



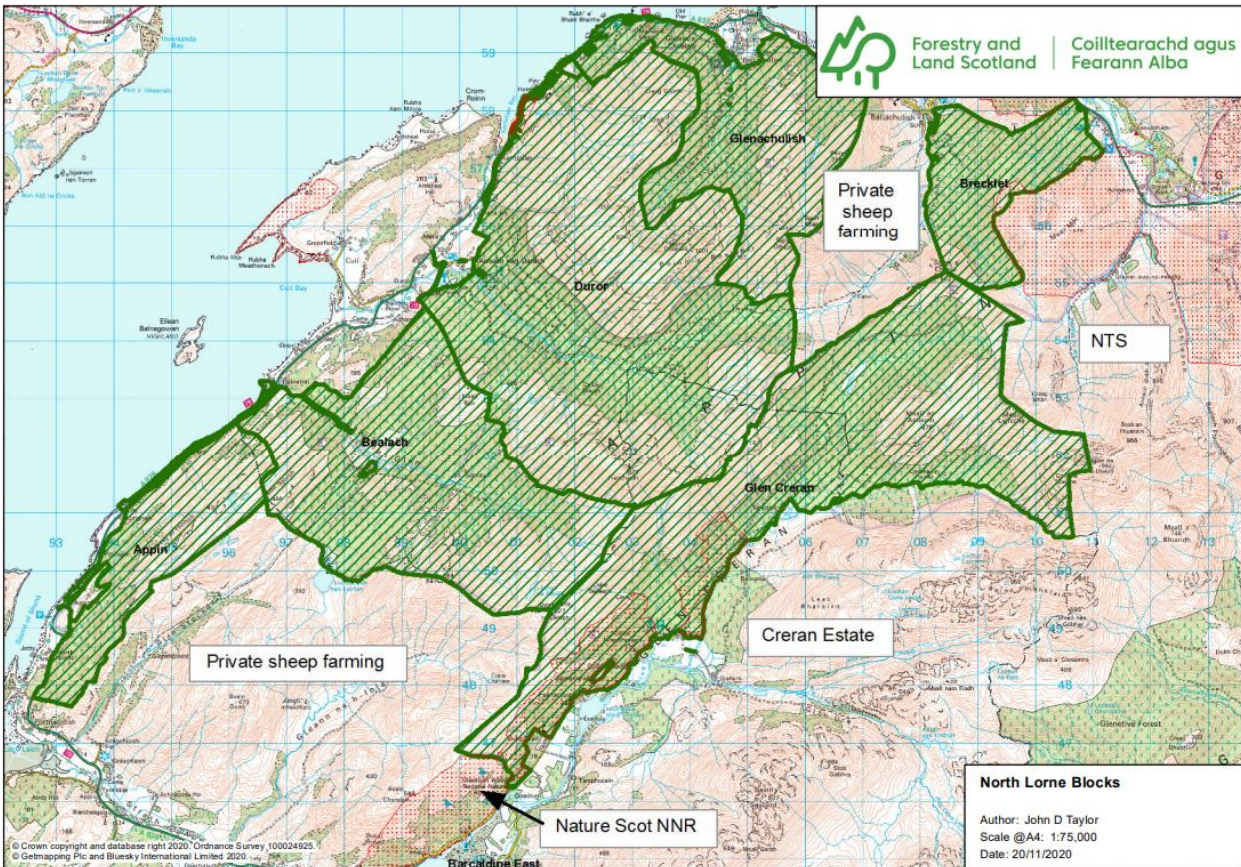
Forestry and  
Land Scotland  
Coilltearachd agus  
Fearann Alba

# North Argyll Open Habitats Management and Woodland Expansion Project

**Glen Creran to Ballachullish**

## Introduction and Study Area

This project was initiated alongside the Land Management Plan (LMP) revisions and renewals of the various forest blocks in the area, namely Glen Creran, Appin, Bealach, Duror (inc. Lagnaha acquisition), Glenachulish and Brecklet which together cover 9,705 ha. Although many of these form distinct and separate forests and are accessed from virtually all sides of the compass, the single common theme is the open hill ground at the centre where the demarcated block boundaries meet (see Map 1). This project underpins and informs the Strategic Plan that is being prepared for these linked blocks.



