

**MONTANE
SCRUB
ACTION
GROUP**



Scrubbers' Bulletin 9



Cover photo:

Willow scrub restored by planting within exclosure,
Coire Odhar, Ben Lawers NNR:
including *Salix lapponum* & *S. arbuscula* in area shown.
Photo taken 2008.

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The Bulletin of the **Montane Scrub Action Group**,
a partnership of individuals supported by their organisations.

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For further information regarding these personnel changes please see update on p. 35.

Welcome to issue number 9 of the Scrubber's Bulletin,

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Earlier issues of the Bulletin may be read at www.mountainwoodlands.org

We are most grateful to the authors for their contributions to this issue, as follows:

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Mountain woodland in the Galloway Forest Park

Rob Soutar Forest District Manager, Galloway Forest District, Forestry Commission Scotland

Summary

Forestry Commission Scotland is learning about natural mountain woodland from the volunteers of the Action for Mountain Woodland (AMWood) project. New information on montane scrub and natural treelines is inspiring the new “woodland fringe” habitat that is replacing some 3000 hectares of coniferous forest at high elevation in the Galloway Forest Park. The results of volunteer surveys and the action this inspires is summarised and discussed.

Introduction

The zone of climatically dwarfed trees and shrubs that once linked forest and open mountaintops has almost vanished from Scotland along with much of the special wildlife that lived there. The Action for Mountain Woodland (AMWood) project aims to assess the current state of Scotland’s threatened mountain woodlands and involve the wider public in work to restore this important habitat. It provides opportunities for volunteers to help in developing an inventory of mountain woodland sites. Educational events and activities are organised for both the general public and land management professionals to raise the profile of this once forgotten habitat. The project is aimed also to demonstrate best practice for management and restoration of mountain woodland. The AMWood project was established by the Montane Scrub Action Group and is managed by Highland Birchwoods with the funding & support of the Heritage Lottery Fund, Cairngorm Mountain, Clyde Muirshiel Park, Scottish Natural Heritage and Forestry Commission Scotland.

CVCWT volunteers build the mountain garden at Glentroll Visitor Centre.



The Merrick part of the AMWood project is a partnership with Forestry Commission Scotland (FCS), Cree Valley Community Woodlands Trust (CVCWT) and Scottish Natural Heritage (SNH). It is located in the Galloway Forest Park where volunteers are mapping native trees and shrubs on the Galloway hills and gathering seed and cuttings to grow on new planting stock, particularly of Downy Willow *Salix lapponum* and Juniper *Juniperus communis*. Mountain trees and shrubs are being used at a demonstration mountain woodland on the Merrick hill path and at a raised garden close to the Glentroll Visitor Centre. The garden will also feature mountain herbs and other

plant species found in the Galloway hills and elsewhere in the Scottish mountains.

The information collected by the volunteers and the expertise being developed will also be used to inform and energise a major Forestry Commission Scotland initiative to enrich the Galloway Forest Park with new treeline woodlands (or “woodland fringe”) of broadly native character replacing nearly 3000 hectares of high elevation conifer plantation.

The oakwoods of Glentrool stretch to open hills



The 70,000 hectares of the Galloway Forest Park comprises planted coniferous forest around a core of moor and mountain habitat. About 40% of the Galloway Forest Park is open semi-natural habitat but only about 1% is native woodland, albeit this is of very high quality in terms of natural history.

The planting of Sitka spruce in the 1970s and 1980s extended to some areas in the Galloway Forest Park which FCS would now leave unplanted, not least because

many about designated mountain and moorland habitat of outstanding natural heritage value. Today, many of the higher altitude conifers (and other areas adjoining high quality semi-natural habitat) have been replaced by “moorland fringe” and “woodland fringe”. These are essentially mosaics of planted broadleaves and conifer regeneration within a matrix of restoring moorland habitat. Moorland fringe has a target of less than 20% tree cover and woodland fringe between 20-50% tree cover. These new “fuzzy” scrub habitats replace the previous hard edge of the conifer plantations, providing landscape benefits and greatly widening the habitat available to moorland edge species such as black grouse.

Information from nature in the Galloway Forest Park

Natural treelines and other montane scrub are among the rarest natural features of the Scottish landscape. Occupying the zone above the timberline¹, treeline woodlands and other montane scrub link high forest to the open hill. They contribute structural diversity that is associated with a wide range of groundflora and animal species and form a natural transition zone. This is often virtually absent from our mountains owing at least in part to past human management with grazing and fire, from prehistory to the present. Treelines are rich in trees and shrub species such as rowan *Sorbus aucuparia*, birch *Betula pubescens*, aspen *Populus tremula*, willows *Salix spp.* and roses *Rosa spp.*, and stretch out to the scrubline where we can find high altitude specialist such as downy willow *Salix lapponum*.

Dwarf Willow @ Mike Lofthouse



An exception that proves the rule is the dwarf willow *Salix herbacea*, which is amongst a number of tiny prostate willows that grow well above the scrub line into the alpine zone in Scotland. Dwarf willow is very common in the Galloway hills. This is perhaps surprising given that even the highest hill in southern Scotland, the Merrick is only 843m (2766 feet) above sea level. However, the altitudinal zonation is generally lower in Galloway than further east in Scotland. This is because the relative exposure gradient is steeper for reasons

restorable timber could be won in a natural forest of native species.

this author is uncertain of, though presumably the powerful south-western airstream is influential. At about 500m the treeline is actually much lower down than it is in the Cairngorms (700m).

Up until recently, natural treeline woodland and other montane scrub in Galloway was thought to be restricted to a beleaguered downy willow *Salix lapponum* population on the Merrick and to a few remnants of juniper *Juniperus communis* scrub on cliffs. I am very grateful to enthusiasts such as Richard Mearns, Peter Norman and Ian Murgatroyd who began to catalogue the distribution of tree and shrub species across the Galloway hills and extend our knowledge.

Downy Willow on the Merrick



Surveys by the AMWood project have now identified that the Merrick downy willow population is far more substantial and widespread than previously reported and in generally very good condition. There are certainly more than 250 large vigorous plants and copious natural regeneration from seed, with clear observations of mass flowering of both sexes. Representatives of the Montane Scrub Action Group have confirmed that the Merrick population is one of the healthiest downy willow populations in Scotland. We used to think it was one of only three locations south of the Highlands, the others being at White Coomb in

the Borders and Helvellyn in Cumbria, but we have actually found a fourth small population on Kirriereoch 2km north of the Merrick site. Earlier records of creeping willow *Salix repens* have also been confirmed and extended, overwhelmingly associated with cliffs, crags and islands in high elevation lochs, presumably owing to past grazing pressure. Downy willow reaches about 700 metres, the effective scrubline. However, the altitude record for Sitka spruce *Picea sitchensis*, regeneration is a touch higher, so please note that comments in this article about treelines and scrublines apply in respect to native species only; some introduced trees have the capacity to grow well beyond these limits.

Juniper at Kirriereoch



Juniper in the Galloway Forest Park is found from about 300 metres to 600 m in altitude, with the biggest population on the south facing bluffs and crags of Kirriereoch. The Kirriereoch juniper population is far more substantial and widespread than previously reported, though comprised of generally very old plants. About 250 individual plants have so far been catalogued and the overall population of the Galloway Forest Park is unlikely to exceed 500. Most individual juniper are about 1 metre across and all are procumbent or decumbent (i.e. sprawling across the ground!)

even though they are *Juniperus communis communis* and not *Juniperus communis nana*. Some are up to 5 metres across and are massive, ancient plants. All over Galloway – at least wherever we have surveyed, we have only found one young juniper plant. It is not clear why the juniper population continues to decline and is not recruiting, though recent fires seem to have killed older plants without encouraging any regeneration.

Before surveys by the AMWood project it was thought that treeline woodland of native character was absent from the Galloway hills. However the surveys have identified that rowan *Sorbus aucuparia* scrub is a widespread feature of cliffs, crags and boulder fields,

often at around 400-500 m in altitude. This scrub is generally limited in stature by exposure and limited soil capacity. One newly discovered area extends to 10 hectares of waist high rowan at high density (exceeding 2000/ha).

Although rowan is by far the most common species, the apparent treeline scrub is rich in species such as aspen *Populus tremula*, juniper, birch *Betula pubescens*, Burnet rose *Rosa pimpinellifolia*, downy rose *Rosa mollis* and less commonly hazel *Corylus avellana* and oak *Quercus petraea*.

Aspen and rowan on Hoodens hill



Moorland fringe and Woodland fringe

Cairnsmore of Dee



The idea of moorland fringe arose through the observation that people in Galloway were often seeing glamorous wildlife, for example black grouse and dense flocks of bullfinches, on the edges between moorland and forest. This did not then imply that edges were actually more species-rich than either the moors or forests, but only that they were a good place to view wildlife. However, we reasoned that if we tried to emulate natural treeline woodland we would create a fuzzy boundary which would provide a wider edge habitat for wildlife and also look better in the landscape. We also had a few examples that had arisen by serendipity such as at Cairnsmore of Dee where black grouse were using similar habitat (and which we have subsequently enhanced by removing excessive spruce, since this photo was taken).

Czech Republic crumholz



We were also inspired by examples from other countries where treeline scrub is typified by its rich herb groundflora and bird fauna. Examples include the treeline on the volcano Mount Hood in the Pacific northwest and the crumholz of the mountains of the Czech Republic where the wind and the snow has bent and twisted the trees to form cushions which shelter a very rich herb groundflora.

The creation of moorland fringe in Galloway over the past five years appears generally to be travelling in the right direction, though intervention is necessary on some sites to remove excessive spruce regeneration such as at Cairnsmore of Dee (or accept that parts of the moorland fringe will return to conifer woodland).

FCS, CVCWT and SNH are working together to improve the specification (most recently through the AMWood project). In another SNH-funded project, the British Trust for Ornithology (BTO) are testing the benefits of moorland fringe and also providing guidance on its creation and management. In their provisional (unpublished) report, BTO has

identified this new habitat is used by a staggering 59 bird species and tends to be of highest value to birds with woodland cover extending to about 30%. It currently seems unimportant what the tree species are; most of the survey examples are predominately Sitka spruce scrub with a few broadleaves. It is presumed that the early colonists are responding to the structure of the vegetation. I speculate that in time wildlife will also respond to the species of woody plants. In particular, rowan and other berry producing species will I suggest influence the future distribution and abundance of many bird species.

We have learned from the fragments of natural treeline scrub that we should promote a woodland fringe specification with which we will plant far more native species. This recognises the exceptionally slow process of natural recruitment of native trees and shrubs versus Sitka spruce. Woodland fringe will be much richer in native trees and shrubs than the old "moorland fringe". Rowan and birch will be the main species planted, though we will increasingly use other species of local origin including aspen, eared willow *Salix aurita*, downy willow and ultimately juniper (though there are enormous supply chain issues with juniper).

The Galloway Forest Park Mountain Woodland Vision

The overall vision is twofold:

- to enrich the Galloway Forest Park with new mountain woodlands of broadly native character, replacing nearly 3000 hectares of high elevation conifer plantation. The objectives are improved biodiversity, landscape and the amelioration of surface water acidification².
- to conserve and cherish the remaining fragments of existing treeline and other montane scrub, with the emphasis on monitoring and natural regeneration, unless faced with a rapid decline. Most of the mountain woodland fragments are on Special Areas of Conservation (SAC) which are highly natural areas where intervention by extensive planting is inappropriate.

