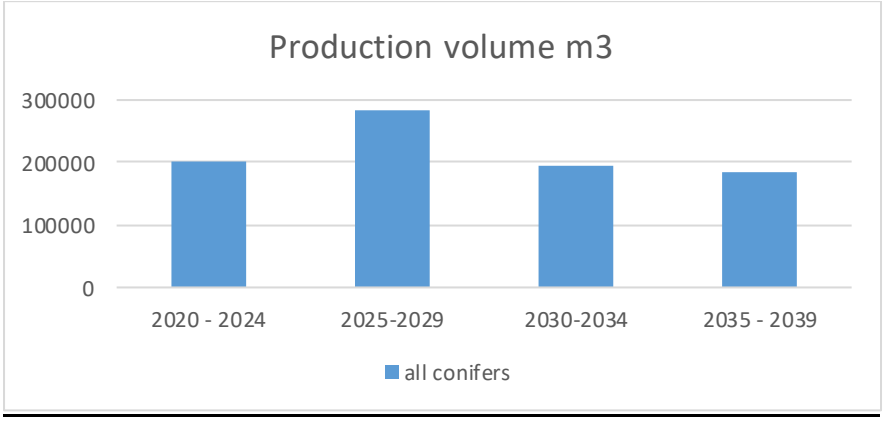
Standing volume:
Current standing volume across all forests is 1.28M m^3, dominated by conifers (1.16M m^3) and by the larger forests.



The current potential volume production per hectare indicates that the smaller forests are potentially very productive, possibly due to better growing conditions and because conifer production is focused on the better ground in these forests. Current standing volume per ha for each forest:

	All conifers m^3/ha	SS m^3/ha
Duror	353	355
Glenachulish	334	363
Brecklet	522	557
Bealach	472	548
Creran	475	539
Appin	489	517

Production volume:
Estimated volume production (m^3 /year overbark standing) – based on current Land Management Plans – shows production peaking in 2025-2029, indicating the predominance of mature conifer crops across these forests:



There is approximately 255 ha of larch across the forests (calculated by component) but a larger area would need to be felled to access the larch. Two of the forests (Glenachulish and Appin) have been subject to Statutory Plant Health Notices (SPHN) for Phytophthora ramorum on Rhododendron, which required associated larch in the vicinity to also be removed. Following the FLS Larch Strategy, plans will be prepared for the management of larch across the forests, to remove larch early in the felling programme where this is viable economically and practically, focusing first on mature (35+ years) crops. Also, by planning and constructing access to larch trees so that they can be felled quickly if necessary, with a focus on the areas most at risk, and by preparing detailed work plans for coupes that are most complex or sensitive and would be costly and difficult to fell quickly in the event of infection.

Roads:
Between 13 km and 16 km of roads construction is potentially required to harvest the current standing timber, depending on final routes and road lines, 75% of which are in Bealach, with 16% in Brecklet, 7% in Creran and 3 % in Duror. Existing roads in Glenachulish require upgrade, although some of these will not be suitable for improvement due to steepness and slope stability. Opportunities to minimise the length of new / upgraded roads required, through use of forwarder tracks and appropriate equipment, will be reviewed.

The rugged terrain creates significant challenges in all the forests – across virtually the whole forest in some cases and specific parts of the forest in others. Steep and sometimes unstable slopes dominate in Glenachulish and create difficult working conditions for road construction and maintenance, harvesting and restocking. The Appin landform is a series of ledges and ridges that create access issues and obstacles for safe working. All the forests currently require an element of steep ground working and they are bi-sected by large numbers of watercourses and gullies, which are difficult and costly to cross with machinery. Many of the watercourses have features such as veteran broadleaved trees or rare bryophytes that must be protected during operations. Large areas of bog or wet ground involve environmental, economic, technical or safety implications.

Deer pressure, livestock incursion and fencing:
See Appendix 10: Deer Management Plan and Maps 7a – 7e: Deer Management).
Large numbers of deer moving between the forests and open ground create high levels of grazing and browsing pressure on young planted and naturally regenerating trees, also potentially impacting some priority open ground habitats. The strategic deer fence that runs from Brecklet in the North, down to the south-eastern boundary of Glen Creran requires ongoing maintenance and will need to be replaced in the near future. A case may be made for extending the fence further South as well as re-alignment to take in more of the open ground up to the FLS boundary. Recent breaches in the fence at Creran have led to increased deer incursion onto FLS land, although the fence has since been repaired. While this fence helps to facilitate deer management across a wide range, intensive deer control is still required, to achieve sustainable population levels that allow successful tree restocking and native woodland expansion.

Within the strategic deer fence, deer culling may need to be complemented by carefully located and designed exclosure deer fencing in specific locations. In Creran for example, deer fencing may be required to protect native woodland development and expansion as well as commercial restocking. In Glenachulish, there may be benefits in deer fencing some felled coupes, to enable development of native tree seed sources that help promote natural regeneration and therefore PAWS restoration, in surrounding areas.

Livestock grazing occurs across the North Argyll FLS land to varying degrees, as occasional incursion into forests from neighbouring land or as regular grazing on open hill ground where the FLS boundary with neighbouring properties is unfenced. In some places, particularly Glenachulish, livestock movement within the forest has been more extensive and there is evidence of high grazing and browsing pressure.

In Appin forest, a deer proof fence will be constructed along the march boundary, the fence line dropping down through Bealach and tying–in at the Salachan River. In Glenachulish and Lagnaha, a new livestock fence will be constructed as close to the march boundary as possible on this steep terrain, the route also taking cognisance of impacts on landscape and priority species.

Further requirements for livestock and deer fencing across the area will be reviewed and a fencing plan prepared and implemented, to ensure that young restock and woodland expansion projects establish successfully. This may include, eventually, an extension of the deer fence at Appin, taking it along the Bealach march boundary and tying-in to the strategic deer fence at Creran. The need for this fence will be determined if browsing pressure is not reduced to sustainable levels following increased deer culls.