*Map 1: Blocks and surrounding ownership*

As the map illustrates, large swathes of the area are upland open habitats, either left unplanted in the initial afforestation of the area in the 1960s and 70s or, in the case of Lagnaha, a recent acquisition of a former sheep farm. Native woodland is also a strong influence in the ecology and landscape of the area; the core of this being the lower end of Glen Creran with the Glen Creran Woods SSSI, SAC and the Glasdrum NNR. Other non-designated, but significant areas of ancient upland birchwood exist in the other blocks. Finally, there is the commercial conifer plantation, currently dominated by Sitka spruce and in the process of being restructured - often on steep and difficult ground. See Table 1 for details.

Habitat Type	Area - ha (and %)	Habitats Designated Sites Area (SSSI/SAC) – ha (and %)	Species Designated Sites Area (SPA) – ha (and %)
Open habitat	5632 (58%)	92 (0.9%)	3821 (39%)
Native woodland	352 (4%)	273 (3%)	19 (0.2%)
Native tree species	550 (6%)	173 (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%)
Mixed Conifers	26 (0.3%)	0.65 (0.0%)	2 (0.02%)

*Table 1 Proportions of habitat types and conifer species composition*

It was recognised that a strategic overview of the open habitats, and their management, was needed given that they were split by arbitrary human boundaries but they had very similar habitat types, management needs and in some cases statutory nature conservation designations. At the same time it was decided to re-visit an earlier observation by the beat forester about the pockets of upland woodland fragments in the corries above Glen Creran and the potential for woodland expansion in these areas above the current tree line of both conifer and broadleaved species. As the two subject areas of open habitats and woodland expansion are inextricably linked, it was decided to establish a combined project led by the Environment Team with close Planning Team support.

## Open Habitats Appraisal

The area hosts an array of open habitat types thanks to the complex underlying geology of this part of Lorne. Sedimentary rocks such as limestone and mudstones underwent a metamorphic process caused by an igneous intrusion some 400 million years ago; as such there are base rich flushes and calcareous grassland often lying relatively close by acidic habitats such as upland heath and blanket bog.

The history of the open habitats owe much to the farming of cattle and then sheep in the 17<sup>th</sup> to 19<sup>th</sup> Centuries. The Forestry Commission have been acquiring land in the area since the 1920s up to the present day, for the purpose of establishing commercial forestry but large swathes of open ground remain. Part of Duror was purchased in 1921 from Auchindarroch and Lagnaha Farms, with Glenachulish following in 1927, purchased from Ballachulish Estate. The

remaining part of Duror was purchased in 1967 from Acharn Estate. The Fasnacloch Estate went through a period as a typical Highland sporting estate in the 19<sup>th</sup> Century before part was sold to the Forestry Commission in 1965, while Salachail Farm (which now forms the upper zone of Glen Creran forest) was acquired in 1962. The Forestry Commission bought Appin forest from Appin House Estate in 1960 and Bealach in multiple lots from different owners throughout the 1960s and 70s. The most recent acquisition was the purchase of Lagnaha Farm (1,317 ha of mainly open agricultural land with a small area of ASNW) in 2015, which now forms part of the Duror forest block.

Both the open habitats and the extent and expansion of native woodland are impacted by deer grazing and browsing. Red and Roe deer are common throughout the area and Sika deer are present in low density. Population numbers have increased in recent years, caused by in-migration from neighbouring landholdings but this movement appears to have reduced and the population is now decreasing annually. However, currently Red Deer are still at a high density, while Roe deer are at lower density.

Annual cull figures:

2016/17 = 230 Red, 42 Roe

2017/18 = 543 Red, 75 Roe

2018/19= 308 Red, 33 Roe Deer

Deer density is generally high on neighbouring land; the 2015 SNH count shows 227 Red Deer on neighbouring land West of Glen Creran. The total Blackmount DMG count was 7969 Red Deer.

Glen Creran, Appin, Bealach, Duror, Balachullish and Brecklet LMP areas are within the strategic Deer Fence that runs from Glen Coe to Glen Creran; deer migrate freely within this fence. Migration of Red deer from neighbouring sporting estates can be problematic if the strategic fence is not deer proof.