The woodland fringe should over time have a canopy cover ranging from 20-50% and averaging about 30%. This is in response to the studies by BTO and current definitions of native woodland (which permit some non native conifer element in open native woodlands). We will plant native trees and shrubs to a much greater extent than hitherto to speed up naturalisation - but herb species will not be planted and will have to colonise on their own.

The challenges to the vision are:

- The previous moorland fringe category generally had too few trees to maximise benefits to landscape and wildlife and we are not getting sufficient pace in creating scrub habitat, though there are many exceptions.
- There are places where there is excessive Sitka spruce regeneration. Some of this will be allowed to return to conifer woodland but there should be periodic removal of spruce from high priority areas for wildlife and landscape.
- There is insufficient natural regeneration of native trees and shrubs owing mainly to a scarcity of seed sources.

² Surface water acidification originates as airborne pollution in excess of the buffering capacity of the acid geology and soils of the Galloway hills. Compared to short vegetation, tall conifers scrub out more pollutants from the air, or rather from cloud, with greatest impact at higher elevations. Although the problem is declining with improvements in air quality, it is still a significant issue for Galloway Forest District.

- In terms of planting, there is poor supply chain for local origin native trees and shrubs.

In pursuing our objectives we will:

- increasingly move from the moorland fringe to the woodland fringe specification; instead of planting a few native broadleaves to supplement natural regeneration (say 5% potential cover by planted trees) we will plant at least 4 times more (>20%).
- seek to collect, cultivate and plant a wider range of native trees and shrubs.
- periodically remove spruce regeneration when it becomes excessive, some spruce regeneration is helpful to birds but too much has to be dealt with. It is also a costly business so must not be too frequent in our interventions.

And most of all we will continue to learn and work in partnership with CVCWT and SNH.

The AMWood project

As well as inspiring and energising the Mountain Woodland Vision of the Galloway Forest Park, the AMWood partnership in Galloway aims to make a contribution throughout Scotland. Beyond the cataloguing of montane scrub distribution and species, the project has cleared conifers from the uppermost part of the forest from which the Merrick hill path emerges onto the flanks of Ben Yellaray. Rowan, birch aspen and downy willow have been planted as a means to demonstrate the potential of treeline woodland and also to highlight conservation issues in interpretive products to be made available at the mountain garden at the nearby Glentool Visitor Centre.

Volunteers from CVCWT have built the garden from local rock and soils and established a range of mountain species including woolly willow *Salix lanata*, downy willow, creeping willow, juniper, aspen and mossy saxifrage *Saxifraga hypnoides*. The garden and hill path demonstration will be interpreted for visitors this summer. 50,000 people visit the centre each year and as many as 100,000 may visit its car park where the garden is situated. We want to inform these visitors that montane scrub is an important, threatened and very interesting habitat, which is well worth conserving and expanding.

CVCWT volunteers at NTS nursery, Killin

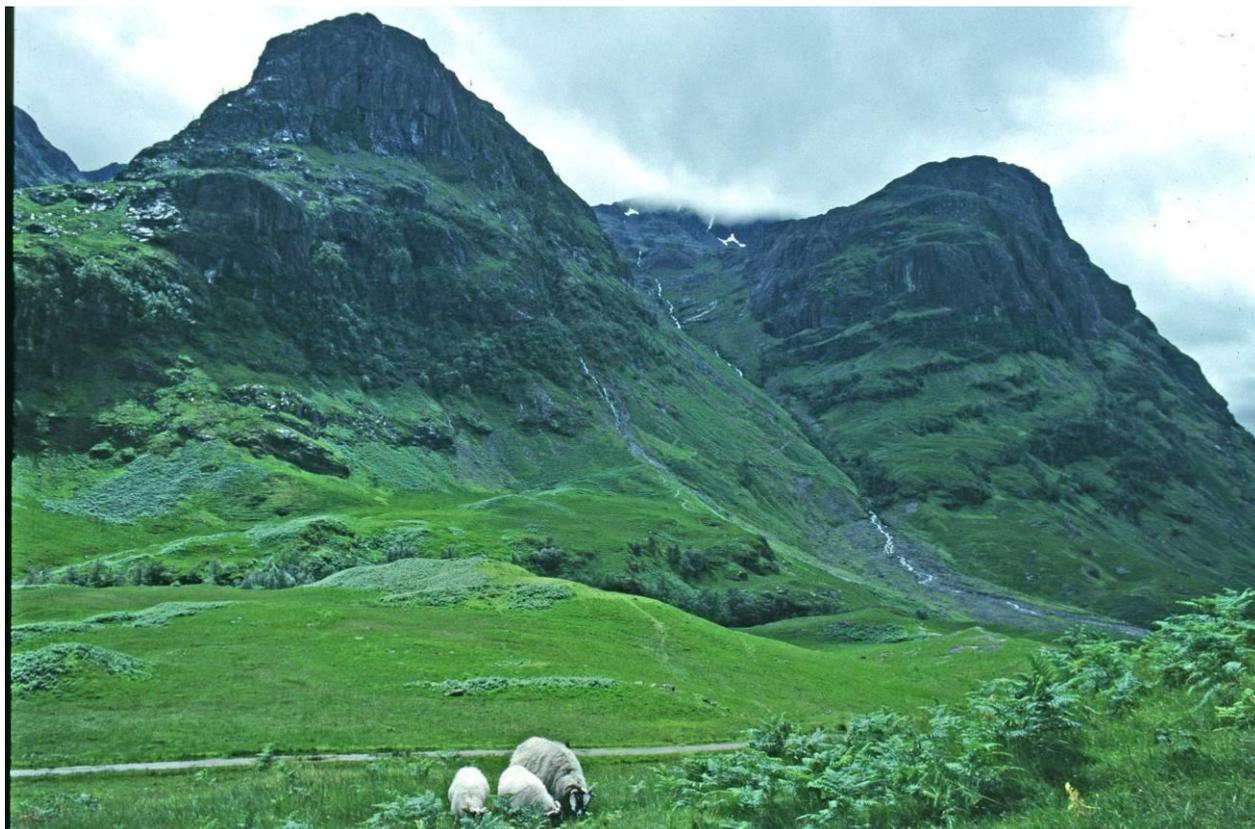


The final stage of the AMWood Project is to help with the plant supply chain for local origin trees and shrubs. Volunteers have collected cuttings and seed to bring some of the rarer species into cultivation with a view to enriching the woodland fringe habitat. This is on a small scale but still aiming to produce a few thousand plants each year. CVCWT and FCS are establishing small local nurseries which will specialise in less common species and we are grateful to the National Trust for Scotland (NTS) and to Borders Forest Trust for inspiration and generous advice from their nurseries at Ben Lawers and Carrifran respectively.

Montane Scrub at Glencoe

Dan Watson NTS Ecologist, Ben Lawers NNR and Glencoe

Anyone passing through Glencoe and glancing up at the mountains to either side of the road should notice trees, mostly rowan and birch, clinging to the crags, particularly along the Three Sisters. Fingers of birch woodland creep up Coire Gabhail from the floor of the glen, but like most Scottish hills the land accessible to deer and sheep is still mostly devoid of woodland and scrub. What remains as a relict of the woodland above the tree-line, and what is likely to happen to it in the future?



Whortle-leaved Willow *Salix myrsinites*

Meall Mor, at the western end of the glen, is probably the most important area for montane scrub in Glencoe. *Salix myrsinites* is scattered on craggy ground at an altitude of c. 540 - 610m on the north to north-eastern slopes of the hill. Meall Mor is geologically distinct from the better known mountains nearby, as limestone outcrops on this side of the hill. This has given rise to a calcicolous flora. Mountain avens *Dryas octopetala* is particularly common on and around rocky outcrops and other species such as hair-sedge *Carex capillaris*, moss campion *Silene acaulis*, green spleenwort *Asplenium viride*, purple saxifrage *Saxifraga oppositifolia*, alpine saw-wort *Saussurea alpina* and more rarely alpine cinquefoil *Potentilla crantzii*, can be seen in similar places on the hill. The grassland is species-rich to a low altitude, contrasting with the more acidic vegetation on the lower slopes further up the glen. Species such as Scottish asphodel *Tofieldia pusilla*, frog orchid *Coeloglossum viride*, early purple-orchid *Orchis mascula* and melancholy thistle *Cirsium heterophyllum* make a stroll on a sunny day here a botanical delight.

This has given rise to difficult management decisions, as the grassland is maintained by low intensity sheep grazing. This was detrimental to scrub species and by 1995 Viv Halcrow recorded that 75% of the *Salix myrsinites* was 'heavily grazed.' As a result, it was decided that to protect the montane scrub the only option was the installation of a 19.3ha enclosure fence. This was erected in 2000 and encloses the majority of the willows, with around 30 plants recorded inside the fence and 16 outside. Highland cattle are also present, but they never venture anywhere near the areas where *Salix myrsinites* grows. The only alternative to fencing would be to drastically reduce the amount of grazing animals. At least at lower altitudes it seems likely that this would lead to a rapid expansion of woodland. At present there are large areas of heavily browsed downy birch *Betula pubescens* and eared willow *Salix aurita* on accessible ground adjacent to areas of established woodland on the crags and in gorges. The removal of grazing would see these rapidly growing and undoubtedly expanding into adjacent grassland. Of course, to some extent it is a subjective decision whether to favour woodland and scrub over grassland, but given the overall diversity of grassland plants on Meall Mor, the option of fencing has been chosen.

Unfortunately there was no detailed survey of the *Salix myrsinites* at the time the enclosure was established. In 2006 John Watkins surveyed the willows for a dissertation. He located as many plants as possible, photographed and measured them. Diana Gilbert accompanied him on one day, and inside the enclosure they found four plants which she thought were probably only a few years old. The intention is to repeat this at six year intervals. Site Condition Monitoring of the montane scrub in 2009 found it to be in unfavourable condition due to heavy browsing, both within and outside the enclosure. This appears to be mainly due to red deer being able to leap the fence. At present the main option is to improve the fence by installing an electrified outlying wire. If the fence is made deer-proof, it may be that the resultant denser sward will make natural seeding of *Salix myrsinites* less likely, so following the proposed monitoring in 2012 it will be timely to consider whether the population needs to be bolstered by planting.

Similarly, no baseline survey of the vegetation was carried out at this time, so it is difficult to know how things have changed over the past decade. There has been some concern that two of the nationally scarce species mentioned above, mountain avens and hair sedge, might decline due to increased competition from taller plants. Mountain avens was monitored in 2010 and at present it would appear to be doing well inside the enclosure. Hair sedge has not been looked for so thoroughly. I can recall having seen it outside the enclosure but not inside, although it may well be present, and was recorded there in 2003. Of course there may have been less change than may have been expected due to the continued incursion of deer into the enclosure. Monitoring of the vegetation within the enclosure will commence in 2011.

Tea-leaved Willow *Salix phylicifolia*

Although not strictly one of the montane willow species, tea-leaved willow is known to grow at altitudes up to 600m, and similarly to its close relative dark-leaved willow *S. myrsinifolia*, would seem to have a good claim to being an 'honorary' member of this select group. It is known from two main locations at Glencoe. One is on craggy ground below Stob Coire Altruim on Buachaille Etive Mor. Here it grows at an altitude of c.500m with rowan and downy birch. It has also been found scattered along the crags below Aonoch Dubh, particularly on the rhyolite, which is easily seen from the glen as pink rock above the grey andesite. Once again rowan and birch are present, as well as scattered juniper, at an altitude of c.500m.