3. LMP timetable for the individual forest blocks

Bealach – approved and active
Duror – current approval expires 31/03/2024
Lagnaha – included in Duror LMP area but not covered by the current LMP; in the interim prior to LMP review, management will be covered by the Strategic Plan process and any submissions for woodland creation approvals
Creran and Appin – recently approved
Glenachulish – currently in preparation, current approval expires 31/03/2024
Brecklet – current approval expires 23/10/2027

4. Strategic priorities for the North Argyll forest area

Strategic Plan Priorities

The forests are linked by a large expanse of open hill that creates 9,760 ha of contiguous land under FLS management. Taking a strategic approach will co-ordinate management across the forests and enable effective use of resources to achieve agreed objectives. The Strategic Plan will address key themes and issues, or outline aspects of management that are common to, or cover, several or all of these linked forests.

Deer management:
Deer management needs to be planned across the whole area, to minimise grazing / browsing pressure to levels that enable successful establishment of trees through natural regeneration and planting. Deer cover a huge range and deer control in one forest block may have repercussions for deer activity in other blocks, so it is important to take an overview approach that factors in deer movement and behaviour across all blocks, as well as working closely with neighbours and the Deer Management Group. Taking this approach also factors cognisance of features that are particularly vulnerable to deer pressure, such as native broadleaved woodland restoration or some priority open habitats. *Map 7 a. shows planned restocking and woodland expansion areas over the next 10 years and other features vulnerable to deer pressure.*

A Deer Management Plan (DMP) has been prepared at a strategic level, to provide a bridge between individual Land Management Plans and the wider plan agreed by the Deer Management Group *(see Appendix 10).* This DMP will be reviewed again, should more resources become available and taking into consideration the wider deer management issues across West Region.

Consideration will be given to extending the strategic deer fence along the southern boundary at Glen Creran, possibly eventually linking to Bealach; fencing large-scale areas for woodland expansion at Creran and Appin; livestock fencing and limited use of deer fence exclosures at Glenachulish.

Woodland expansion:
Expansion of the total forested area will primarily be achieved through natural regeneration of native broadleaved species along gullies and on upper slopes, allowing expansion closer to the natural tree line. Also, significant areas of new native woodland creation in some of the forest blocks. Some planting may be required where there are no suitable seed sources. Native species of local provenance will be used in these situations. Potential areas identified for significant native woodland expansion include gullies and upper slopes in Glen Creran; the coastal facing strip between NW Appin and SW Bealach; at Lagnaha, between Duror and Glenachulish - with some small areas of expansion in other forests. Eventually, new and existing native woodland areas; broadleaved riparian zones and native woodland corridors will create continuous native woodland habitat between Glenachulish and Appin.

Priority open habitats:

The large expanse of open ground supports a range of priority habitats under different levels of sensitivity, vulnerability or threat. An overview approach is required to select management options for key sites, to protect important open habitats and to identify areas where woodland expansion would be appropriate and develop suitable approaches for promoting tree colonisation in these areas. A separate open habitat management plan has been prepared, to underpin the Strategic Plan – *see Appendix 11 – Open Habitats and Woodland Expansion Report.*

PAW restoration / ASNW:
While plans for restoration of PAWS sites need to be prepared for each forest as part of the Land Management Plan process, a strategic approach can be taken insofar as to deploy available resources to maximum effect across the forests, prioritising sites of highest ecological value or those under particular threat first, then identifying appropriate timeframes for medium to low quality sites that are subject to identified challenges. It won't be possible to implement PAWS restoration on all sites in one go and browsing pressures must be reduced before successful establishment of young planted or naturally regenerating trees can be achieved. *See Map 5: ASNW and PAWS and Map 8: Priorities/management zones.*

Productive forestry - extent of conifers vs broadleaves:
Although it will be addressed primarily across West Region as a whole, there is opportunity to take a wider perspective on volume production and operational activity across this linked group of forests, to optimise sustainable timber production and improve resilience through felling, restocking and other management. It may be possible to focus production activity on the most appropriate sites while pulling back from operationally suboptimal and difficult areas - to maintain, or even increase, overall production levels. Cost/benefit can optimise while improving safety and enhancing environmental features. Benefits include ecosystem services, including carbon storage and biodiversity. Resilience can be improved through selecting a diversity of site- suitable species for a changing climate and by having plans in place to address potential tree pests and diseases. Broadleaves and, where appropriate, native conifers, will be promoted on suitable sites so that the proportion of broadleaved species increases across the area. *See map 8: Priorities/management zones*

Productive broadleaves:
Effort will be made to grow some productive broadleaves where practical and where conditions are suitable. These will be grown under Continuous Cover Forestry, only where management can commence early in the stand development for optimal top height and DBH and where access is sufficient for safe and effective management operations. Areas managed for productive broadleaves may include PAWS restoration areas where ecological value is fairly low and management operations would not have a detrimental effect on any priority species.

Forestry on steep ground:
Much of the land- holding in this area is on steep ground, which provides additional challenges for felling, extraction and restocking as well as creating and maintaining the necessary access provision. However, much of the steep ground has produced excellent timber and steepness in itself need not preclude further restocking, provided that it is safe to do so. But some of the steep areas are highly visible in the landscape, or they are PAWS

or lie adjacent to native woodland or other priority habitat / species, or the slopes may be unstable and at risk of landslip or rock fall. In these cases, it is more appropriate to contract commercial forestry away from these areas to focus effort on productive ground that is more cost effective for commercial crops. In the short to medium term, felling coupes may create adjacency issues and higher landscape impact in some places, until difficult areas have been harvested and restocked.

Community and visitors; recreation provision:
Further opportunities exist to plan and manage recreational provision, to accommodate an anticipated increase in visitor numbers to the forests and land in this area, integrating visitor use with timber production and other benefits but avoiding sensitive or vulnerable habitats.
Forest design will take account of desire lines and the range of needs of users of the forest, as far as is practicable. These are working forests and public access must be compatible with safe and sustainable forestry. Liaison will be required with representative groups, for example of trail bikes, to ensure that coupe design minimises any potential conflicts and that user activities complement with management operations.