The last available (2016) herbivore impact survey results for nearest neighbours show 78% soft conifer/broadleaves damage and 15% Sitka spruce damage. Challenges have been experienced in establishing natural regeneration and planted soft conifers and broadleaves, due to high browsing in year one.

Much of the open habitat area is also designated under Natura as a Special Protection Area (SPA) for golden eagle. Although this might appear to tie management into the maintenance of open habitats for eagle foraging and make it unsuitable for conversion to native woodland, this is not necessarily the case as can be demonstrated in the following section.

Open habitat surveys of the area were undertaken between 2008 and 2018 as part of the FES national open habitat survey programme. This entailed mapping all areas listed as 'open' on the sub-compartment database and employing experienced botanical surveyors to visit, create polygons of comparable habitats, or habitat mosaics, and estimate the percentages of each habitat type found within that polygon along with any management recommendations or potential threats recorded such as conifer regen or over grazing. Thanks to this comprehensive

dataset we can make management prescriptions, identify and protect areas of particular importance and locate those areas where native woodland expansion might make a more significant contribution to both the biodiversity and carbon sequestration capabilities of an area.

The most sensitive habitats identified from the survey (and their management pressures) are:

- Calcareous grassland (needs grazing to prevent it becoming rank)
- Blanket bog (needs to be kept wet with no tree colonization to protect the underlying peat, also no trampling by deer/stock)
- Base rich mires, springs and flushes (no interruption of water supply or increased nutrient inputs through soil disturbance or dunging)
- Upland heathland (needs deer/stock management to prevent over-grazing of ericaceous shrubs and conversion to acid/neutral grassland)

(See Appendix 1 for a map of these habitats)

## Upland Calcareous Grassland (UCG) Management

It is widely accepted that all forms of calcareous grassland need some form of grazing or mowing to maintain it and prevent colonisation by more competitive plant species and to prevent a build-up of thatch in the open sward (Nature Scot, Averis et al 2004). This may seem to preclude both the reduction in deer numbers and the encouragement of native woodland expansion which would follow; however, Lyons et al (2018) in conjunction with members of the Upland Calcareous Grassland Workshop concluded that high levels of grazing could reduce the biodiversity of UCG in study sites in Northern England and actually recommend a reduction in grazing intensities in some cases. It also highlights the importance of the matrix of UCG and heathland across a landscape, but this is effectively missing in the North Lorne area due to the long history of intensive sheep and deer grazing suppressing heather growth to a level where most of the hills are dominated by acid or neutral grassland.

The three sources cited in this section agree that it is the *removal* of grazing that is detrimental to the management and conservation of UCG, rather than the reduction in grazing per se, and that, as a preferentially grazed habitat, it is likely to attract more grazing pressure than surrounding habitats even in low stocking density situations. Nature Scot and Averis et al. also state that CG11, 12 and 14 are likely to be near-natural climax communities and that CG13 can be converted to CG 10 (the most common type found in this area) by excessive grazing. In addition to this, the location of much of the UCG in the area will aid in its long-term conservation in the landscape; much of it is on the higher slopes – above the anticipated 450-500m limit of woodland expansion in this area. In a further bid to conserve this montane habitat, the concentration of UCG around the slopes of Meall an Aodainn and Meall Lighiche (NE Glen Creran) has been excluded from any woodland expansion aims.



Reducing deer numbers in a landscape of this size and terrain will not be a fast process, it will take at least 5 years before any change is visible. Ongoing monitoring can be set up to record the quality and area of the more important areas of UCG to confirm the theory that deer will continue to graze and maintain this valuable habitat component.

### Blanket Bog, Base Rich Mires, Springs and Flushes

Although distinct and very different habitats in many aspects of their ecology, these habitats have been grouped together for their shared requirements of persistence of water through protection from drainage or transpiration by tree cover.

The waterlogged nature of these habitats make them an almost self-managing habitat in the absence of external detrimental factors.

Grazing animals can be detrimental through poaching and trampling of peatland and will also impact the bryophyte communities of the springs and flushes. Increased dunging and nutrient inputs of the latter habitats can also lead to the spread of more competitive plants such as rushes and the loss of the bryophytes and other low growing plant species.