Juniper *Juniperus communis*

Although not visible from below in the same way as rowan and birch are, juniper is actually quite widespread on craggy ground. With relatively few records at Glencoe a survey was carried out on a number of days between 19th August and 13th October 2010. Initially this focused on re-finding those junipers for which records already existed, but usually the route chosen to reach these points travelled through terrain where more plants were likely. Of those previously recorded, the only one definitely not re-found was that near the summit of Meall Mor, recorded by Ben and Alison Averis in 2003.

Other potential lines were walked, mostly between crags and easy scrambles. On nearly every route junipers were found. In some places they were reasonably common, in particular on the northern slopes of each of the Three Sisters. The altitudinal range is the widest for any tree or non-dwarf shrub species at Glencoe, from c.200–900m, although around 90% were found within a narrower range of c.500-800m. As a generalization juniper is most likely to be found on the ground which is too steep for deer and sheep but with enough suitable ledges for it to gain a foothold. As there is so much of this terrain at Glencoe there is little doubt that many more junipers await discovery.

With this being the first time juniper has been surveyed, albeit only covering a small amount of potential ground, it is impossible to say what the population trend is. There was a good size range of plants, with most being below 2m² but the largest up to 7m². Of more concern was that of 137 plants seen, only one had any berries.

The future for montane scrub at Glencoe

Currently the main species of concern is *Salix myrsinites*, being confined to a relatively small area on one hill. As mentioned above, a decision will soon be made as to whether the population should be increased by planting from plants grown on from seed and cuttings. As the species-rich grassland is maintained by grazing, it seems that there is little option but to maintain the enclosure fence for the foreseeable future. *Salix phylicifolia* and particularly *Juniperus communis* are more widespread.

The National Trust for Scotland manages Glencoe using three different zones. Meall Mor and the lower ground towards the visitor centre (excluding the alder woodlands along the Coe) are grazed with 500 sheep (ewes and hogs), largely for the reasons described above. The aim on the slopes of the Three Sisters and Aonach Eagach is to encourage natural tree regeneration. Sheep were removed in 1996 and the deer cull is based on the results of annual monitoring of tree regeneration, with the current target being around 5 deer per km². From the monitoring it seems that although seedlings of rowan and birch are prolific, once they grow above the height of the surrounding vegetation and attract the attention of deer they are eaten. However, as most of the willow and juniper is on the higher craggier ground, they will hopefully have a chance to spread into more accessible areas. At present the monitoring, being confined to lower ground, does not pick up on this. Further up the glen around Buachaille Etive Beag and Buachaille Etive Mor sheep have also been removed but a higher density of deer is tolerated. The management intention is to encourage the spread of wet and dry heath habitats, so it is not anticipated that there will be any spread of woodland here. Overall, however, we hope that montane scrub will be safe at Glencoe well into the future.

A parallel universe – montane scrub depletion and regeneration in coastal southwest Norway

Duncan Halley, Norwegian Institute for Nature Research

Last year, I and my colleague (and eminent montane scrub botanist) Dr. Dagmar Hagen visited Glen Feshie in connection with the environmental restoration plan there. It was Dagmar's first time in Scotland, and I well remember, about halfway up the path from Achlean to the west Cairngorm plateau, her turning to me and saying with frank astonishment "I know you said there was no birch or willow zone in Scotland, Duncan, but *there's no birch or willow zone in Scotland!*".

If you live in Norway her surprise at the totality of the loss of these habitats is easy to understand. Everywhere, from the extreme north to the extreme south, and from the most oceanic coastal mountains in the extreme southwest to the driest, least oceanic tracts, there is almost always a zone of scrub woodland of some kind between the timberline and the alpine zone. Its presence is taken for granted. This is by and large true of mountain landscapes throughout the world, except in arid and high arctic zones, where there is no woodland at all. You don't have to take my word for this, or even to visit Norway to see for yourself – all of Norway is covered by satellite photos sharp enough to distinguish individual bushes, available to all at the Norgeskart website

<http://kart.statkart.no/adaptive2/default.aspx?gui=1&lang=1> (click on the box marked 'imagery')³.



Figure 1. Ecotone from closed spruce woodland at right through montane scrub (mainly birch) to the alpine zone at left in Lund kommune, Rogaland, in extreme SW Norway (58.439N, 6.386E). The spruce limit is about 300m a.s.l. and the highest tops at left of shot c. 430m. The lowest point is the water body (Ljosvatnet), at about 285m. This is a mild area with strong winds, on the same latitude as northern Scotland and c. 25km from the open sea (the height a.s.l. of the mountain woodland zone and its altitudinal range tend to increase as one goes inland). At this location montane scrub is mainly birch, increasingly dwarfed with elevation; in areas with less mild winters and longer snow cover willow

³ The site is based on a two layer approach, so the image can look fuzzy at intermediate scales. Zoom in further and the sharpness will return.

predominates at higher levels. The underlying rock is quartz monzonite, an infertile igneous rock similar to granite but with a smaller percentage of quartz. Image from Norgeskart website, reproduced under 'fair use' provisions of Norwegian law.



Figure 2. Two montane scrub associations from the Setesdal Vesthei mountains on the borders of Rogaland and Vest-Agder in extreme SW Norway, approximately 58.8N 7.0E. Underlying geology of the area is predominantly various granites and gneisses, acidic and infertile; the coast is about 60-70km WSW. On left the association is krummholz pine and birch scrub on very thin soils, on the right birch and willow on deeper soils.

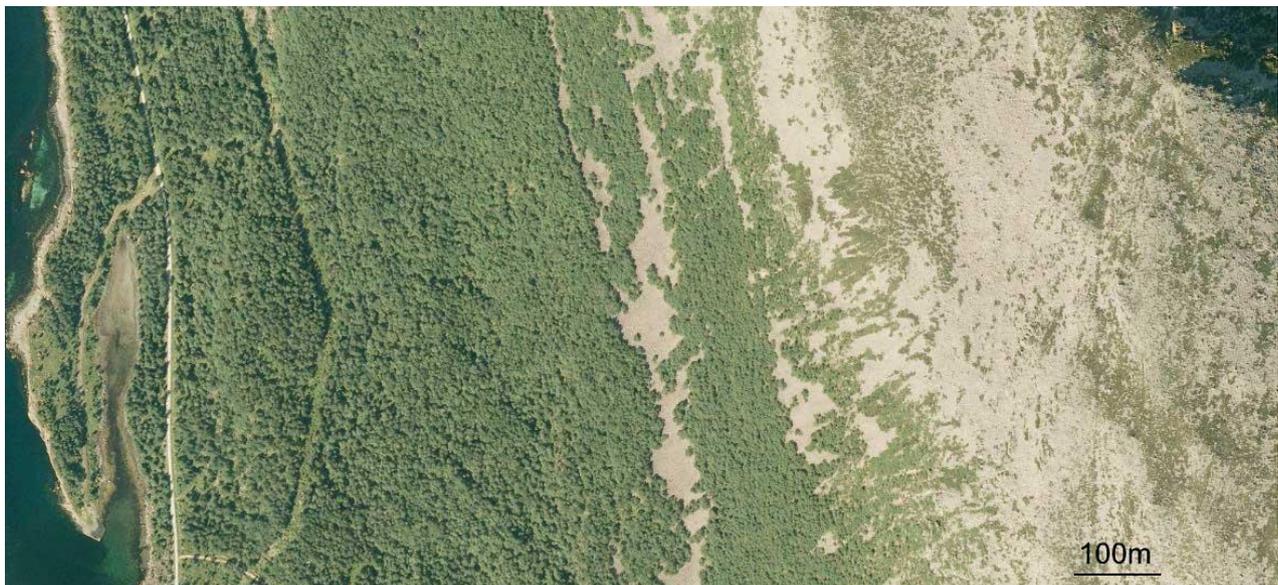


Figure 3. Ecotone from sea level woodland through birch-dominated montane scrub to the alpine zone at 61.700N 5.000E. This steep and exposed coastal slope faces directly on to the North Atlantic Ocean (left) and is perpendicular to the prevailing wind direction. The upper limit of scrub is about 480m; the highest top on right of picture 560m. Wind is the primary feature limiting montane scrub elevation at this site. The climate at this site is highly oceanic, mild (mean January temperatures 3-5C at montane scrub elevation in most years and little snow), and extremely wet (>3000mm precipitation in most years). The underlying geology is sandstone. Image from Norgeskart website, reproduced under 'fair use' provisions of Norwegian law.

The species composition of the montane scrub zone varies from place to place in Norway; in coastal regions with little winter snow birch predominates, increasingly dwarfed with altitude. However, even there montane willows are a frequent feature of the vegetation, while inland in colder climates with more winter snow cover willow predominates at upper levels, especially on relatively richer soils. But montane scrub of some kind is almost always found, the exceptions being bogland (though see below), and a few local patches where domestic stock grazing has remained sufficiently intense to inhibit regeneration. It wasn't always like this. The extent of montane scrub has increased greatly over the last 80 years, well over doubling in terms of biomass. This is almost entirely due to a steep decline in the intensity of domestic stock grazing and associated human activities in the natural montane scrub zone (Bryn 2008; Bryn & Debella-Gilo 2011; Rekdal 2010a). It is a major component of the 136% increase in standing deciduous timber volume in Norway over that period (Source: Statistics Norway⁴); most of the rest being regenerating woodland at lower levels on the coast, which appears to have been almost entirely open for many centuries, and probably for several millennia (Blom 2007). So much so that the term “den skogløse kystrand” (the treeless coastal rim) was a vernacular landscape term in Norway until recent years (Blom 2007). Owing to the lack of woodland in the area, peat was cut extensively in coastal Norway for domestic use into the 20th century; on some of the islands of mildest climate and longest lasting intense grazing, until the 1980s (Espen Lie Dahl *pers.comm.*).



Figure 4. Sollia farm, Verrafjorden, More og Romsdal (right centre of picture). This old hill farm lies above a fjord at 310m a.s.l. (63.208N 8.872E) in coastal western Norway, and was occupied until the early 20th century. At that time peat was cut at Sollia for domestic fuel, owing to the lack of trees in the landscape at that time. The process of regeneration is still underway. Underlying geology is quartz diorite of the Caledonian orogeny.

⁴ http://www.ssb.no/english/subjects/10/04/20/skog_en/ and subtables

All of this more than doubling in volume⁵ is through natural regeneration, as deciduous wood is neither planted nor managed for timber production in Norway (coniferous woodland is up 156% in volume, but that in part owes to management changes). Enormous areas are involved: “Much of our ‘utmark’ (areas used for grazing or low-intensity hay production purposes but not ‘inbye’ land or enclosed fields) has been deforested. This is now returning to forest....around 15% of the total land area may be rewooded, mostly in montane and coastal areas” (Rekdal 2010b). Rogaland province, on the same latitude as northern Scotland in the extreme southwest, is considered to have a particularly high potential for both coastal and montane woodland regrowth (Bryn & Debella-Gilo 2011). As a very mild area with an especially oceanic climate, exposed to prevailing westerlies, it was particularly vulnerable to deforestation in previous centuries.

Native wild browsers - roe deer, red deer and moose - were rare (moose, red deer) or extinct (roe) in Norway in the early 20th century, and have only become common in recent years. This was due to competition with domestic livestock; to lack of hunting regulation on the modern pattern; and to differences in social history which precluded the establishment of hunting as the sole object of land management over extensive areas. This may have assisted the early stages of regeneration. Currently, while populations of all three species are at historic highs⁶, regeneration is on such a scale that wild browser impact has had little discernable effect. Red deer remain largely restricted to mild areas of the SW near the coast, but there are very common; moose are found everywhere except for much of the SW; and roe deer in suitable habitat throughout.