5. Analysis (including issues, constraints etc. common to the forest blocks)

Issues

Pests / disease – management and resilience

- Deer incursion from neighbouring sporting estates and agricultural ground – high deer pressure in places. Use of strategic deer fence and deer control; potential for limited exclosure fencing for strategic purposes
- Livestock incursion from neighbouring ground
- Rhododendron on forest estate and neighbouring ground – Phytophthora risk
- Tree health – extent of larch through forest blocks; spread of other tree diseases, e.g. Dothistroma Needle Blight (DNB) on Scots pine, Chalara on ash - impacting species choices

Management Objective	Opportunity	Constraint	Concept
Reduce grazing / browsing pressure by deer & livestock, to protect young growing trees.	Promote natural regeneration & protect young growing trees to achieve successful restocking & woodland expansion. Increase proportion of broadleaves & alternative conifer species in the forest.	Existing high level of deer damage, limiting establishment of all tree & shrub species, including Sitka spruce. Extensive deer range, with deer incursion from all sides but especially from neighbouring estate to the East. Strategic deer fence in place but sections are now outwith NFL. Fence was previously breached; now repaired but	Increase cull figures; reduce deer numbers on FLS land. Focus deer control effort to protect newly planted & regenerating trees, as well as reducing numbers overall. Liaise with neighbours to ensure effective maintenance of strategic deer fence. Consider extension of strategic deer fence.

Management Objective	Opportunity	Constraint	Concept
		there are ongoing maintenance implications. Strategic fence only extends to SE part of Creran forest. Opportunity for deer to move around this although this may be limited. High resource requirement to achieve level of deer control that is needed. Requires co-ordination with neighbours. Livestock incursion from neighbouring ground; hefting onto FLS ground	Construct exclosure fences in identified locations within forest blocks to promote natural regeneration & create BL seed sources. Construct new fences along march boundaries at Appin (deer) & Duror/Glenachulish (livestock).
Manage tree health – to reduce impact on operational areas.	Carry out pre-emptive felling of larch where possible, when adjacent coupes are felled or road construction improves access. Plan to remove 20% of larch present and all mature larch (35+ years) within 5 years. Use national SPHN GIS layer to monitor potential spread from land outwith NFE.	Larch and Rhododendron often located in places that are difficult to access.	Continue to monitor tree health as per national policy and guidance. Prioritise difficult to access larch in felling programme to ensure trees are felled in a controlled manner, balancing cost / benefit of road construction vs fell to recycle. Coupe amendments to enable removal of all mature larch and 20% of all larch within 5 years. Remove accessible larch during harvesting of adjacent coupes where possible.
Control invasive species.	Improve species diversity and protect priority habitats by removing invasive species, including Rhododendron, Himalayan honeysuckle, Japanese knotweed, Western hemlock, bracken	Extensive cover of Rhododendron in some places, requiring large resource commitment to control.	Remove invasive species from priority areas & elsewhere, control spread into surrounding areas.

Management Objective	Opportunity	Constraint	Concept
	& in some places, Sitka spruce & beech that regenerate into adjacent native woodland. Larch is also seeding into felled coupes destined for PAWS restoration.	Dense bracken cover in places, requiring chemical treatment & intensive management to facilitate woodland expansion. Large seed trees of undesirable species in inaccessible places. Other INNS such as Himalayan honeysuckle taking hold in place.	Prioritise felling invasive species adjacent to priority habitats. Plan restock & new planting to be resilient to spread of invasive species. Weed/clean undesirable species from felled coupes at earliest opportunity.

Issues

Presence of conservation or environmental features – opportunities and constraints

- Presence of deep peat
- Extent of open ground and key open habitats, e.g. montane habitat
- Presence of PAWS - extensive ASNW and PAWS in Glenachulish and lower part of Glen Creran; PAWS in Duror and Brecklet, lesser areas in other blocks. Need to identify areas for restoration and others where this is less feasible and continuing to grow non-native conifers would be justified
- Large number of designations and large proportion of land holding covered by designations. Impact of designations on forestry operations and ongoing commitment to maintaining qualifying features in acceptable/ favourable condition
- Presence of priority species – Red squirrel; Black grouse; Chequered Skipper; Pearl bordered fritillary; Juniper; Atlantic oakwood species; Woodland on base-rich soils; Golden eagle; Sea eagle; Wood ants

- Riparian woodland – key feature with large number of gullies and watercourses

- Woodland expansion or contraction – impact on open ground and priority species where there is expansion of native woodland into open ground. Maintenance of agricultural land vs planting. Impacts of contracting commercial conifers away from higher ground on steep unstable slopes

Management Objective	Opportunity	Constraint	Concept
Protect & restore areas of deep peat.	Improve habitat diversity through peat restoration & creation of wetland habitat.	Difficult working conditions & risk of ground disturbance / environmental impacts when felling on deep peat. Spread of invasive species into peat restoration areas.	Prioritise removal of conifers from identified areas of deep peat & remove any young regeneration in these areas. Identify areas suitable for wetland restoration.
Protect & improve quality of priority open habitats.	Improve ecological status of priority open habitats. Identify open ground areas suitable for native woodland expansion. Ongoing monitoring will help determine any impacts of changes in overall grazing pressure due to removal of livestock and deer control.	Control of deer grazing & browsing pressure required to sustain vulnerable or fragile habitats. Some key priority habitats may benefit from appropriate levels of grazing / browsing so balance of grazing levels required. Removal of livestock or reduction in flock size on open ground may have negative impact on some priority habitats.	Identify key priority habitats to protect & improve. Deer control to reduce browsing/grazing pressure to acceptable levels. Site condition monitoring of priority habitat to inform management & operational planning. Expansion of native woodland in identified areas. Grazing management of priority open habitats – to be considered?
Deliver a sustainable PAWS restoration programme that promotes ecological status of PAW sites &	Organise & focus effort to restore first, the sites of highest ecological value & greatest threat, while continuing to deliver a sustainable timber volume across the forests.	Invasive species growing in & adjacent to several PAWS sites & regenerating into felled coupes & nearby native woodland areas.	Following an agreed PAWS restoration programme for the Region: Prioritise PAWS sites to focus restoration effort first on areas of higher ecological value & / or subject to most threats.