Drainage is the most obvious direct impact, but the altitude and difficult terrain of all these surviving examples are unaffected by the past afforestation practices and are in a near natural state. Woodland expansion will be achieved through natural colonisation with no ground preparation or drainage; as such these habitats will continue to self-regulate and persist in the landscape.

### Upland Heathland

Upland heathland can be an under-represented habitat in the West Coast Uplands due to the less than favourable climatic conditions for heather (specifically *Calluna* spp.) growth, competition from vigorous grasses such as *Molinia* and past management practices such as intensive grazing and burning which have tipped the balance in the favour of grass species. Continued high deer impacts in certain areas tend to perpetuate this imbalance through the winter grazing of ericaceous shrubs leading to the typical dominant heathland species being a minor 'understorey' component of a grassland canopy – to use a woodland analogy.

A reduction in deer grazing pressure is unlikely to affect the dominance of grasses directly as their speed of growth more than makes up for the level of biomass removal by grazing deer. However, the tables can be turned at the opposite end by reducing the grazing/browsing pressure on the ericaceous species, thus allowing them to put on growth in the summer which is maintained through the winter, rather than being browsed off, and therefore being more competitive with the grasses in the following growing season.

Woodland expansion therefore is not in direct competition with Upland Heathland in this environment as the very mechanism for facilitating tree seedling growth will also benefit the heathland plants in their recovery to co/dominance with the grasses.

## Golden Eagles and the SPA

The golden eagle is an iconic Scottish species, inextricably linked with open habitats and upland areas and a perceived wisdom that this species is reliant on open ground for foraging. This is mirrored in the area of the Loch Etive and Glen Fyne Special Protection Area (SPA) which cuts out the vast majority of afforested and wooded areas (See Map 2). However, modern ornithological thinking questions this approach and asks whether the eagles are simply surviving in what habitat is available to them, rather than their preferred habitat. The golden eagle has a global Holarctic range with eagles in different countries utilising a range of habitats (Watson 2010); some almost exclusively open range but many others in a mosaic of open and semi wooded or scrub landscapes such as those in Sweden and Finland in the North (Sandgren et al. 2014) and Greece in the South (D. Anderson pers. comm.). Initial findings from satellite telemetry studies of both juvenile and adult eagles in Scotland appear to support this view and that forest edges are more important than previously understood (D. Anderson, P. Whitfield pers. comm., Whitfield 2019 in press) – indeed, many of the Eastern Scotland golden eagle nests are found in mature Scots Pine forests.

Existing guidance on expanding woodland in SPAs also indicates that there is little evidence of a negative impact on breeding eagles from native woodland expansion (Haworth and Fielding 2013). The loss of open habitat and associated prey species such as red grouse may well be more than compensated for by the increase in more numerous woodland prey species such as woodpigeon, hooded crow, black grouse and even buzzard, all of which feature in eagle prey remains. Given that expansion will be via natural colonization there is less degree of control than with planting programs, but it is strongly envisaged that colonisation will favour the sheltered gullies and corrie floors and not gain a foothold on the higher elevation exposed ridges which receive the worst of the winter weather and where deer can congregate in summer to avoid midgies. As such it will leave these highly favoured hunting and soaring features (Fielding et al. 2019) free for eagles to continue to use in their foraging habits.

As stated in the Open Habitats section; the current open habitats are largely grass-dominated with the heathland component reduced to an under-storey by herbivore impacts. A reduction in deer density will allow the regeneration of both tree seedlings and the heather and berry species relied upon by the low, but existing, red grouse and ptarmigan populations.