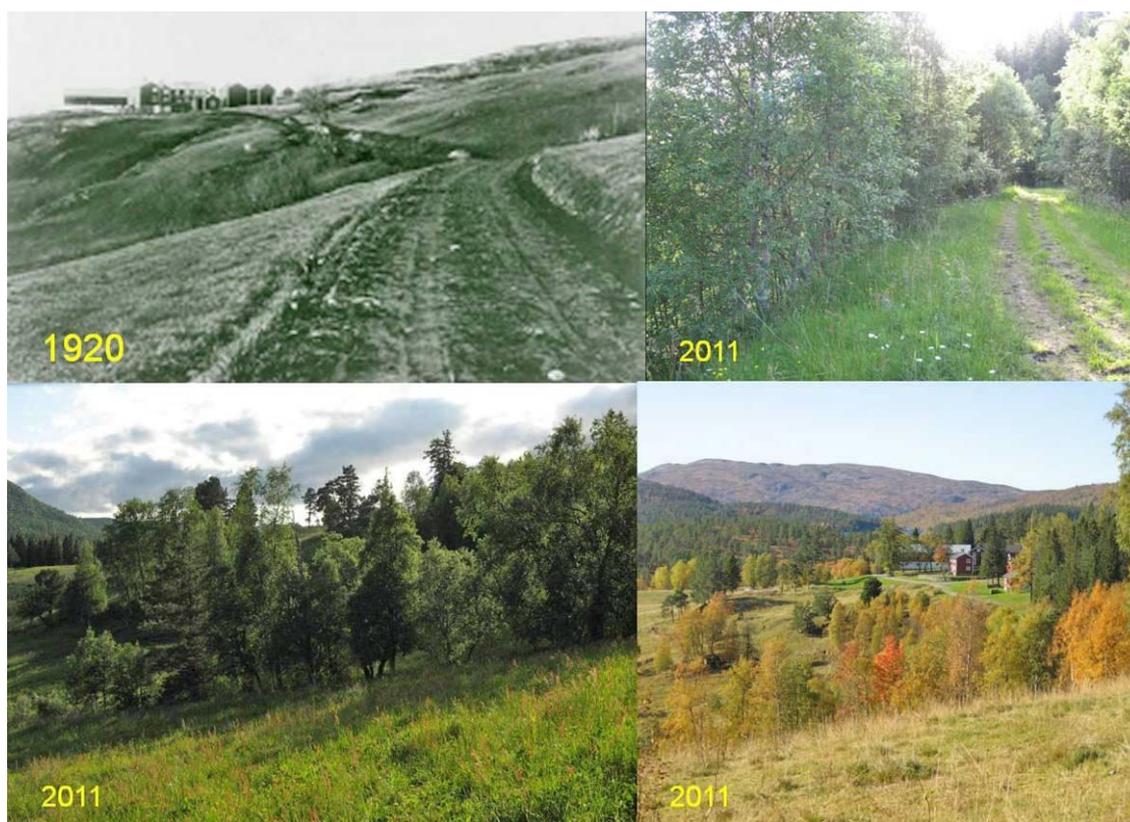


Figure 5. Songli farm, near Trondheim, lies at 300m a.s.l., and 25km from the main coastline (ie excluding fjords), just below the apparent transition line to montane scrub.

⁵ For historical reasons, Norway collects statistics based on timber harvest considerations. This is why the information is by volume rather than area.

⁶ http://www.ssb.no/english/subjects/10/04/10/nos_jakt_en/. 38,800 roe, 37,700 red deer and 36,000 moose were harvested in season 2009-10, all from land with primary economic use(s) other than hunting. Both red and roe deer are in addition considerably larger and heavier animals than their Scottish counterparts and yield more venison, with better trophy heads.

Location of upper two photos 63.330N 9.652E, looking west. Succession is still in progress, so the ultimate lower and upper elevations of the montane scrub zone are still unclear. The farm went out of agricultural use, mainly rough grazing for sheep and goats, in the early 20th century. The photo top left shows the landscape in 1920; top right from the same spot today; bottom photos from the fields maintained open by summer grazing to the left and right of the track in the upper photos respectively. The geology is Caledonian orogeny, mainly gneisses and schists with granite intrusions.

So far as a perceived problem exists in Norway, it is that there is *too much* regeneration of montane and coastal scrub, on the lines of “when I was a lad you got a fine view of the fjord/dale from the road, but you can’t see it now for all these bushes” (Bryn & Debella-Gilo 2011). It is ironic – in more ways than one for Scots, perhaps - that 100 years ago “it was commonly believed that our (Norwegian) forests would soon no longer exist, and initiatives were implemented to counteract the deforestation” (Statistics Norway, introduction to forestry statistics), while today in Norway there are schemes where fencing has been erected and subsidies paid to keep domestic stock *in* at high densities to preserve for amenity reasons old rough grazings and heathland, particularly in coastal and montane scrub zones, from being overwhelmed by natural regeneration (Bryn & Debella-Gilo 2011).



Figure 6. Sheep fenced in at high densities to control willow regeneration on old upland grazings. Note bark stripping of willows. The few browse lines I have ever seen in Norway have invariably been inside fenced enclosures.

I mention all of this because one still hears sometimes versions of the old revisionist view from the 1980s that Scotland is in some way systematically different from Norway in climate so that the lack of woodland regeneration in general, and of montane scrub in particular, is somehow ‘natural’ and not primarily a result of historic (from the Neolithic

onwards) and modern human land use patterns. The usual referents are Dovrefjell or Rondane, both somewhat less oceanic in climate than Scotland and relatively far from the sea. Many areas of Norway are indeed colder and have more snow than Highland Scotland – but other areas are not and do not, and those areas have montane scrub ‘as standard’ as well, at the climatically relevant elevations (and are heavily wooded at lower elevations as well). The view cannot stand up to even a short inspection of the vegetation of south and west Norway, where the rocks and soils are generally poor and acidic, and the climate very similar to northern Scotland⁷. The southwest (Rogaland and Vest-Agder) is perhaps the closest parallel, as the latitude is the same as northern Scotland, and climate and geology are highly similar, but places as far north as coastal Nordland are similar in weather patterns⁸, land forms, and underlying geology to some inland areas of Highland Scotland.

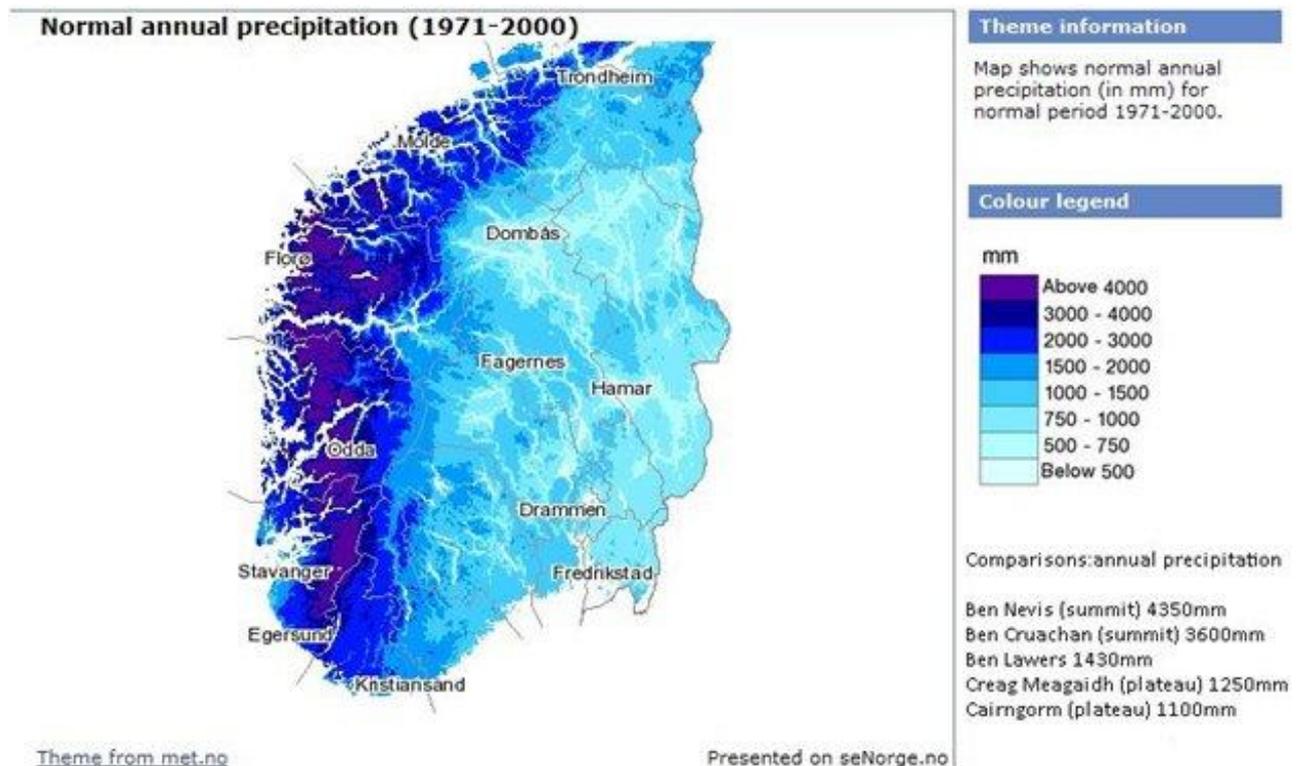


Figure 7. Annual precipitation in southern Norway, with comparisons to locations in Scotland. As in Scotland precipitation peaks a short distance inland from the west coast, as weather systems from the Atlantic are forced upwards over the steep coastal mountains; and declines with distance eastwards. The assertion is occasionally made that the climate of Norway is more ‘continental’ than that of Scotland and this explains the lack of montane scrub. While true to an extent of districts like Hedmark north of Oslo (‘less oceanic’ would be more accurate), it is not at all true of coastal regions as far ‘inland’ from the prevailing weather stream as the eastern Highlands. Montane scrub is common in these regions.

⁷ My experience is that visiting groups from Scotland usually base themselves in places like Rondane or Evenstad, near the Swedish border north of Oslo where the climate is an unoceanic as it gets in Norway, and the underlying geology is predominantly sedimentary in origin and relatively fertile. These are fine places to visit, but not the best choice in either climate or landforms if comparison with Scotland is your purpose.

⁸ There is an excellent searchable mapping database on Norwegian weather data available at <http://senorge.no/>. Specifically, the assertions I have seen and heard in Scotland that a) Highland Scotland is wetter than Norway; b) that Highland Scotland has less or less reliable snow cover than Norway; c) that Highland Scotland is milder in climate than Norway; and d) that Norway’s climate is more ‘continental’ than the Scottish Highlands, are all untrue as regards SW, and in some cases S&W Norway, as abundant weather data attests.

The only partial exception to the presence of mountain woodland in some form between the timber line and the alpine zone, apart from remaining pockets of intense grazing, is where the ground is too boggy for tree growth. 6% of the land area of Norway is classified as bog (Statistics Norway), and there are extensive blanket bogs in many places. The same factors are involved in their origin and development as in Scotland. However, even there on spots that are dry enough, scrub is virtually ubiquitous, and this should also be the case in Highland Scotland in the absence of heavy grazing – few bogs in Scotland are uniformly wet peat without drier ridges and outcroppings. Scattered peat bog scrub (at all elevations) is perhaps another habitat which might be considered lost in Scotland.



