



## Contents

1. Introduction .....	2
2. Western Isles woodland history .....	4
3. Present native woodland cover .....	6
4. Tree species description with propagation techniques .....	8
5. Native woodland protection and expansion .....	26
6. Information sources .....	28
7. Bibliography .....	28
8. Glossary .....	30

## 1. Introduction

Native woodland is defined as a collection of tree species that occur naturally to an area without the intervention of man. These indigenous tree species can form semi natural woodland which represents the nearest habitat to truly natural woodland in Britain. At present native woodland in the Western Isles is extremely fragmented and it is predominantly restricted to areas inaccessible to grazing animals such as gullies, islands, crags and cliffs. This valuable source of biodiversity is at present reduced to approximately 50 - 70 hectares in total for the Western Isles.

As part of the UK Biodiversity Action Plan, the Western Isles Local Biodiversity Steering Group produced The Western Isles Local Biodiversity Plan (LBAP). This document covers a broad range of habitats specific to the Western Isles and includes a Native Woodland Habitat Action Plan (NWHAP), which was launched in May 2004. Through the actions identified the partners aim to protect native woodland species through: identification of key sites, protection of these sites through specific funding aimed at their protection and expansion through seed collection and propagation for new planting schemes. The purpose of this booklet is to provide the necessary information and advice for anyone interested in identifying, protecting, gathering and / or propagating seed from these valuable sources. This in turn should lead to the expansion of native woodland areas in the Western Isles.

## Clàr-Innse

1. Ro-ràdh .....	3
2. Eachdraidh Coilltean nan Eilean Siar .....	5
3. Suidheachadh Gnàthaichte Coilltean Dùthchasach .....	7
4. Mineachadh Gnè Chraobhan le Dòighean Siolaidh .....	9
5. Dìon agus Leudachadh air na Coilltean Dùthchasach .....	27
6. Tuilleadh leughaidh .....	29
7. Liosta Co-chomhairleachaidh .....	29
8. Clàr-mineachaidh .....	31

## 1. Ro-ràdh

Tha coille dùthchasach air a mhineachadh mar chruinneachadh de chraobhan a tha fàs gu nàdarach ann an àite gun duine a bhith air an cuir. Tha na craobhan dùthchasach a tha seo a' cruthachadh coille leth-ghnèitheach a tha a' comharrachadh an àrainn as fhaigse air coille gnèitheach is a gheibhear ann am Breatainn. An-dràsta tha coilltean dùthchasach as na h-Eileanan Siar gu math sgapte agus tha iad rin lorg ann an àitean far nach ruig beathaichean, leithid eileanan, creagan, sgoran agus carraigean. Tha an seòrsa bith-iomadachd prìseil a tha seo an dràsta air a lùghdachadh gu eadar 50 agus 70 heactair anns na h-Eileanan Siar. Mar phàirt dhe Phlana Gnìomh Bith-lomadachd Bhreatainn, tha Buidheann Stiùiridh Bith-lomadachd Ionadail nan Eilean Siar air Plana Bith-lomadachd Ionadail a' cruthachadh airson nan Eilean Siar (LBAP). Tha an aithisg a' dèanamh mineachadh air an difear

sheòrsa àrainn a tha ri lorg as na h-Eileanan Siar agus tha Plana Gnìomh Àrainneachd Coilltean Dùthchasach (NWHAP) na chois cuideachd air fhoillseachadh sa Chèitean 2004. Tro na gnìomhan air an sònrachadh, tha na buidhnean com-pàirt ag amas air gnèithean coilltean dùthchasach a dhion tro: prìomh làraich a shònrachadh, na làraich seo a dhion tro mhaoinachadh sònraichte a tha ag amas air an dìon agus an leudachadh tro cruinneachadh agus tarmachadh siol airson sgeamaichean planntachadh as ùr. 'S e amas na bileag seo an fhiosrachaidh agus a chomhairle freagarrach a thoirt seachad do dhuine sam bith aig a bheil ùidh ann a bhith ag aithneachadh, a' cruinneachadh, a' dìon agus a' tarmachadh siol bho na stòrasan prìseil a tha seo. Bu chòir gu leudaicheadh seo coilltean dùthchasach nan Eileanan Siar.



Downy birch, Mullach nan Ròn. Beithe Chaimheach, Mullach nan Ròn.



Juniper, Tolsta, Isle of Lewis  
Lubhar - Beinne, Tolastach, Eilean Leodhais



Allt Vòlgair, South Uist. Allt Bhòlgair Uibhist a Deas.