Management Objective	Opportunity	Constraint	Concept
restores native woodland.		PAWS sites of low – medium value that are difficult to access. Challenge to develop a viable felling & restoration programme. Pockets of high ecological value PAWS under commercial conifers, frequently on difficult ground. Challenge to restore these & link to existing native woodland. Extensive areas of PAWS – not feasible to restore all areas at once, so need to prioritise.	Identify sites where existing natural regeneration can be accepted & cleaned / thinned to promote required species, developing a full restoration over time. Identify sites where it is acceptable to grow a further conifer crop prior to restoring to native woodland.
Protect priority species & designations & minimise impact of priority species / designations on forestry operations	Liaise with Nature Scot & other key regulators & environmental organisations at LMP stage to develop management proposals that protect the key/qualifying features & integrate their management in operational delivery programmes. Strategic Plan to provide an overview.	LMP amendments can be minimised but not removed altogether, so EIA scoping & approvals will continue to be required prior to amended works.	Zonation of management priorities & identification of environmentally sensitive or important sites will inform management proposals.
Establish open structured broadleaved woodland in all larger riparian zones & maintain open corridor along smaller watercourses.	Relatively rapid improvements to biodiversity & woodland diversity achieved by felling & extracting conifer trees from riparian areas. Improvement & maintenance of water quality by managing open broadleaved habitat in riparian areas.	Many riparian improvements will be pending harvesting of coupes involving a riparian zone. Felling programmes should prioritise riparian improvements where feasible. Establishment of broadleaves will be dependent on adequate control of grazing pressure.	When coupes are restocked, conifer planting to maintain an open buffer zone along riparian areas. Riparian broadleaves promoted through natural regeneration where possible but enhancement planting where necessary. At least 50% open ground maintained along riparian zones to create suitable shade conditions for invertebrates & fish.

Management Objective	Opportunity	Constraint	Concept
			Where possible, fell conifers to open up riparian zones ahead of felling the adjacent coupe, where this will not lead to disturbance, tree instability & greater threat of windblow. Halo thin around existing BLs ahead of clear felling conifer coupes. Protect existing BLs during felling, where possible. Where possible, create native woodland corridors to link riparian zones with existing / planned native woodland areas.
Manage balance of expansion of native woodland into open ground and contraction of productive woodland from difficult/ unsuitable sites.	Environment team have identified suitable areas for expansion of native woodland. Productive woodland can be pulled back from very difficult sites where safety or technical concerns preclude cost effective, safe harvesting or where environmental concerns pertain.	Advances in technology & accepted practices may increase the range of difficult sites that become cost effective to restock. Native woodland expansion will primarily be low density, naturally regenerated woodland. Areas appropriate for planting & productive management should be identified at an early stage of establishment.	Take forward native woodland expansion as project (s) separate to individual LMPs. Identify the most difficult, unstable slopes to retract commercial forestry from at restocking stage. Species selection & design to maintain flexibility for future decision making where possible.
Manage balance of open & forested ground.	Opportunity to identify & protect priority open habitats.	Risks of overgrazing of montane habitat if deer numbers are too high. Conversely, some habitat such as calcareous grassland could potentially suffer competition from more competitive species if grazing levels reduce. But mosaic of habitats exist & calc. grassland may be grazed preferentially.	Areas identified for native woodland expansion. Open habitat surveys have identified priority habitats that can be monitored to ensure favourable condition is maintained.

Management Objective	Opportunity	Constraint	Concept

Issues

Recreation and visitor access

- Recreation - long distance routes including routes to access Munros; trail through Creran to Glenachulish; Sustrans route and tourism/ visitor access and amenity linked to A828

- Larger events such as 6 day trial – affect several forest blocks as well as visitors moving along the A828 corridor
- Tourism – chalets, campsites, canyoning, canoeing, cycling, walking, shooting, slow tourism

Management Objective	Opportunity	Constraint	Concept
Maintain long distance walking routes, access to Munros & other hills and the Sustrans route where this joins the forest roads. **Develop new walking trails where possible.** **Ensure that mountain & trail biking activity within the forests are compatible with forest management.**	Plan management & restock coupes to create boundaries along walking routes so that impacts of management operations on trails are minimised. Liaise with trail bike groups & representative access bodies in forward planning of management & maintenance works.	Resource implications of path & bridge maintenance, so need to prioritise routes & reduce need for expensive infrastructure where possible. Increasing visitor use in forests, including trail bikes moving on & off forest roads. Potential for accidents, particularly where impromptu tracks join forest roads.	Plan management coupes around access routes and trails. Liaison with trail bike groups & representative bodies ahead of planning works & ensure ongoing communication.