Figure8a. Coastal montane blanket bog in Nordmore, June 2011. The photograph was taken looking ENE at about 63.256N , 8.847E, elevation 440m asl. Note scrub woodland on slopes and on all drier patches of the blanket bog. The scrub zone elevation is here relatively low in part because of latitude and in part because of wind, the site being c. 17km W from the main coastline. Underlying geology is quartz diorite of the Caledonian orogeny.

While all of this is so obvious to anyone with reasonable experience of both Scotland and Norway to make one surprised by the perseverance with which attempts to explain away the parallel are occasionally made in Scotland, it is (for the moment) not so simple to document in the quantified terms which can be demanded by various authorities, Scotland being a country with a highly bureaucratized and metrics-obsessed public sector. I hope here to have provided some useful information, but it would be better if the comparison were put on a more rigorous basis through structured comparative research.

There is of course little interest in Scottish landscape comparisons in Norway – it is, after all, your problem. In Scotland, which ought to have a serious interest in the comparison for all sorts of conservational, social and economic reasons, nobody seems to have had the will to put up the money to do a serious comparative study. I would suggest there is a rich field of research here and would urge someone to do it; various funding schemes are available if SNH (the obvious organization that ought to be interested) has other priorities, notably the EU's IEF programme which will fund a post-PhD candidate to do up to two year's full time research in Norway, at Norwegian rates of pay⁹.

If there is some systematic factor other than the differences in human landuse history which can explain the presence and recent expansion of the montane scrub zone everywhere in Norway at suitable elevations in all climates, when it is functionally extinct in

⁹ Norway is in the programme, though not in the EU.

Scotland, it should be demonstrated by rigorous comparative study rather than vaguely asserting (usually wrongly) that some feature or other is different in 'Norway'¹⁰, and implicitly that the correlation implies causation. Montane scrub occurs in some form almost everywhere else with a climatic treeline, in the absence of heavy and historically durable anthropogenic browsing pressures. The default assumption must be that this would be the case in Scotland as well; claims of exceptionalism in this, as any area, need to be solidly backed before they can be accepted.



Figure 8b. Closeup of patch of scrub in montane blanket bog at Nordmore site in previous picture. Note mix of small birches, willow, and juniper scrub. The willow scrub appears to be on slightly wetter microsites than the birch, and the juniper on drier, but this is a little studied vegetation association which would repay structured research. Sheep are seasonally grazed locally at low densities.

The evidence to the contrary is in fact overwhelming. Montane scrub of all kinds has been demonstrably vulnerable to anthropogenic browsing pressures in Norway, and elsewhere. Since, unlike Scotland, these pressures are now greatly diminished, montane scrub has in recent decades expanded greatly in Norway, and is expanding now; the more so in areas where the climate is most similar to Scotland, and deforestation was formerly greatest. In Scotland itself there are sufficient fragments clinging to sites inaccessible to browsing to clearly imply that they were much more extensive in the past and, were browsing pressure less, would be much more extensive now – the climate of cliffs is after all not significantly different to that of nearby slopes. The rapid development of montane scrub away from cliff sites in the enclosures at Ben Lawers (Mardon 2008) is further clear proof of the point. Further, the conclusion of genetic studies in Scotland, “the overall picture is of scattered populations of taxonomically discrete sub-arctic willow species representing fragments of a once more widespread habitat” (Scottish Montane Willow Research Group 2007), is not compatible with a view that montane willow has always been rare; populations must have been much larger in the past for the present genetic diversity to have been retained. Montane willow scrub has much more demanding habitat requirements than, e.g., montane

¹⁰ Next time someone makes an assertion about 'Norway', remember to ask 'which part?'

birch scrub, which would have been more extensive still. All of this is no doubt obvious to most readers of the *Scrubber's Bulletin*, but the old revisionist theory is sometimes still heard.

Structured investigations of the processes that have led to the current stark differences between Highland Scotland and south and west Norway would in any case be instructive, and should be carried out.

References

- Blom, H.H. 2007.** Gjengroing av kulturlandskapet – konsekvenser for biologisk mangfold? (Regeneration (*of woodland*) on cultural landscapes – consequences for biological diversity?) *Viten fra skog og landskap* 2: 47-51
- Bryn, A. 2008.** Recent forest limit changes in south-east Norway: Effects of climate change or regrowth after abandoned utilisation?, *Norsk Geografisk Tidsskrift - Norwegian Journal of Geography*, 62:4, 251-270
- Bryn, A. & Debella-Gilo, M. 2011.** GIS-based prognosis of potential forest regeneration affecting tourism locations and cultural landscapes in South Norway. *Scandinavian Journal of Hospitality and Tourism* 11: 166-189.
- Mardon, D.K. 2008.** Montane scrub and treeline woodland restoration at Ben Lawers NNR: a progress report to 2007. *Scrubber's Bulletin* No.7.
- Rekdal, A. 2010a.** Skjøtsel av fjellbjørkeskog for husdyrbeite (Management of montane birch woodland for livestock grazing). *Sau og geit* 63: 28-30
- Rekdal, Y. 2010b.** Attgroing kan ikkje stoppast (Regeneration is unstoppable). *Nationen* (newspaper) 30th March
- Scottish Montane Willow Research Group. 2007.** Biodiversity: taxonomy, genetics and ecology of sub-arctic willow scrub. *Scrubber's Bulletin* No.6.

COMMON BIRDS OF MONTANE SCRUB AND THEIR POTENTIAL TO RECOLONISE RESTORED HABITAT IN SCOTLAND

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Fig 1. Male red-spotted bluethroat *Luscinia svecica* – the ‘meadow pipit’ of montane scrub

Highland Scotland forms part of the breeding range of a number of species of bird which have their main ranges in Scandinavia and sometimes eastwards across northern Eurasia, for example red-throated and black-throated diver, common scoter, red-necked phalarope, greenshank, dotterel, whimbrel, capercaillie, snow bunting, redwing, and twite¹¹. As one would expect, the availability and extent of suitable habitat in Scotland appears to be the main determinant of presence and abundance. This is of course influenced by climate, which limits the possible vegetation types which can develop. Species of the various habitats of the arctic-alpine zone, above the natural limit of montane scrub, have rather frequently colonised from Scandinavia and/or become extinct again. These species are particularly vulnerable to the effects of small variations in summer weather conditions and of random variations in breeding and mortality in their naturally small populations, given the low densities at which they breed and the naturally restricted quantity of the required habitats in Scotland. Examples include Snow bunting and Purple sandpiper.

¹¹ For a fascinating exploration on a wider scale of Scotland considered as the ‘south of the north’ see “Nature in Northern Europe” (Hallanaro & Pylvanainen (Eds.) 2002), which deals with Iceland, Scotland, Fenno-Scandia, the Baltic States and NW Russia considered as a unit.

However, the effect of land management on habitat availability is also a most important factor. A number of species formerly extinct as breeders in Scotland have (re)colonised Scotland since the mid 19th century as forest cover, particularly planted coniferous forest, has spread. Some of these, such as green and great spotted woodpeckers, have recolonised from England, while others are of Scandinavian origin. Woodcock, now common in many kinds of woodland, was only a winter visitor, it appears mainly from Fenno-Scandia, before the mid 19th century; goldeneye (a duck breeding naturally in tree holes in old conifers) with the assistance of nest boxes; wood sandpiper on forest bogs; while capercaillie, a very sedentary species, was reintroduced (from 1837). More recently redwing and parrot crossbills have established in parts of the central Highlands and fieldfare, brambling, wryneck of Scandinavian origin, green sandpiper, Temminck's stint, and Mealy redpoll have all bred sporadically (see also below). Siskin and Common crossbill also appear to have recolonised naturally from Scandinavia, as spruce plantations became established in the 19th century, though they may have persisted unnoticed in small numbers in relict Caledonian pine forests.

Colonisation has also happened in the opposite direction, species associated with low-lying bushy habitats and younger woodland (e.g. stonechat, lesser redpoll) having colonised coastal southwest Norway from Britain in recent decades, as coastal scrub and woodland has reestablished following the steep declines in grazing pressure that occurred there during the 20th century (Halley 2011).

From this it is clear that, given a reasonable – or even rather restricted - extent of appropriate habitat, (re)colonization of birds from Scandinavia occurs fairly readily, the exception being where the species is sedentary in its habits, like capercaillie. Species occupying habitats above, and species occupying habitats below, montane scrub in altitudinal range have done so.

Montane scrub is a habitat type even more reduced in extent than coniferous forest once was; for centuries it has been, as it remains today, functionally extinct as a habitat. It is a habitat type which has its own characteristic assemblages of herbaceous vegetation and invertebrates¹², and birds; the birds being perhaps more vulnerable to extinction as they require larger areas of habitat for a viable population to persist. Some species are abundant in montane scrub and can breed at high densities. There is no reason to suppose that they would be any less able to spread to Scotland than other species of bird from Scandinavia, which live in habitats both above and below montane scrub in altitudinal range, have been - were the appropriate habitat to become available in reasonable quantity.

In this article I discuss the common bird species of montane scrub in Scandinavia, which may spread to Scotland, or become more common as breeders, if suitable habitat becomes available; along with an assessment of the likelihood of spread based on factors such as typical breeding densities, adaptability within the habitat type, and patterns of movement, all of which affect the potential of a species to spread to new patches of habitat geographically remote from current populations. Of course, restoring the habitat itself is and should be the main goal. The characteristic birds of the montane scrub, however, are interesting in themselves, and elements of the complete montane scrub assemblage. Many are attractive to look at and and/or have beautiful songs. They are thus of value not only conservationally, but also as 'flagship' species for the habitat; and - not least - for public enjoyment.

¹² It would seem likely that many of these species may have become extinct in Scotland as well, and would find natural recolonisation more difficult than birds. For example, Blue sow-thistle is extremely rare in Scotland but very abundant in montane scrub in Norway; less common montane scrub-associated herbaceous plants may well have become extinct in Scotland. The same would apply to invertebrates.

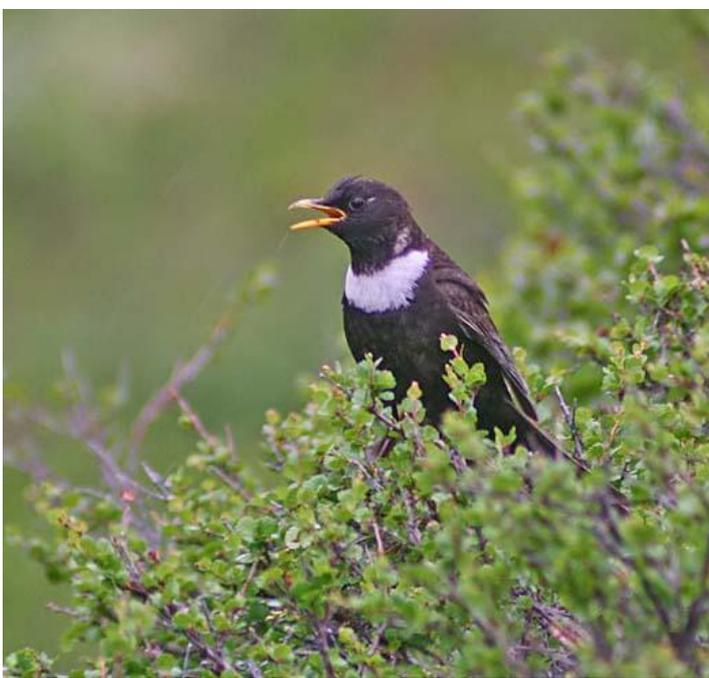


Fig 2. Ring ouzel *Turdus torquatus* male.