## 2. Western Isles woodland history

Forest cover in the Western Isles has been the subject of several academic papers, which have centred on the evidence or lack of evidence to confirm the existence of substantial woodland cover through the **Holocene** period. The majority of papers lead to the consensus that open woodland cover was indeed present in the early Holocene period from 9600 Before Present (BP) until the mid Holocene period 4500 BP when blanket peat expansion resulted in woodland decline (Fossitt, 1994). By 2500 BP woodland cover had become restricted to coastal areas in the form of woody scrub (Fossitt, 1994), which is still present today. Species present during the Holocene period based on **macrofossil** and pollen evidence as well as **palynological** evidence are:

- < Scots pine *Pinus sylvestris* L. 7200 – 3400 BP
- < Oak *Quercus*, Elm *Ulmus*, Common Alder *Alnus glutinosa* and Ash *Fraxinus excelsior*. 8000 – 4000 BP
- < Downy birch, Willow, Hazel, Juniper, Holly, Rowan, Aspen. 9600-present.



Reinigeadal Bay, Isle of Harris. Bagh Reinigeadal, Na Hearadh.

Woodland cover was at its maximum from 9000-8000 BP before blanket peat in Western Lewis resulted in woodland cover being restricted to eastern Lewis and southward through Harris and the Southern Isles. The maximum woodland diversity in terms of woodland species came between 5000-6000BP until the second period of decline due to blanket peat expansion from 5200 BP onwards (Fossitt, 1994). Further woodland decline can be attributed to the presence of man from 3900 BP onwards, which would have resulted in loss of woodland for construction, grazing and crop production.



Grey Willow, Mallaig. Seileach Glas, Maraig

## 2. Eachdraidh Coilltean nan Eilean Siar

Chaidh grunn phàipearan acadaimigeach a sgrìobhadh mu choilltean nan Eilean Siar, a tha air a bhith stèidhichte air an fhianais no cion fianais a dhearbhadh gu robh farsaingeachd de choille ann tro linn **Holocene**. Tha a mhòr chuid dhe na pàipearan a' co-dhùnadh gu robh còmhach coille fhosgailte ri fhaicinn aig toiseach linn Holocene bho 9600 ron Latha an Diugh (BP) gu meadhan an Linn Holocene 4500 BP nuair a ghabh mòinteach làmh an uachdar air na coilltean (Fossitt 1994). Mu 2500 BP is ann a mhàin air an oirthir a bha coille ri fhaighinn ann an cruth rasanach (Fossitt, 1994), agus tha seo fhathast ri fhaicinn an diugh. Stèidhichte

air **Macrofossil** agus fianais poilean, a bharrachd air fianais **palynological**, se na gnèithean chraoibh a bha rim fhaighinn aig àm an linn Halocene:

- < Giuthas Albannach *Pinus sylvestris* L. 7200-3400BP
- < Darach *Quercus*, Leamhan *Ulmus* Feàrna *Alnus Glutinosa* agus Uinnseann *Fraxinus excelsior*. 8000-4000 BP
- < Beithe Chlòimheach, Seileach, Calltann, lubhar-beinne, Cuileann, Caorann, Critheann. 9600-An diugh

Bha coille aig an ìre as làidire eadar 9000-8000 BP mus do ghabh talamh mòinteach làmh an uachdar air taobh siar Leòdhais a' fàgail coille air a chuingealachadh ri tabh sear Leòdhas, deas tro na Hearadh agus sios tro na Eileanan a Deas. 'S ann eadar 5000-6000 BP a bha an àireamh as motha

de dhifear ghnè craobh ri lorg chun dara tràth de chionnadh ri lost leudachadh air mòinteach bho 5200 BP chun latha an diugh.

Tha tuilleadh crìonadh an urra ri mac-an-duine a bhith tuineachadh anns na h-Eileanan bho 3900 BP, a chiallaich gu robh coilltean air an call air sgàth craobhan a bhith air an leagail airson togalaichean, ionaltradh, agus obair àiteachaidh.

Hazel and dog roses clinging to rock face at Kneep, Uig. Calltann agus ros-nan-coin air aghaidh chieag aig Crip, Uig.



Highland cattle, Paicr. Gòdh Ghàhèlach Paicr.



### 3. Present Native Woodland cover

As previously mentioned, native woodland cover in the Western Isles is now restricted to areas that are protected from grazing. A comprehensive survey of the Islands has not yet been completed. The distribution of tree cover (as known at November 2005) is indicated on Figure 1.