Issues

Timber production – maintaining volume production and economic cost / benefit

- Timber production – maintaining sustainable volume production vs financial and logistical efficiency and a positive cost / benefit scenario. Need to consider volume production across all sites

- Large timber volumes stored across the forests – consider options for stands where MAI exceeded already, particularly on more difficult ground / steep slopes

- Opportunities to maximise production on better ground – identify areas suitable for productive conifers (Sitka); productive conifers (alternative species); productive broadleaves; native broadleaves under minimum intervention (zonation)

- Cost / benefit of focusing production in key areas (economics and volume)

- Balance between conifers and broadleaves

- Extraction and haulage – e.g. along narrow public road from forest through Glen Creran (to head of loch); haulage along minor roads through Duror village, from Duror and northern part of Bealach; haulage from western side of Glenachulish

- Roads – need for any new roads and synchronisation with production forecasts. Consider opportunities to avoid new road construction by redesigning coupes and greater use of forwarder tracks, especially for coupes that will restock to minimum intervention. Take into account issue of increasing access by bikes etc. to more remote locations and potential impact on priority habitats or wild land

- Workability
    - steep slopes - need for sky-lining
    - stability issues, particularly Glenachulish; Lagnaha (open ground) and Glen Creran (under native broadleaves area SW of Elleric car park)
    - topography
    - landform and profile (rock and bog)

- Steep slopes and other difficult sites- restock or pull back – economic decision or driven by safety issues? If economic viability of steep ground or difficult working sites is dependent on market conditions then is there less sense in avoiding difficult sites for economic reasons?

- Opportunities for managing productive native crops on some PAWS areas of lower ecological value

- Opportunities for future acquisitions?

Management Objective	Opportunity	Constraint	Concept
Focus production on most appropriate areas, leaving marginal ground to deliver on other non-timber benefits. **Use zoning to identify areas suitable for productive conifers – SS, alt CONs, productive BLs & native non - commercial BLs.**	Improve cost effectiveness by focusing effort on better ground & limiting production on marginal ground, where there are safety implications, or where production costs outweigh benefits. Opportunity to expand native woodland under minimum intervention on poorer ground or difficult to work areas. Environmental services increased including biodiversity; landscape impact & amenity; climate mitigation; carbon storage; flood prevention; catchment protection. Where possible, prioritise coupes where maximum MAI will be exceeded Identify spatially (zone) preferred areas for different types of productive CONs,	Many steep ground areas provide excellent growing conditions & produce high quality / large volumes of timber. Better ground is often on PAWS, broadleaved woodland or other priority habitats & not available for commercial conifer production. Forests are fairly even aged & difficult to improve age diversity over current rotation. Many stands will need to exceed maximum MAI to create some age diversity in restock & to avoid adjacency. Detailed survey & analysis may inform changes to identified zones, which should be indicative only.	Strategic plan can provide an overview of production priorities & areas where non timber benefits should be prioritised – creation of zones. Identify areas where growing conditions are below optimal or where access, steep unstable ground or other issues bring additional complications or costs. Also, areas of existing native woodland; priority PAWs restoration & areas where native woodland expansion would be desirable. ESC & local knowledge to be used to identify areas suitable for productive BLS & alternative CONs. Zones can include productive CONs (SS & Alt. CONs); productive BLs; existing native woodland / minimum intervention; PAWS restoration; successional; woodland expansion; permanent open. Detailed worked up in individual LMPs.

Management Objective	Opportunity	Constraint	Concept
	productive BLS & native woodland under minimum intervention	Zonation should incorporate flexibility, to account for changing needs & priorities. Individual LMPs will identify areas more accurately – this exercise will be indicative only. SCDB & FW technical issues may constrain accuracy of assessing economic aspects. Complex geology & variety of soil types. Variable Yield Classes throughout each block & across the area.	
Plan harvesting programmes to accommodate Timber Transport Routes. **Synchronise road & access track construction with production programmes, taking into account sensitivity of neighbouring open ground habitat.**	LMPs can plan felling programmes to smooth out volume production & avoid high peaks that might create difficulties with timber haulage & transport. Forward planning on approvals & permissions to minimise disruption to construction & felling programmes. Minimise road / track lengths where feasible.	Road & track lines often haven't been surveyed ahead of LMP preparation so indicative lines may be used in the plan, requiring an amendment if the route changes significantly.	Minimise road construction where possible, for example where felled areas won't be restocked with productive crops then use forwarder tracks if possible. Roads to be constructed earlier where larch stands may need pre-emptive felling or removal for SPHN.

Management Objective	Opportunity	Constraint	Concept
Be receptive to opportunities for future acquisitions.	Opportunities to consolidate & expand the existing land portfolio, for productive forestry & native woodland restoration & expansion.	Risk of over-extension if other land is purchased when issues affecting existing ground have not been resolved, such as reducing browsing pressure to sustainable levels; dealing with difficult sites & addressing tree health issues.	Identify land parcels that would enhance the existing portfolio, should they come on the market & assess costs/benefits. Investigate proactive approach to land purchase where appropriate.

Issues

Potentially vulnerable catchments (acidification risk and flood risk)

- Steep ground, relatively small catchments, fast flowing watercourses with potential for flooding – flood risk (Brecklet); peak flow – Glenachulish, Duror, Bealach, Creran

- Some catchments at risk of acidification – Bealach and Duror

Management Objective	Opportunity	Constraint	Concept
Felling programmes designed to reduce amount of run-off from catchments by limiting area felled per year in vulnerable catchments. **Developing open canopied broadleaved woodland in riparian zones to reduce flash**	Opportunities to design coupes to minimise flood risk & acidification, focusing effort on the most vulnerable sites.	Difficult working conditions & poor accessibility around some watercourses. Fragile or vulnerable areas around watercourses that require extra care – remnant native trees, bryophytes etc.	Review acidification & flood risks & prioritise effort for sustainable removal of conifers & establishment of riparian broadleaved woodland. Buffer areas around all watercourses & development of riparian woodland provide framework for development of restocking plans.

Management Objective	Opportunity	Constraint	Concept
run-off & maintain catchment pH.			

Issues

Neighbouring land uses and utilities/developments within forest

- Public and private water supplies and catchments
- Power lines /cables – e.g. Creran power supply for hydro project
- Renewables schemes
- Variety of neighbouring land uses grazing, sporting, residential, forestry

Management Objective	Opportunity	Constraint	Concept
Integrate forest management with neighbouring land uses.	Work with neighbours to ensure that forest management is compatible with neighbours' land – for example, co-ordinated deer management with sporting estates.	Sometimes different objectives than neighbours (deer cull vs sporting). Previously, contracts have limited the flexibility for WR Managers to ensure that deer control is focused most effectively, where young restock &	Work within the DMG to coordinate deer management across the plan area. Ensure that WR Managers are resourced & supported to input to DMGs. Ensure that deer management contracts are fit-for-purpose & focus effort effectively.