The **Ring ouzel** (*Turdus torquatus*) breeds in Scotland, but is Red Listed because of a severe decline in populations, of over 50% in the last 25 years, and a very marked contraction in range (Rollie 2007). The same subspecies (*T.t. torquatus*) breeds in Scandinavia. There, it is a bird of ecotones: the core habitat mix for the species is a mosaic of montane or coastal scrub with patches of grass and rocks. “In Norway the ring ouzel occurs in higher-lying areas over most of the country. It is thus common in the willow region (*ie the upper zone of montane scrub*)....From Lista (*extreme SW Norway*) and northwards it also breeds

at many sites right out on the coast....The Ring ouzel prefers hilly areas with rocky terrain and mixed grass and shrub vegetation. Here it especially likes rock outcrops, cliffs, and canyons. It especially likes steep slopes with lots of rocks and plenty of juniper bushes, where at the same time there are mixed in more open areas with grass. It does not like barren areas with little vegetation, either on the coast or in the mountains” (Pedersen 1994a).

In Scotland ring ouzels are found in “open heather clad moorland and mountains with only very sparse or stunted tree cover” (Rollie 2007); “mainly in steep sided valleys, crags and gullies” (RSPB website), the latter not coincidentally the places where scattered bushes sometimes persist on ledges out of range of browsing animals.

Montane/coastal scrub as a major element of the preferred habitat mix is not mentioned in the Scottish habitat descriptions because it hardly exists there.

There is no shortage of rocks or grassy patches in upland Scotland, but a central element of the core habitat mix, montane (or rocky coastal) scrub, is almost completely missing. In Norway the species seems to be much more common in hill and rocky coast landscapes than is the case

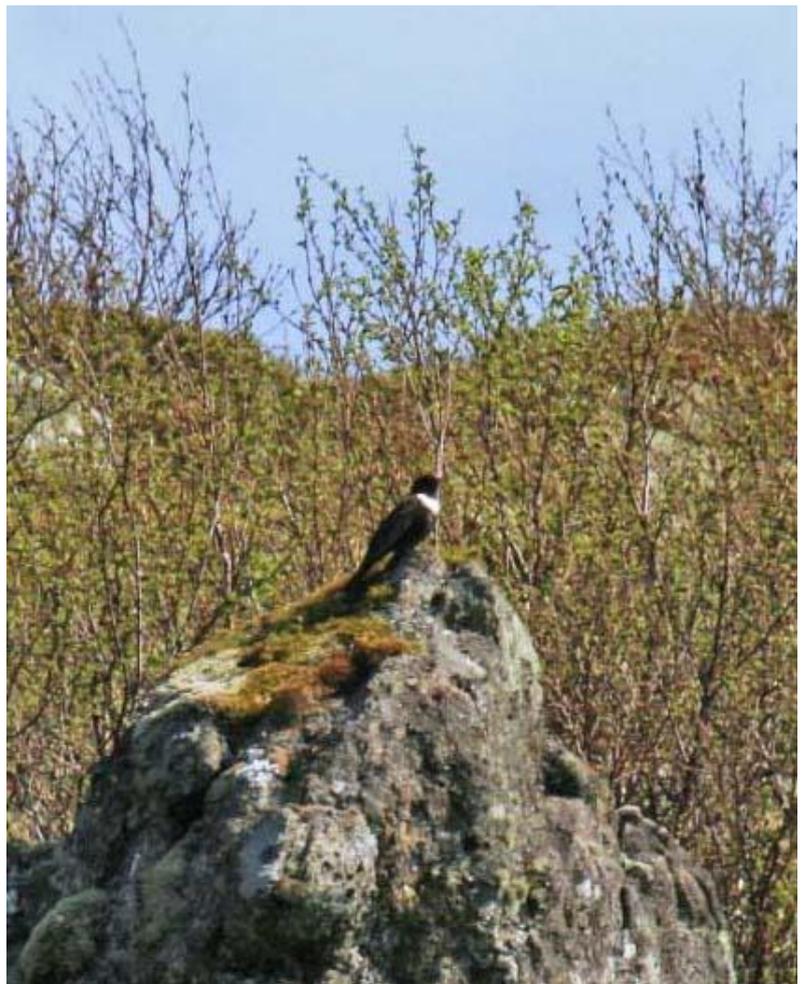


Fig 3. Ring ouzel in typical Scandinavian habitat.

in Scotland; it is frequently found on relatively modest slopes with scattered rocks, but almost always with a large and often a predominant element of scrub as well. Almost all 'rock outcrops, cliffs, and canyons' at suitable elevations in Norway contain and/or are surrounded by a large element of scrub.

While populations in Scotland and elsewhere in Britain have been falling sharply and the species is Red Listed, there is no evidence of any similar change in Norway and the conservation status is 'Least Concern', the most favourable IUCN classification of all (Norwegian Biodiversity Information Centre¹³). In Rogaland (SW Norway) there have been some local declines, associated with birch woodland regeneration after relaxation in domestic grazing pressures passing beyond the shrub stage (Carlsson et al 1988). However, overall the population appears stable at 10,000-100,000 pairs (Pedersen 1994a), and it may be expected to slowly increase as montane and coastal scrub associations continue to regenerate on areas formerly deforested by high levels of domestic stock grazing (Bryn & Debella-Gilo 2011).

Encouragement in Britain of the regeneration of montane scrub associations in areas with otherwise suitable habitat features would clearly be one key element in restoring populations of this Red Listed species. It will be more robust to other environmental perturbations if its core habitat mix, rather than relatively poor fringe habitat lacking a sufficient scrub element, were more widely available¹⁴.



Fig 4. Red-spotted bluethroat female in montane willow scrub.

The **Bluethroat** (red-spotted subspecies, *Luscinia svecica svecica*) is the characteristic species of the montane scrub zone, especially but by no means exclusively of relatively short, higher lying birch and/or willow-dominated montane scrub, even only calf-high, and in a variety of other species assemblages given the same general type of growth form and elevation. Usually only willow warblers are of similar abundance in these habitats. In terms of ubiquity and commonness, this is the

'meadow pipit' of montane scrub. In Norway alone the population is estimated at between 500,000 and 1,000,000 pairs (Thingstad 1994), or perhaps 4-8 million individuals in autumn. The population appears to have increased in recent decades, presumably due to the considerable spread of suitable habitat in Scandinavia over the period (Halley 2011). It

¹³ <http://www.biodiversity.no/frontpage.aspx?m=23>

¹⁴ The causes of the decline in Scotland are unclear, but long terms effects of the loss of scrub cover on the fertility of soils in ring ouzel habitat is a plausible factor in the decline.

is mainly insectivorous, and occurs throughout the montane scrub zone, from the far south of Norway, on the same latitude as northern Scotland, to the extreme north. In northern Norway the species is sometimes found in similar birch-dominated scrub on outer coasts and islands as well (op. cit; pers. obs.); at these latitudes the distinction between coastal and montane scrub in elevation, vegetation assemblages, and summer climate becomes ever less discernable. The same subspecies is also found in similar habitat in mountains of central Europe (where it segregates by habitat from the lowland marsh breeding white-spotted subspecies, *L.s. cyanecula*).

It is robust to variations in summer climate, from relatively dry regions in the east of Norway and in Sweden to sites near the west coast with summer temperatures remarkably similar to, and rainfall exceeding, the western Highlands. In autumn the species migrates to Mediterranean or subtropical climates, in a broad band from Spain eastwards to the Indian subcontinent; and across the Sahara. The Scandinavian population migrates in a generally ESE direction (Thingstad 1994; Ellegran & Wallin 1991).

The Scandinavian subspecies male is in the opinion of many the most beautiful of all European small birds. It is also a most accomplished singer, the song described by the *Birds of the Western Palaearctic* as the species' "most outstanding feature...loud, sweet, and exceptionally varied"¹⁵. The female is more cryptic, but both sexes have bright chestnut patches at the base of the outer tail feathers, frequently cocked and fanned. Males sing for long periods from prominent perches for about a fortnight after arrival in spring; thereafter the species is more skulking, but nevertheless moves in the open in a confident, perky manner like a slim elongated robin. When young are in the nest adults make loud distraction calls when potential predators (including humans) are nearby, and then often show themselves prominently.

The general WNW orientation of spring migration results in Scandinavian Bluethroats migrating in some numbers through Scotland every spring; the first I ever saw were a spectacular fall of over 100 males on the Isle of May in April 1985. As a migrant the species 'behaves in a skulking manner' (Thingstad 1994), so the several hundred typically reported during spring migration in Britain every year are likely to be a small fraction of the actual numbers moving through. Pairs have been found breeding in scrub, e.g. at Insh Marshes (twice) and near Tomatin, but always well below montane scrub elevations (Harvey 2007); and singing males have also been noted sporadically without breeding being confirmed. The RSPB website estimates the breeding population at "0-1 pairs". As their specialist habitat in montane scrub is lacking at present no permanent breeding population has been able to establish. Conditions seem very similar as for other migrant small passerines that



Fig 5. Bluethroat chicks in nest.

¹⁵ Recordings of the song are available at <http://www.xeno-canto.org/browse.php?query=Bluethroat+%28Luscinia+svecica%29+41>

have colonized Scotland in the last 150 years as suitable habitat became available; all that seems to be required for recolonisation is a large enough extent of montane scrub in Scotland, and enough time¹⁶. Densities of up to 58 pairs/km² have been recorded, with densities of 30-40 pairs/km² in favourable habitat being common. A relatively conservative rule of thumb in conservation biology is that a population of about 25 breeding pairs of a species is needed for a viable population (Caughley & Sinclair 1994). The recovering montane scrub at Ben Lawers already appears to be at or near the extent needed to sustain a population of that size (Mardon 2008).

The **Mealy redpoll** *Carduelis flammea flammea* used to be considered conspecific with the Lesser redpoll *Carduelis cabaret*, but *cabaret* was 'split' from *C. flammea* a few years ago and is now considered a separate species. The Mealy redpoll is one of three recognized subspecies of *C. flammea*. It is of nomadic and irruptive habits and winters in variable numbers in eastern Britain. Males are attractive birds in the breeding season, the plumage strongly flushed with red.

Habits are very similar to the siskin, but preferring birch and willow to spruce. In Norway, Mealy redpolls "preferentially breed in the birch belt (*ie birchwoods above the coniferous forest limit, and the*



Fig 6. Mealy redpoll *Carduelis flammea flammea* male (front) and female.

lower montane scrub zone), where the nest is constructed in a birch. Above the birch belt (*ie in the upper montane scrub zone, typically dominated by willow*) the nest is readily constructed in a willow, or right on the ground" (Røer 1994). The species feeds mainly on small wind-dispersed deciduous tree seeds and is nomadic, breeding wherever the seed supply is sufficient. In some years it seems to be capable of breeding twice in distinct locations, first in montane scrub in spring, and then in late summer in lower level birchwoods (*op. cit.*). This is an abundant species, although populations in Norway vary widely depending on seed supplies. "The population in a good year is very large, the number of pairs probably being in 6-7 figures" (*op. cit.*), which would imply an autumn population of several million to over 10 million birds.

¹⁶ Given a large enough habitat patch an active reintroduction would be technically simple to achieve and would probably reduce time-to-recolonisation considerably, given the chancy nature of simultaneous initial discovery of small and isolated habitat patches by male and female migrants, and of the early stages of establishment of subsequent generations. Juveniles could be mist netted in southern Norway after they become independent in later July, held for 40 days quarantine on site (for legal reasons), and released to migrate out. Assuming the normal migration behaviour of insectivorous passerines, they would return to the area the following spring to breed.