Woodland habitats in the UK have been given National Vegetation Classifications (NVC's) dependent on their species composition. NVC habitats native to the Western Isles include: W1 *Salix cinerea* – *Galium palustre* woodland; W4 *Betula pubescens* – *Molinia caerulea* woodland; W11 *Quercus petraea* – *Betula pubescens* – *Oxalis acetosella* woodland; W17 *Quercus petraea* – *Betula pubescens* – *Dicranum majus* woodland. However, woodland habitats are rarely composed of all the necessary tree species to meet these classifications fully and most woodland habitats consist of a mixture of the following:

- < Aspen *Populus tremula* L.
- < Creeping Willow *Salix repens* L.
- < Downy or White Birch *Betula pubescens* Ehrh.
- < Eared Willow *Salix aurita* L.
- < Goat Willow *Salix caprea* L.
- < Grey Willow *Salix cinerea* L.
- < Grey Sallow Willow *Salix*



- cinerea* L. ssp. *Cinerea*
  - < Hazel *Corylus avellana* L.
  - < Holly *Ilex aquifolium* L.
  - < Juniper *Juniperus communis* L.
  - < Rowan or Mountain Ash *Sorbus aucuparia* L.
- Much of the surviving woodland cover is represented by two or three trees in close proximity, or stands of Aspen (Figure 2) that spread via root suckers but are essentially one single

organism. These small isolated trees or groups of trees are perhaps the most valuable sources of genetic material available in the Western Isles and should be protected when possible.

### 3. Suidheachadh Ghnàthaichte Coille Gnèitheach

Mura chaidh mineachadh nas tràithe tha coille gnèitheach anns na h-Eileanan an Iar a-nis air cuingealachadh gu àiteachan a tha air an dìon bho ionaltradh. Chan eil sgrùdadh mionaideach air na h-eileanan a choilionadh gu ruige seo. Tha Dealbh 1 a nochdadh na h-àiteachan sin far a bheil coille (mar a bha clàraichte san t-Samhain 2005) Tha àrainn choilltean ann am Breatainn air Seòrsachadh Fàs-mhorachd Nàiseanta (NVC's), an urra ris an seòrsa gnè aca, fhaighinn. Seo cuid de na h-àrainnean NVC a tha rin lorg anns na h-Eileanan Siar; W1 coille *Salix cinerea* – *Galium palustre*, W4 coille *Betula pubescens* – *Oxalis acetosella*, W17 coille *Quercus petraea* – *Betula pubescens* – *Oxalis acetosella*, W17 coille *Quercus petraea* – *Betula pubescens* – *Dicranum majus*.

A dh'aindeoin sin, is ann ainneamh a bhios gach gnè craobh iomchaidh an làthair ann an àrainneachd choille gu coinneachadh gu tur ris an seòrsachadh sin agus tha a mhòr-chuid de dh'àrainn choille a' toirt a-steach measgachadh de na leanas:

- < Critheann *Populus tremula* L.
- < Seileach 'Creeping' *Salix repens* L.
- < Beithe Clòimheach neo Beithe Geal *Betula pubescens* Ehrh.
- < Seileach cluasach *Salix aurita* L.
- < Seileach *Salix nan Gobhar Caprea* L.
- < Seileach Geal *Salix Cinerea* L.
- < Seileach Liath *Salix Cinerea* L ssp *Cinerea*
- < Calltainn *Corylus avellana* L.
- < Cuileann *Ilex aquifolium* L.
- < Aiteann *Juniperus communis* L.
- < Caorann neo uinnsean-beinne *Sorbus aucuparia* L.

Tha mòran de den choille a mhair air a riochdachadh le dà chraobh no trì faisg air a chèile, no piosan de Chrithheann (Dealbh 2) a bha sgaoileadh tro na freumhaichean ach gu bunaiteach se aon fàs-bheairt. Tha na craobhan no na buidhnean chraobhan seo air stòras cho luachmhor's tha againn air stuth ginteach anns na h-eileanan an Iar agus bu chòir an dìon far a gabh sin dèanamh.



Downy birch regeneration, Allt Voligair Ath-bheòthachadh Beithe Clòimheach, Allt Bhlhoagair



Aspen, Kneep, Uig. Critheann, Cnrip, Uig.