Glen Etive SPA

Author: John D Taylor

Scale @ A4: 1:75,000

Date: 04/12/2020

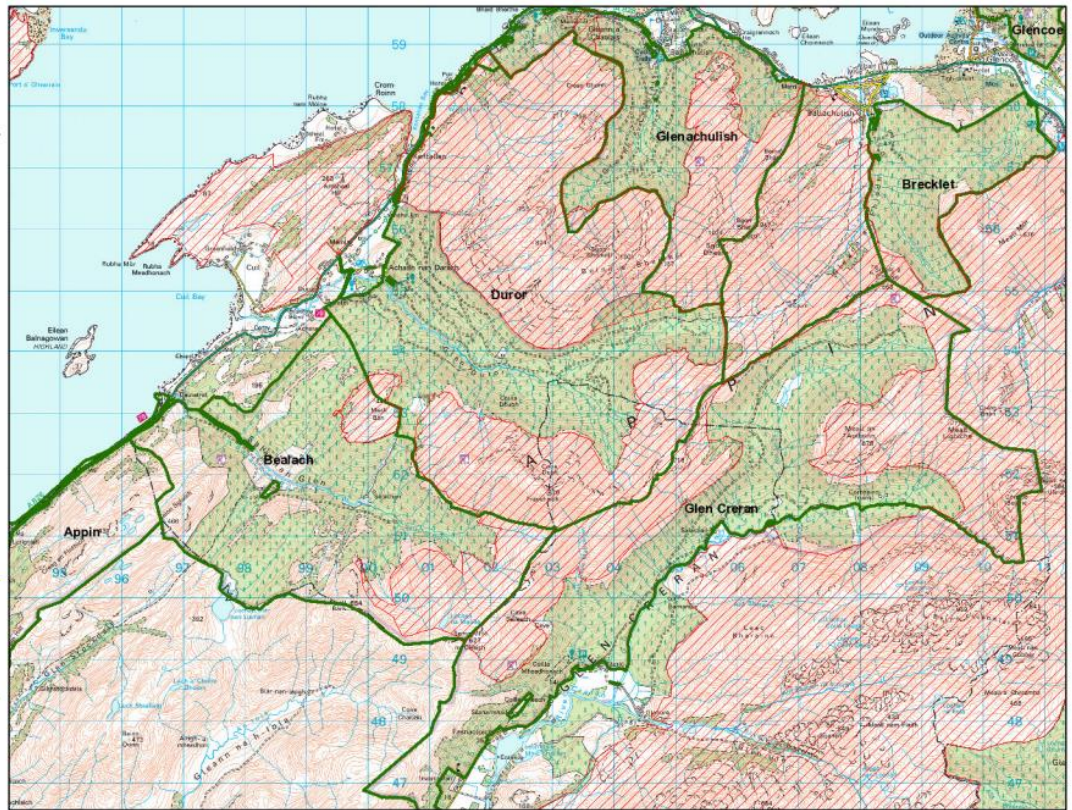
Legend

Special Protection Areas (Scotland)

Special Protection Areas (Scotland)

Blocks

Blocks



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Map 2: The North-West corner of Loch Etive and Glen Fyne SPA which covers most of the open ground in the project area, but avoids most areas with tree cover.

Eagle territory occupation in this corner of Argyll/Highland appears to be poorly understood at this time. The area is on the Northern and Southern limits of Argyll and Highland Raptor Study Groups respectively and appears to ‘fall between the gaps’ of raptor worker coverage. The Nature Scot golden eagle territory map associated with the Range Reports shows 3 territories covering this area – NA8, NA9 and to a lesser extent NA7. Confidential information supplied by Stuart Benn of Highland RSG suggests a possible extra territory (NA14) covering the South-West of the project area and an NA15 territory to the East. However, much of this data is now quite dated and the National Survey of 2015 only gives a ‘snapshot’ of breeding occupation. In 2018 Forest Enterprise Scotland, as was, commissioned a survey of the area by Coope Ecology to look at general eagle usage in the area and to try and locate any active nests in the North and West parts of the study area. This study surmised that there were unlikely to be any active nests within the study area in that particular year and that prey availability was low enough that birds confirmed to be present nearby may only breed every other year due to a lack of live prey (Coope 2018). To coincide with and compliment this study, FES staff/ARSG members observed known nest sites in the East (with appropriate Schedule 1 licences in place) and confirmed that the accepted main territory for the area (NA9) was active, with a large chick on the nest, but that a presumed NA9 alternate site was also active - only 3km to the North. This second site is likely to belong to NA7, or possibly NA8, although this seems less likely as a long standing FLS Environment Ranger has checked that territory several times in the past and



concluded that it was likely inactive (P. Madden pers. comm.). The NA9 site was active again in 2019 but the NA7/8 site was vacant that year. No surveying was conducted in 2020 due to Covid restrictions.