Management Objective	Opportunity	Constraint	Concept
		natural regeneration requires greater protection.	
Protect water supplies & minimise negative impacts on catchments.	Liaise with stakeholders (Scottish Water, Local Authourities & private supply neighbours) to ensure that forest design minimises impacts on catchments & protects water supplies.	Up- to -date information on active catchments & water supplies required.	Schedule liaison contacts with Scottish Water & Local Authorities. Ensure access to most up to date data – FW/ARC.
Manage renewable development requests within the current LMP programme.	Prior planning to maintain flexibility for future potential renewables projects or upgrades.	Plans are longer term while developments tend to be reactive. Resource implications for preparing amendments and EIA scoping.	Ongoing liaison with developers & utilities to ensure updates as far ahead as possible. Be prepared for renewables related amendment requests & EIAs – resource implications.
Initiate & pursue opportunities for partnership approaches to landscape -scale control of INNS.	Neighbouring landowners / managers share common issues with extensive spread of Rhododendron & other INNS. Examples of existing partnerships elsewhere, involving a variety of organisations & businesses. Community involvement in existing partnership schemes – opportunities to replicate these successes. Rhododendron control is a national priority.	High resource implications. Steep unstable slopes & difficult working conditions. Previous SPHN for P. ramorum on Rhododendron in some of the forests likely to be repeated. Impacts on scheduled work plans.	Initiate landscape- scale control partnership projects, using lessons learned from existing partnerships.

Issues

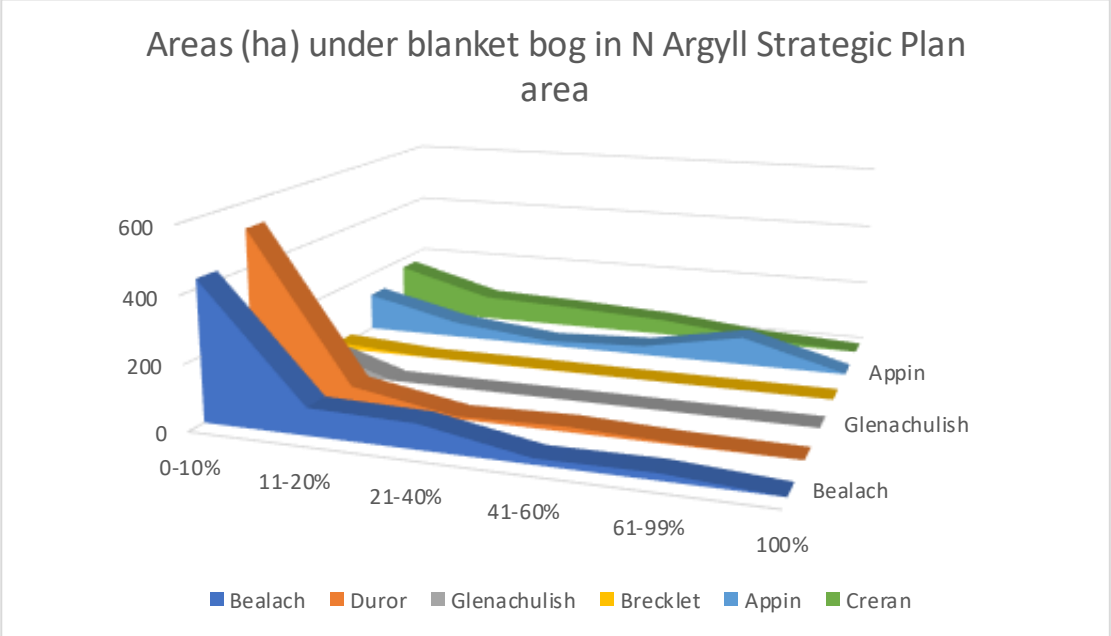
Landscape and visual amenity

- Landscape / visual amenity is particularly important at Glenachulish (highly visible from Ballachulish bridge, parts of Glencoe and the Kinlochleven road on opposite side of loch) as well as from Munros; Brecklet (approach on A82 from Glencoe direction); Appin – from parts of A828 south of forest, from Port Appin road, Port Appin ferry slip and north end of Lismore. Parts of Duror forest (West facing slopes at northern end of forest) very visible from A828

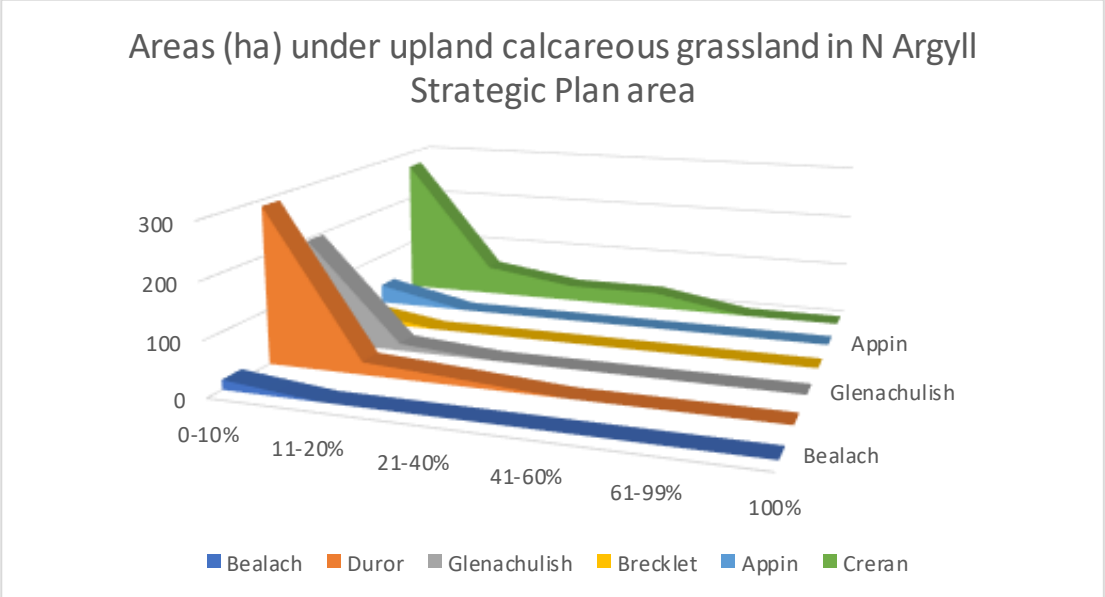
Management Objective	Opportunity	Constraint	Concept
Improve landscape & visual amenity at most highly visible locations.	Increase species, age & structural diversity where possible & improve coupe design to improve visual amenity. Review conifer / broadleaf mix in key locations.	Site suitability for a range of species. Better growing conditions for conifers are often in the most visible areas.	Consider broadleaves or conifer/ broadleaf mixtures in areas of highest landscape value. Design management coupes to minimise visual impact. Create clear breaks between coupes. Where possible, manage coupes under CCF. In highly visible locations, manage single tree, group selection or irregular shelterwood & encourage development of understorey species & increased age diversity in high storey species.