Figure 2 Dealbh 2

## 4. Tree species description with propagation techniques

Identification of tree species and their associated habitats is an essential starting point for native woodland restoration. The following chapter will help users identify key tree species and site suitability criteria for woodland regeneration, including identification of suitable soil types for good tree growth and proven propagation techniques.

### > Aspen *Populus tremula* L.

> **Origin & Range:** Native to the British Isles but can be found in a range that reaches across temperate Europe through Asia to China and Japan and also from the Mediterranean north to the Arctic Circle. In the UK Aspen is most commonly found in Northern and Western Scotland.

> **Habitat:** Aspen is tolerant of a wide range of soil types including both peaty and sandy soils and can reach 20m in height. However, in the Western Isles Aspen is most likely to be found as a **chasmophyte** reaching 5-10m in height.

> **Bark:** Smooth and grey getting progressively darker and fissured towards the base of the trunk. Shoots are



usually **glabrous** and dull grey in colour with prominent leaf scars making twigs look gnarled in appearance.

> **Leaves & Buds:** Buds are **ovate** and **acute** in shape but can vary in size dependent on whether they are either sterile or fertile. Sterile buds are small and are approximately 5mm in length, whereas fertile buds containing catkins can be 10mm long, both are chestnut brown in colour. Leaves are broadly ovate with short **acuminate** and irregular teeth on leaf margin and measure 4-6 x 5-7cm in size.

> **Fruit & Flowers:** Aspen is a **dioecious** species so therefore the male and female catkins are produced on separate plants in early spring before the leaves emerge. When the catkins appear in late March/

early April the male flowers are yellow in colour as they shed their pollen. The female catkins are green to start with, becoming woolly and white in mid May due to seed production. However, seed production in Scotland is very rare, the cause of which is not yet fully understood.

> **Propagation:** As Aspen rarely produce seed in Scotland, vegetative methods of propagation are used to produce clone plants. The charitable organisation *Trees for Life* have been at the forefront of native woodland restoration in the Highlands of Scotland and have published several papers on propagation of various species including Aspen. As part of



Collecting root cuttings at Glen Affric, as part of the Trees for Life Aspen propagation course. A cummeachadh framhghhearrachd aig glenn affric, mar phàirt de chùrsa sìolaidh Critheann fo Chraobhan a'ona Beatha.



Aspen seedlings after 1 year's growth. Sìoladh Critheann an dèidh bliadhna de dh'fhàs.

## 4. Mineachadh Gnè Chraobhan agus Dòighean Siolaidh

Tha e deatamach gnè chraobhan agus an àrainn a shònrachadh mus tèid tòiseachadh air ath-shuidheachadh coille gnèitheach. Bidh an caibideil a leanas feumail do luchd-cleachdaidh ann a bhith ag aithneachadh dìfear seòrsa craobh agus dè na n-àitean a bhithheadh freagarrach airson ath-shuidheachadh coille, a toirt aire dha seòrsa talamh freagarrach airson fàs agus dòighean siolaidh dearbhte.

### > Critheann *Populus tremula* L.

> **Tùs agus Raon:** Gheibhear i seo ann am Breatainn ach cuideachd anns na pàirtean as blàithe den Roinn Eòrpa, tro Àisia gu Sìona agus Iapan, cuideachd pàirtean de na meadhan-thìrean tuath gu Cearcall an Artaig. Ann am Breatainn 's ann air taobh tuath agus taobh siar na h-Alba as cumanta a tha an critheann.

> **Àrainn:** Fàsaidh critheann ann an iomadach seòrsa talamh, an da chuid talamh

mòinteach agus talamh gainmheil agus fàsaidh i suas gu fichead meatair a dh'àrd. Ach, anns na h-Eilean an Iar, 's ann mar chasmophyte, eadar 5-10 meatair, as trice a chithear i.

> **Rùsg:** Còmharnad agus liath agus a' fàs nas duirche agus sgorach faisg air bonn a chrann. Tha na failleanan mar as trice lom agus dorch liath le làraich dhuilleach faicsinneach a' fàgail gu bheil na meanglanan a coimhead cràiceach.

### > Duilleagan agus Gucan:

Tha coltas uighe biorach air na gucan ach caochlaideach ann am meud a-rèir a bheil iad torrach no neo-thorrach. Tha na gucan neo-thorrach timcheall air 5mm a dh'fhaid, an coimeas ri gucan torrach le caitein a bhios suas ri 10mm a dh'fhaid, le chèile donn-dearg nan dath. Tha cumadh uighe air na duilleagan a ruighinn gob biorach le oir dhuilleach ribeagach agus 4-6 x 5-7cm ann am meud.