Eagle territory maps can be provided on request via a confidential appendix.

## Native Woodland Expansion

As shown in Map 3 below, native woodland of ancient origin (i.e. pre 1750) is a major influence on the glens and even the hills of this area. Even so, the 1<sup>st</sup> Edition Ordnance Survey (1844-88) and the General Roy maps (1750s) are mapping a landscape strongly influenced, or even created by, a history of relatively intensive rural industry. The late 1700s saw the conversion of much of Scotland's hill ground to sheep farming and the intensification of grazing pressures associated with this, followed by the slow contraction of many upland woodland sites through a lack of regeneration ability. Prior to this and pre-Highland Clearances, woodland would have been either managed as a resource for firewood, timber, stock shelter etc. or cleared to make space for small scale subsistence cereal and vegetable growing.

Over two hundred years of intensive grazing practices, from sheep or deer, have in many cases led to the demise of upland native woodlands as they have been unable to sustain themselves. Many other woodland remnants are hanging on, with some of the trees present very likely to be the same individuals mapped in the mid-19<sup>th</sup> Century! We are now at a time which recognises the value of native woodland; for biodiversity, carbon capture and other ecosystem services and are looking to actively increase the woodland cover of Scotland. Expanding outwards from existing ancient woodland onto historically wooded areas will give the best chance of success and the most biodiversity gains by allowing the woodland specialist plants and organisms to colonise the regeneration front as it grows (FCS 2012). It also allows the woodland to adapt to climate change by 'moving' within the landscape and to replace a missing part of most upland ecosystems in the UK – the transitional zone from native woodland to mountain woodland to montane scrub to the open habitats of heath and grassland.



AWS and Designated Habitats

Author: John D Taylor  
Scale @ A4: 1:100,000  
Date: 02/12/2020

Legend

Special Areas of Conservation (Scotland)

- Special Areas of Conservation (Scotland)

Sites of Special Scientific Interest (Scotland)

- Sites of Special Scientific Interest (Scotland)

Ancient Woodland Inventory

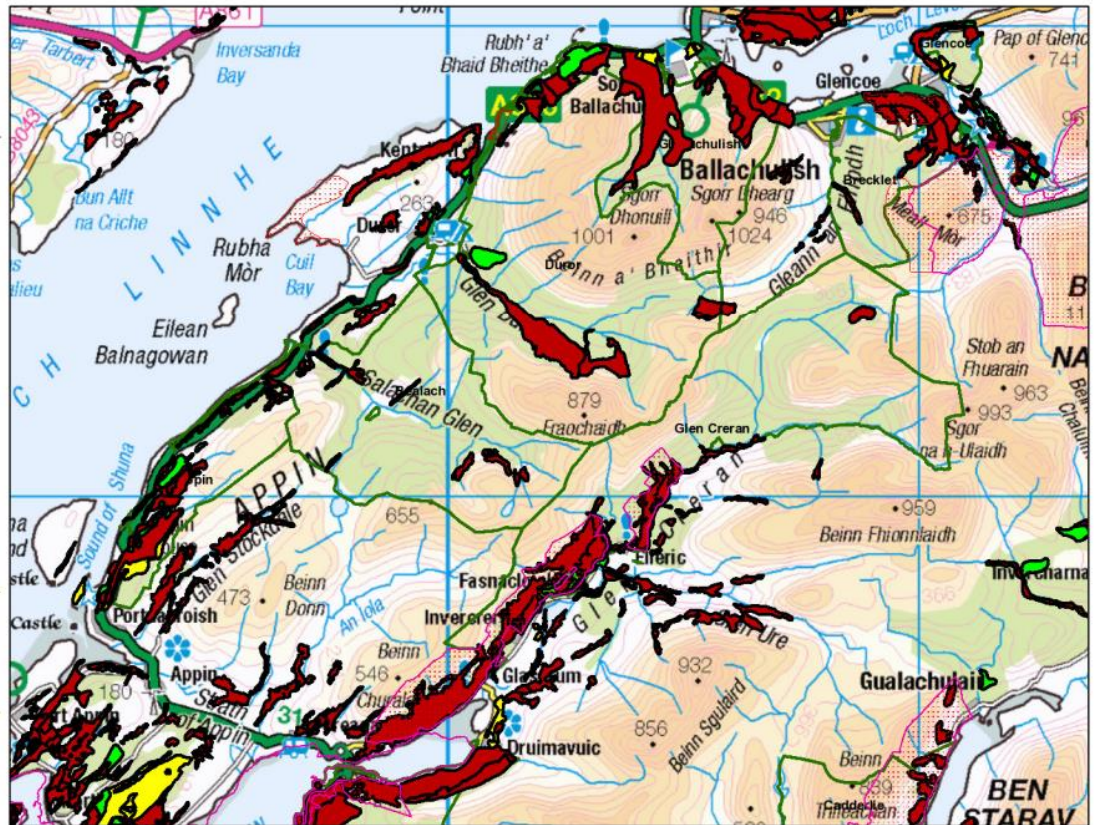
- All other values
- Ancient (of semi-natural origin)
- Long-Established (of plantation origin)
- Other (on Roy map)