6. Priority habitats and woodland expansion potential

Priority open habitats have been surveyed and expressed as a percentage cover present in each polygon surveyed – *see Maps 6 a - g.*
Blanket bog is present in 2,055 ha across the North Argyll forest area; most commonly present in a mosaic of other habitat types. Where blanket bog present, the largest areas contain 20% or less blanket bog habitat. Only 12% of the blanket bog area contains more than 40% cover of blanket bog habitat (by polygon).



Upland calcareous grassland is present in 1,004 ha across the North Argyll forest area; most commonly present in a mosaic of other habitat types. Where calcareous grassland is present, the largest areas contain 20% or less calcareous grassland habitat. Only 3% of the upland calcareous grassland area contains more than 40% cover of calcareous grassland habitat.



Most of the area covered by these two habitat types lies on the open hill ground, outwith the forested areas.

Surveys and analysis by the FLS Environment team have identified 867 ha of open ground across the linked North Argyll forest blocks where there is potential for native woodland expansion. These areas avoid high priority open habitats such as blanket bog and upland calcareous grassland and take into consideration site conditions, proximity to existing native woodland and adjacent commercial forestry priorities. *See maps 6 a - g and Appendices 11 - 14 for report on Open Habitats and Woodland Expansion Potential.*

The chart below shows the split of potential new woodland sites between the individual forest blocks:

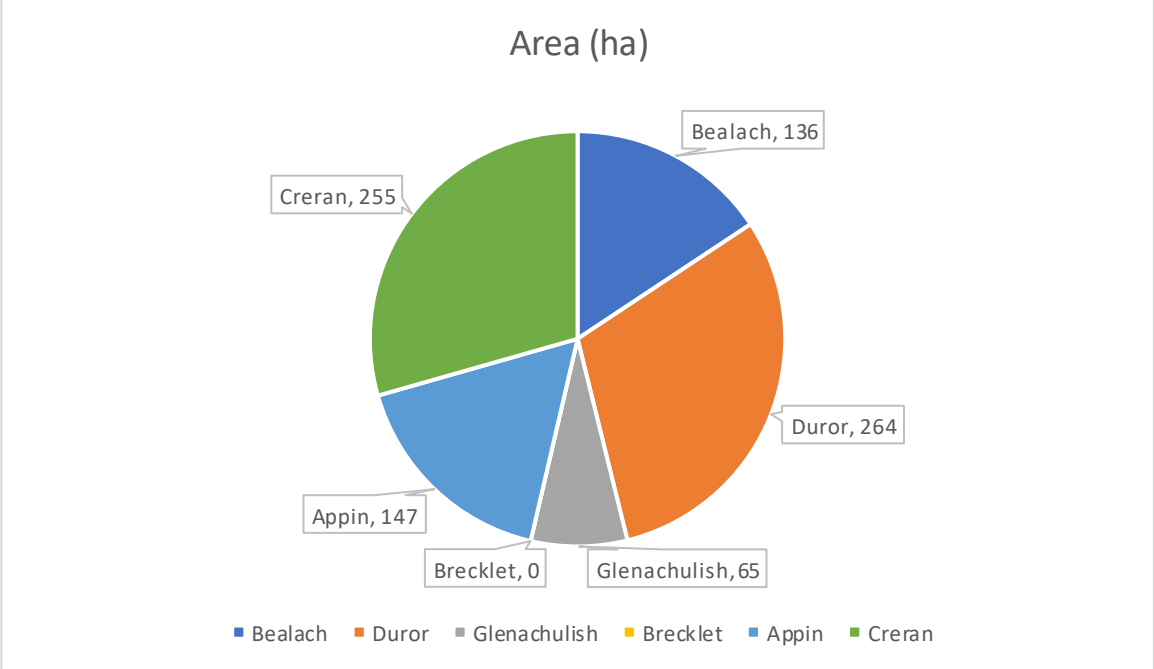
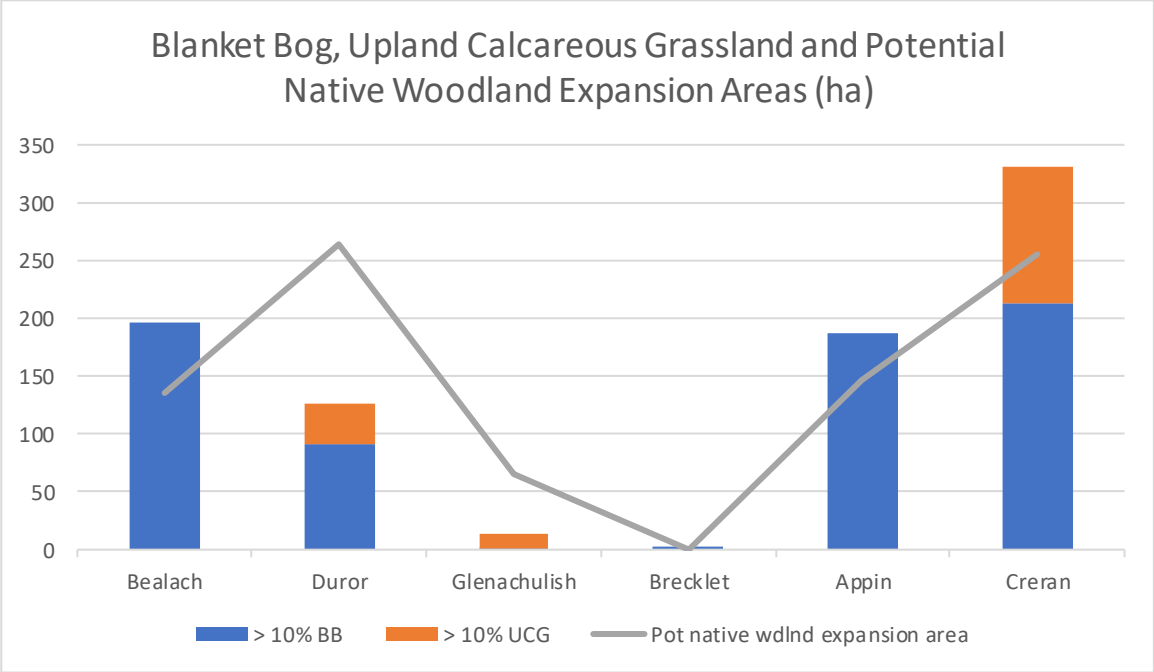