The nomadic breeding pattern of the species, regular though variable wintering in Britain, and preference for nesting in high-altitude birchwoods (above the coniferous treeline) and in montane scrub of various kinds, suggests that colonisation would be very likely if significant areas of suitable habitat were to become available. It has bred once in mainland Scotland, 8 pairs in a pine plantation in Sutherland in 2000; and several times in Orkney and Shetland, mainly in gardens with bushes (Pennington 2007).

The **Lapland bunting (aka Lapland longspur)** *Calcarius lapponicus* bred in Scotland from 1977-80, up to 16 pairs in one year; but has not bred since (McNee 2007). The male is an attractive bird with a striking black, white and chestnut head pattern, which sings a short but sprightly song¹⁷ in display flight from a prominent perch on a bush or rock. In Norway it is primarily a bird of the upper dwarf montane scrub. "In the mountain areas of southern Norway the Lapland bunting breeds from ca. 650m to 1200-1300m, most commonly in the willow zone It prefers infertile mountain areas with crowberry, dwarf birch, and a deal of willow, but also the edge of larger bog complexes which are surrounded by more infertile vegetation types. It is also found in areas with large stones which are used for song posts". Within these habitat types it is a common bird from the far south of Norway (Setesdal) northwards, with the main concentrations in south Norway and in Finnmark. The population is estimated as stable at 200,000 – 500,000 pairs. In a few places it also breeds in very short, windblown coastal scrub associations as far south as More og Romsdal. In favourable habitat it can breed at up to 24-26 pairs/km² (Breihagen 1994). It is a migrant, most Scandinavian birds moving SE or ESE to warmer steppe biotopes in Ukraine and Russia though some may winter, with birds from Greenland, around the North Sea coast.

The Scottish birds bred in fringe habitat for the species, summit plateaus in the eastern Highlands lacking in any element of montane scrub (McNee 2007).

The ability of the species to colonise Scotland is clear since it has already happened. Colonisation appears to have been possible because the species can tolerate scrubless areas with large stones in some circumstances. The core habitat is, however, upper level montane scrub associations; it can therefore be expected to colonise these if they become available in Scotland.

The **Brambling** *Fringilla montifringilla*. The size and general shape of a chaffinch, of which it is the northern/mountain counterpart, the male is again an attractive bird to look at, and has an engaging mating 'dance'; it is otherwise distinguished by having perhaps the most uninteresting song of any bird, a depressed-sounding monosyllabic "chirr" uttered several times a minute through much of the day¹⁸. In Norwegian, this is the 'birch finch' (bjørkefink); it breeds abundantly in appropriate habitat from the extreme south to the far north of Norway. Although it can breed in conifers and at lower elevations, the core habitat is mountain birchwood and scrub above the conifer treeline: "the brambling is one of the

¹⁷ <http://www.xeno-canto.org/browse.php?query=Lapland+Longspur+%28Calcarius+lapponicus%29+26>

¹⁸ <http://www.xeno-canto.org/browse.php?query=brambling>

commonest birds of montane birchwoods. It breeds as far north and as far up the mountain as birch is found. The species breeds only sparsely on lower ground". The population in Norway is thought to exceed 1,000,000 pairs; in montane birch the breeding density is typically 30-100 pairs/km² (Reitan 1994). It is a nomadic breeder; while territorial, it shows little site fidelity between years.

Bramblings are common winter visitors to Britain, and the species has bred sporadically in Scotland at widely scattered locations, at least 10 pairs, of which 8 since 1979 (Newton 2007). Again, the core habitat of the species – birch at elevations above the conifer treeline – is absent from Scotland, and it would seem likely that the species would be likely to establish on a more permanent footing if this habitat became available. Recent (re)colonisation of Iceland¹⁹, 970 km from Scandinavia and 741km from Britain at the nearest point, demonstrates the ability of the species to spread to small and remote patches of habitat.²⁰



Fig 8. Brambling *Fringilla montifringilla* male.

The **Yellow wagtail** *Motacilla flava* has a number of well-marked races inhabiting distinct kinds of habitat. In England and locally in southern Scotland *Motacilla flava flavissima* breeds in lowland water meadows, wetland fringes, etc., preferably near shallow surface water (Murray 2007).

In Scandinavia the dark-headed *Motacilla flava thunbergi* ("Grey-headed wagtail") has a quite distinct habitat choice: "it prefers the birch zone in the mountains (ie above the conifer tree line) ...the southern (*M.f. flava*) and English (*M.f. flavissima*) subspecies of yellow wagtail (which breed in small numbers in lowland south Norway) have completely different habitat requirements" (Paulsen 1994). The Norwegian population is estimated at 100,000-500,000 pairs. It dislikes very wet summer climates, avoiding the parts of Norway with highest rainfall on the west coast, but breeds in many areas with similar summer rainfall to the central and eastern Highlands. It feeds on small invertebrates by picking from the grass

¹⁹ The 'Islendingabók' (The Saga of the Icelanders) states that at the time of human colonization in the 9th century "At that time Iceland was covered with woodland between mountain and seashore", a statement confirmed by archaeology. These were mainly birchwoods and willow scrub; deforestation by unrestricted livestock browsing and direct human exploitation proceeded rapidly. This had far-reaching effects in the mild and very wet climate, in particular resulting in massive erosion of soils in coastal areas (Byock 2001). Heavy browsing prevented regeneration until the 20th century. Exotic plantations of conifers, and environmental restoration of birch and willow, has recovered woodland extent to some degree in recent decades.

²⁰ The statement in Newton (2007) that the species is retreating northwards in Fenno-Scandia is incorrect, at least for Norway, where populations are apparently stable and the bird common in appropriate habitat in the extreme southwest, on the same latitude as northern Scotland.



Fig 9. Scandinavian race yellow wagtail *Motacilla flava thunbergi* male in typical montane scrub habitat.

sward in open patches and by flycatching, typically from a perch high on a bush. Nearby water is not necessary.

I recall having difficulty in believing the first *thunbergi* yellow wagtails I saw in Norway were yellow wagtails, the habitat being so 'wrong'. In Norway *thunbergi* has a different vernacular name to the other two subspecies. *M.f. flavissima* and *M.f. thunbergi* (combined with other subspecies in each case) are sometimes considered to be distinct species.

The Scandinavian population is a trans-Saharan migrant, with movement on a broad front. However, relatively few birds are seen moving through Scotland on migration most years, though in some years there are much larger falls. Breeding has occurred on five occasions at passage sites (coastal and islands in Scotland), but has not been recorded in the Highlands (Murray 2007). Colonisation, if suitable habitat were available, would presumably be less likely than for some other species given the smaller numbers of passage birds, except perhaps in the longer term; but the central and eastern Highlands are climatically quite suitable at appropriate elevations.

The thrushes **Redwing** *Turdus iliacus* and **Fieldfare** *Turdus pilaris* both breed in Highland Scotland. The redwing colonised permanently in small numbers (40-80 pairs) from 1967 (Storie 2007); and fieldfare breed sporadically, up to 5 pairs in a given year in widely scattered locations but with no permanently established population (Patterson 2007). Both winter in large numbers. In Norway both these species breed very commonly (redwing 1-1.5 million pairs; fieldfare 1-3 million pairs) in all kinds of woodland and woodland edge from the coast to the upper limits of the montane scrub zone and throughout the country. Scrub or woodland with a bushy understory is strongly preferred by redwings, and redwings are among the commonest birds of montane birch above the coniferous treeline (Pedersen 1994b).



Fig 10. Redwing *Turdus iliacus*



Fig 11. Fieldfare *Turdus pilaris*

Fieldfares like a significant element of open ground, and are relatively common in montane willow, where they typically nest in rather loose colonies of from a few to up to 40-50 pairs, and forage both there and in surrounding more open habitats (Pederson 1994c). In Scotland, establishment of montane scrub may benefit both species by providing habitat above the climatic limit of competitor 'southern' thrush species such as blackbird and mistle thrush.

The Scandinavian **Willow tit** *Poecile montana borealis* (with the very similar Alpine mountain subspecies) is sometimes considered a separate species from southern/lowland subspecies. Habitat choice differs

between the two forms; the Alpine and lowland forms have different songs and avoid crossbreeding on their line of contact. *P.m. kleinschmidti* breeds in small numbers in damp, low-lying woodland with a dense understory in southern Scotland (Maxwell 2007). *Borealis* is distinctly larger, much greyer, and inhabits quite different habitat. It is the only tit of montane birch scrub, and also the commonest tit species in both pine and spruce forest throughout Scandinavia (Hogstad 1994).

It is very implausible that *borealis*, the common tit of conifer zone forest and montane birch woodland throughout the Palaearctic, did not colonise Britain after the last ice age when many other non-migratory, less mobile, and much less abundant animal species of the same habitat types did. It probably became extinct unnoticed in Scotland several hundred years ago, when montane scrub was extinct as a habitat and pine forest was reduced to isolated fragments (crested tit *Lopophanes christatus*, a coniferous forest specialist, was first mentioned as inhabiting Scotland in 1789, though as a very sedentary, non-migratory species it was almost certainly present from post-ice age times). It is also dependent on soft dead stumps in which to excavate nest cavities. These would have been rare given the relatively high human population on the land and the demand for fuel wood.



Fig 12. Willow tit *Poecile montana borealis*

Competition with the larger, dominant crested tit – also a hole-excavator – for any suitable stumps remaining would have been intense, further increasing extinction pressures.

Natural (re)colonisation of Scotland is unlikely since it is non-migratory; there are no unequivocal records of vagrant *P.m.borealis* from Scotland.

The **Wood sandpiper** *Tringa glareola* has bred in Scotland since 1959 in small numbers (currently estimated at 18-21 pairs), mainly in marshes and swamps which are usually close to large lochs (Kalejta-Summers & Chisholm 2007). While it also breeds sparsely in similar places in Norway, it is found “especially in the birch and willow zone (*i.e.* above the coniferous forest limit) ... the species is



Fig 13. Wood sandpiper *Tringa glareola*

... tied to boggy areas, preferably with scattered trees” (Sæther 1994). The establishment of montane scrub near bogs (a common conjunction in Scandinavia, as it would be in Scotland) would increase the potential habitat of this species, at the elevations it is known to prefer.



Fig 12. Wood sandpiper in wet scrub

The other common bird species of montane scrub of all kinds are the **Willow warbler** *Phylloscopus troichilus*, **Reed bunting** *Emberiza schoeniclus*, **Tree pipit** *Anthus trivialis*, **Cuckoo** *Cuculus canorus*, and **Willow grouse** *Lagopus lagopus*. **Dunnock** *Prunella modularis* is common in montane birch scrub. These are all common in Scotland (and Norway) in other habitats, willow grouse as the British subspecies, red grouse *L.l. scoticus*; and will presumably move in to montane scrub as soon as it is available. **Black grouse** *Tetrao tetrix*, which is Red Listed in Britain, breeds commonly from sea level to the conifer tree line, and somewhat less commonly in montane birch scrub, in Norway. Montane birch populations move to lower ground in winter.

Apart from the factors outlined above, the other major influence on the likelihood of colonisation and the probability of a population becoming permanently established is the extent of suitable habitat available. The greater the extent, the more likely potentially colonising species will be to find it, and the larger the population it can sustain.