- Blocks



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



Map 3: Ancient Woodland in the North Lorne Area. Note that this inventory was compiled by a subjective analysis of historical maps and the more upland/montane woodland depicted as scattered trees was often left out as it was deemed not to meet the required canopy cover to be 'woodland'. See <https://maps.nls.uk/geo/explore/#zoom=12&lat=-56.63508&lon=-5.14308&layers=5&b=1> for the 1<sup>st</sup> Edition OS maps of the area.

Field visits to the open ground above the current tree line have been used to confirm the desk analysis of the open habitat data; also to assess the likely upper climatic limits for meaningful tree growth – the so called 'timberline'. As such, areas referred to hereon as 'woodland expansion' are those areas where we think trees can develop their usual upright form and girth before giving way to a more stunted and scrub like montane woodland zone beyond. These areas should therefore meet the Scottish Forestry definitions of 'woodland' and be able to be counted towards net woodland expansion targets. The current situation and justification are best described photographically, glen by glen.

PowerPoint presentations on woodland expansion opportunities and constraints in each forest block are provided in Appendices 12-14. Maps 6a – 6g show the relationship between areas of calcareous grassland, blanket bog and native woodland expansion.

Approximately 867 ha of open ground in the FLS Strategic Plan area has been identified as suitable for native woodland expansion:

Forest block	Area (ha)
Appin	147
Bealach	136
Creran	255
Duror	264
Glenachulish	65

No suitable areas have been identified in Brecklet.

The largest expanses of potential expansion are in Glen Creran (255 ha) and Duror (264 ha). The land suitable in Duror is the recently acquired Lagnaha, which was previously a livestock farm and has small areas of existing remnant native woodland.

In Glen Creran, the main focus would be to expand native woodland on the slopes above the Creran Woods SSSI. A core of native woodland remnants survive in the inaccessible parts of burn-sides in the “Three Corries” – Coire Seilach, Coire Challum and Coire Mulrooney. These would be the starting points and seed sources for the higher altitude species, with anticipated movement up the hill from the designated mature native woodlands below.



*Photo 1: Coille Mheadhonach with the 300m contour marked. The arrow points at the same knoll as in Photo 2 below. Note that although this is the defined upper edge of the woodland, there are pockets of woodland surviving on steeper ground above this, indicating trees can*



grow here with reduced grazing/browsing.



*Photo 2: Note the continuation of the 300m contour into Coire Seilach and the potential for infill of woodland below this point. A riparian woodland strip follows the burn up to the 300m contour in the corrie currently.*



*Photo 3: Remnant birch/rowan riparian woodland extending up to 325m above sea level and protected from browsing by the incised nature of the burn at this point.*



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## Personal Communications

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Benn, Stuart. Highland Raptor Study Group – Golden Eagle Species Co-ordinator. Experienced raptor field worker with specialism in Golden Eagles.

Madden, Pete. FLS Environment Ranger, Lochaber. Experienced eagle field surveyor.

Whitfield, D. Phillip. Director Natural Research Ltd. Funder of most Golden Eagle satellite tagging and analysis work in the UK.