Figure 1 Potential native woodland expansion areas (ha) for each forest block

Priority open habitat areas vary between blocks and the area potentially available for native woodland expansion isn't constrained by the prevalence of priority open habitat but rather, is a function of the total amount of open ground and proximity to existing native woodland seed sources.

Woodland expansion will be taken forward as a separate project(s) following more detailed site assessment.



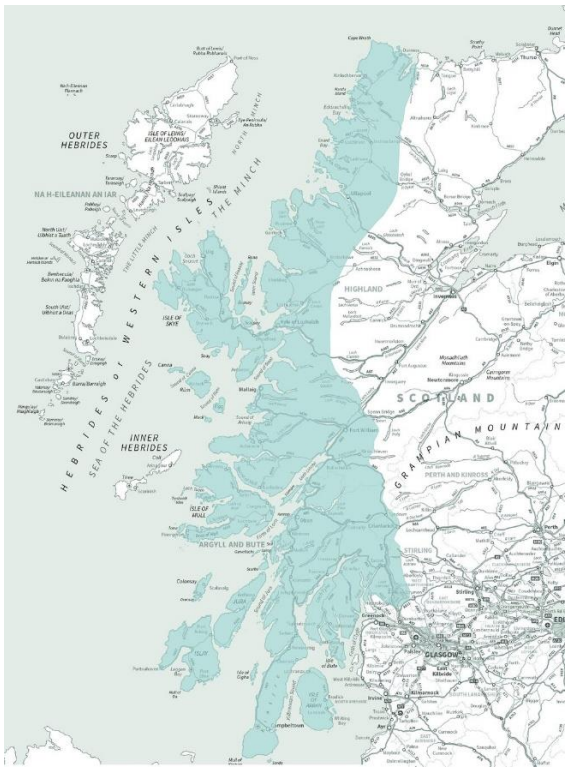
7. Native woodland expansion and designated species

Black grouse have been recorded in various locations across the Strategic plan area. Black grouse are a red listed UKBAP species that has undergone long term range contractions and population declines. The development of open structured, low density native woodland and surrounding open habitat can potentially improve Black grouse habitat, particularly in the development of woodland edge habitat that provides cover and feeding opportunities for grouse through inclusion of native species such as birch, rowan, willow, hawthorn, juniper and alder.

The Glen Etive and Glen Fyne SPA, designated for Golden eagles, covers most of the linked open habitat between the forested areas. Expanding low density native woodland up to the natural tree line and creation of suitable woodland edge habitat through natural regeneration of native broadleaves along upper margins of management coupes will help to improve prey species for Golden eagle. *See also, Appendices 11-14*: *Open Habitats and Woodland Expansion Potential.*

8. Scotland's rainforest

Scotland's temperate rainforest, also known as Atlantic woodland or Celtic rainforest, is a unique habitat of ancient and native woodland, open glades, boulders, crags, ravines and river gorges. These areas are rich in lichens, fungi, mosses, liverworts and ferns.



Scotland's 'hyper-oceanic' or rainforest zone

Temperate rainforest can only be found where there is a high level of rainfall, year-round mild temperatures and clean air. This is a rare habitat – these climate conditions cover less than 1% of the planet!

In Europe, temperate rainforest can be found on the Atlantic coastlines of Britain, Ireland, Norway, France and Spain.

But the best rainforest habitat in all of Europe is found in Scotland.

Where the influence of the Atlantic Ocean is strongest, the effect is termed 'hyper-oceanic' - these conditions are found across the central part of NW Scotland, as well as some areas of the Borders, the Lake District, north Wales and SW England. As well as climate, the rainforest also needs very clean air for oceanic bryophytes and lichens to thrive, which is one reason why Scotland still holds onto its rainforest.

In Scotland, only around ***30,000 ha*** of rainforest is left – an area slightly bigger than Edinburgh – these sites have retained their rainforest biodiversity.

Scotland's rainforests face a multitude of threats and are a priority for protection, expansion and management.

For more information, visit the website of the Alliance for Scotland's Rainforest - www.savingscotlandsrainforest.org.uk