REFERENCES

- Breihagen, T. 1994.** Lappspurv (*Lapland bunting*) *Calcarius lapponicus*. pp 492-493 in: Gjershaug, J. O., Thingstad, P. G., Eldøy, S. & Byrkjeland, S. (eds.): Norsk fugleatlas (*Norwegian Bird Atlas*). Norsk Ornitologisk Forening, Klæbu.
- Bryn, A. & Debella-Gilo, M. 2011.** GIS-based prognosis of potential forest regeneration affecting tourism locations and cultural landscapes in South Norway. *Scandinavian Journal of Hospitality and Tourism* 11: 166-189.
- Byock, J. 2001.** Viking Age Iceland. Penguin, London.
- Carlsson, O.; Efteland, S. ; Hauge, K.O., Paulsen, B.E., Roalkvam, R. & Storstein, B. 1988.** Fugleatlas for Rogaland (Bird atlas for Rogaland). *Falco* supplement 2. 405pp.
- Caughley, G. & Sinclair, A.R.E. 1994.** Wildlife ecology and management. Blackwell Science, Cambridge.
- Ellegren, H. & Wallin, K. 1991.** Autumn migrating Bluethroats *Luscinia svecica svecica* orient in an east-southeastern direction at Gävle, eastern Sweden. *Ornis svecica* 1: 47-50.
- Hallanaro, E.L. & Pylvanainen, M. 2002.** Nature in Northern Europe – biodiversity in a changing environment. Nordic Council of Ministers.
- Halley, D.J. 2011.** A parallel universe – montane scrub depletion and regeneration in coastal southwest Norway. *Scrubber's Bulletin* No.9
- Harvey, P. 2007.** Bluethroat *Luscinia svecica*. Pp 1086-1092 in: Forrester, R.W., Andrews, I.J., McInerney, C.J., Murray, R.D., McGowan, R.Y., Zonfrillo, B., Betts, M.W., Jardine.D.C. & Grundy, D.S. (eds.) *The Birds of Scotland*. The Scottish Ornithologist's Club, Aberlady.
- Hogstad, O. 1994.** Granmeis (*willow tit*) *Parus montanus*. pp 416-417 in: Gjershaug, J. O., Thingstad, P. G., Eldøy, S. & Byrkjeland, S. (eds.): Norsk fugleatlas (*Norwegian Bird Atlas*). Norsk Ornitologisk Forening, Klæbu.
- Kaletja-Summers, B & Chisholm, K. 2007.** Wood sandpiper *Tringa glareola*. Pp 700-703 in: Forrester, R.W., Andrews, I.J., McInerney, C.J., Murray, R.D., McGowan, R.Y., Zonfrillo, B., Betts, M.W., Jardine.D.C. & Grundy, D.S. (eds.) *The Birds of Scotland*. The Scottish Ornithologist's Club, Aberlady.
- Mardon, D.K. 2008.** Montane scrub and treeline woodland restoration at Ben Lawers NNR: a progress report to 2007. *Scrubber's Bulletin* No.7.
- McNee, A.F. 2007.** Lapland longspur *Calcarius lapponicus*. pp 1469-1472 in: Forrester, R.W., Andrews, I.J., McInerney, C.J., Murray, R.D., McGowan, R.Y., Zonfrillo, B., Betts, M.W., Jardine.D.C. & Grundy, D.S. (eds.) *The Birds of Scotland*. The Scottish Ornithologist's Club, Aberlady.
- Maxwell, J. 2007.** Willow tit *Poecile montana*. pp1029-1035 in: Forrester, R.W., Andrews, I.J., McInerney, C.J., Murray, R.D., McGowan, R.Y., Zonfrillo, B., Betts, M.W., Jardine.D.C. & Grundy, D.S. (eds.) *The Birds of Scotland*. The Scottish Ornithologist's Club, Aberlady.
- Murray, R. 2007.** Yellow wagtail *Motacilla flava*. pp1029-1035 in: Forrester, R.W., Andrews, I.J., McInerney, C.J., Murray, R.D., McGowan, R.Y., Zonfrillo, B., Betts, M.W., Jardine.D.C. & Grundy, D.S. (eds.) *The Birds of Scotland*. The Scottish Ornithologist's Club, Aberlady.
- Newton, I. 2007.** Brambling *Fringilla montifringilla*. pp 1389-1392 in: Forrester, R.W., Andrews, I.J., McInerney, C.J., Murray, R.D., McGowan, R.Y., Zonfrillo, B., Betts, M.W., Jardine.D.C. & Grundy, D.S. (eds.) *The Birds of Scotland*. The Scottish Ornithologist's Club, Aberlady.

- Patterson, D.J. 1997.** Fieldfare *Turdus pilarus* pp 1154-1158 in: Forrester, R.W., Andrews, I.J., McInerney, C.J., Murray, R.D., McGowan, R.Y., Zonfrillo, B., Betts, M.W., Jardine.D.C. & Grundy, D.S. (eds.) The Birds of Scotland. The Scottish Ornithologist's Club, Aberlady.
- Paulsen, B.E. 1994. Gulerle (*Yellow wagtail*) *Motacilla flava*. pp 334-335 in: Gjershaug, J. O., Thingstad, P. G., Eldøy, S. & Byrkjeland, S. (eds.): Norsk fugleatlas (*Norwegian Bird Atlas*). Norsk Ornitologisk Forening, Klæbu.
- Pennington, M. 2007.** Common redpoll *Carduelis flammea*. pp1417-1419 in: Forrester, R.W., Andrews, I.J., McInerney, C.J., Murray, R.D., McGowan, R.Y., Zonfrillo, B., Betts, M.W., Jardine.D.C. & Grundy, D.S. (eds.) The Birds of Scotland. The Scottish Ornithologist's Club, Aberlady.
- Pedersen, F.H. 1994a. Ringtrost (*Ring ouzel*) *Turdus torquatus*. pp 364-365 in: Gjershaug, J. O., Thingstad, P. G., Eldøy, S. & Byrkjeland, S. (eds.): Norsk fugleatlas (*Norwegian Bird Atlas*). Norsk Ornitologisk Forening, Klæbu.
- Pedersen, F.H. 1994b.** Rødvingtrost (*Redwing*) *Turdus iliacus*. pp 372-373 in: Gjershaug, J. O., Thingstad, P. G., Eldøy, S. & Byrkjeland, S. (eds.): Norsk fugleatlas (*Norwegian Bird Atlas*). Norsk Ornitologisk Forening, Klæbu.
- Pedersen, F.H. 1994c. Gråtrost (*Fieldfare*) *Turdus pilaris*. pp 368-369 in: Gjershaug, J. O., Thingstad, P. G., Eldøy, S. & Byrkjeland, S. (eds.): Norsk fugleatlas (*Norwegian Bird Atlas*). Norsk Ornitologisk Forening, Klæbu.
- Reitan, O. 1994.** Bjørkefink (*Brambling*) *Fringilla montifringilla*. pp 462-463 in: Gjershaug, J. O., Thingstad, P. G., Eldøy, S. & Byrkjeland, S. (eds.): Norsk fugleatlas (*Norwegian Bird Atlas*). Norsk Ornitologisk Forening, Klæbu.
- Rollie, C. 2007.** Ring ouzel *Turdus torquatus*. pp 1130-1134 in: Forrester, R.W., Andrews, I.J., McInerney, C.J., Murray, R.D., McGowan, R.Y., Zonfrillo, B., Betts, M.W., Jardine.D.C. & Grundy, D.S. (eds.) The Birds of Scotland. The Scottish Ornithologist's Club, Aberlady.
- Rør, J.E. 1994.** Gråsisik (*Redpoll*) *Carduelis flammea*. pp 474-475 in: Gjershaug, J. O., Thingstad, P. G., Eldøy, S. & Byrkjeland, S. (eds.): Norsk fugleatlas (*Norwegian Bird Atlas*). Norsk Ornitologisk Forening, Klæbu.
- Sæther, S.E. 1994.** Grønnstilk (*Wood sandpiper*) *Tringa glareola*. pp 216-217 in: Gjershaug, J. O., Thingstad, P. G., Eldøy, S. & Byrkjeland, S. (eds.): Norsk fugleatlas (*Norwegian Bird Atlas*). Norsk Ornitologisk Forening, Klæbu.
- Storie, N.L. 1997.** Redwing *Turdus iliacus* pp 1154-1158 in: Forrester, R.W., Andrews, I.J., McInerney, C.J., Murray, R.D., McGowan, R.Y., Zonfrillo, B., Betts, M.W., Jardine.D.C. & Grundy, D.S. (eds.) The Birds of Scotland. The Scottish Ornithologist's Club, Aberlady.
- Thingstad, P.G. 1994.** Blåstrupe (*Bluethroat*) *Luscinia svecica*. pp 352-353 in: Gjershaug, J. O., Thingstad, P. G., Eldøy, S. & Byrkjeland, S. (eds.): Norsk fugleatlas (*Norwegian Bird Atlas*). Norsk Ornitologisk Forening, Klæbu.

The Montane Scrub Action Group – an Update

Diana Gilbert, Chair MSAG

It is now 16 years since the group was initiated following the first Montane Scrub Restoration conference at SNH's Battleby Centre. Last autumn (2010) saw the closing conference for a successful 'Action for Mountain Woodlands' project, funded by the Heritage Lottery Fund. The conference brought the audience up to date with the outcomes and/or progress of recent Scottish-based research, aspects of current best-practise and discussed outstanding issues. The project, which had been initiated and steered by the group, primarily promoted wider interest in higher altitude woodlands through involving regular hill users in surveying; providing interpretation at popular Forestry Commission, SNH and Local Authority parks and reserves which are actively managing treeline woodland or montane scrub; and involving school children in propagating and planting new scrub areas in location which they can easily re-visit.

"Natural treelines" and "montane scrub" are now relatively common terms in upland land use agency speak and feature in a number of land strategies that extend to the uplands. There is no doubt that the MSAG can claim a degree of responsibility for this, but it may be premature to feel any serious sense of achievement. The 'Action for Mountain Woodlands' conference prompted us to discuss what MSAG has achieved so far and to identify the key outstanding issues that we may be able to, at least partly, address. This resulted in confirmation that our role is "To collate, stimulate, re-articulate and make available information about mountain woodlands", and that the following were the key current issues:

1. Treeline woodlands and montane scrub are still too isolated in policy terms and need to become embedded within any discussion about either forest or upland hill management.
2. The existing fiscal incentives are inadequate and that the next round of SRDP would ideally include a much more realistic package for treeline woodland / montane scrub.
3. To support the above there are a number of key requirements: information on best practice and case studies; development of plant material supply chains; research on remaining key information gaps.

In the summer of 2011 another project proposal was submitted to the Heritage Lottery Fund for a 'Mountain Woodland Restoration' Project. This will push forward development of best practise in treeline woodland establishment and management, and the MSAG will again be the key source of advice for the project sites, volunteers and practitioners with regard to survey and practical site management.

Recent changes in delivery of the national biodiversity obligations have stimulated a discussion about the value of a separate Woolly Willow Species Action Group (WWSAG), the outcome of which is the amalgamation of the MSAG and WWSAG. Although the groups have had quite different functions there is benefit to MSAG of including the additional knowledge and expertise of the WWSAG members, and to the WWSAG member through being part of a broader discussion about montane scrub. So it was with great pleasure that, at their last meeting, MSAG welcomed Dr Heather McHaffie and Dr Richard Marriott to the group, and extended the welcome to any other member of the WWSAG who wished to join. At the same time as welcoming new members we inevitably have to say goodbye to some; the group is very grateful to past input from a founder member, Prof Alison Hester (James Hutton Institute) and wish her well in her new role; and also to Hebe Carus, previously of the Mountaineering Council of Scotland and now working with RSPB on their Futurescapes project in the Cairngorms.