> **Measan agus Dithean:** Tha gnè fireann agus boireann air critheann agus mar sin tha caitein fireann agus boireann air an cruthachadh

air plantrais fa leth tràth as an earrach mus nochd na duilleagan. Nuair a nochdas na caitean aig deireadh a' Mhàrt neo toiseach a' Ghiblean tha na dithean fireann buidhe fhad 's a tha am poilean a tuiteam dhiubh. Tha na caitein boireann uaine an toiseach ach fàsaidh iad geal agus clòimheach meadhan a' Chèitein nuair a tha sìoladh a' gabhail àite. Is ann tearc a tha sìoladh a' gabhail àite ann an Alba, ged nach eil tuigse fhathast air carson a tha seo.

> **Sìoladh:** Air sgàth is gur ann ainneamh a tha sìoladh chritheann a tachairt ann an Alba, tha dòighean fàs-mhor air sìoladh dhan cleachdadh airson plantrais a' chruthachadh. Tha am buidheann carthannais *Trees for Life* air a bhith aig toiseach obair ath-shuidheachaidh choilltean gnèitheil Gàidhealtachd na h-Alba agus dh'fhoillsich am buidheann grunnan phàipearan air dòighean sìolaidh iomadh chraobh, an critheann nam measg. Mar phàirt de phròiseact air an critheann, tha *Trees for Life* air an dòigh a leanas a' leasachadh airson Critheann a sìoladh:

1. Cruinnich gearraidhean de na freumhan bho phlantrais a tha air a thighinn gu ìre, eadar an Gearran agus a' Chèitein ma ghabhas sin a bhith. Bu chòir na gearraidhean a bhith mu 30cm a dh'fhaid agus 1-3 tarsaing. Gheibhear lorg air na freumhan faisg air na failleanan neo chithear iad am follais a' ruith thairis air creagan.

2. Aon uair is gu bheil na piosan freumh air an cruinneachadh,



Aspen buds. Gucan Critheann.



their Aspen project, *Trees for Life* have developed the following technique for Aspen propagation:

#### 1. Collect root cuttings

from mature adult plants using secateurs whilst the tree is dormant, ideally between February and May. Root cuttings should be approximately 30cm in length and 1-3cm in diameter. Roots can be found near suckers or can be seen exposed running over rocks.

2. Once the root sections have been collected seal them in plastic bags lined with damp moss, labelling each root section with the OS grid reference, date and site name. Moderate root collection will stimulate sucker production and therefore will help improve the stand's viability.

3. Sites that have been used for collection of root material should then be listed and left for a period of at least five years before any subsequent cuttings are taken. All sites should be left in an undisturbed state with any soil, vegetation replaced.

4. Roots should be stored in plastic bags or in boxes containing brown soil and leaf litter or moss so the cuttings do not dry out before planting.

5. Planting out can be performed using old fruit boxes (wooden), allowing



Figure 3. Dealbh 3.

for around 10x30cm root sections per box. Firstly fill the boxes with brown earth/leaf litter mix then lay the root cuttings out as shown in Figure 3. Cover them with approximately 5cm of leaf litter/brown earth. The trays should then be kept moist and out of cold weather, preferably in a polytunnel.

6. After a period of 4-12 weeks aspen shoots should start to emerge from the growth medium. Once these shoots reach 5-7cm in height cut them as near to the parent root as possible. Once the cuttings have been collected make sure they are kept out of direct sunlight to prevent wilting damage.

7. Prune lower leaves and dip the cuttings into a rooting compound that contains an antifungal element such as 'Strike'. Plant on the cuttings into a moisture retaining compost medium, preferably containing perlite. Perlite will improve the compost's moisture retention

characteristics as well as increasing its air porosity.

8. Cuttings now need to be kept moist as they have no roots to draw in water or nutrients. This is best performed using a misting unit in a polytunnel with an electric leaf sensor controlling the moisture levels.

9. Roots should appear within two to three weeks, after which the plants should be removed from the misting unit and moved into a cold frame to slowly harden them off. Again the young clones should start producing a more compact root system by week three and can then be potted on.

In general, trees produced in this manner should be ready for planting by the autumn. However in the Western Isles the weather can be extreme at this time of year and it would be advisable to wait until late February before planting outside.

dùin iad ann am pocan plastaig le beagan còinneach air am bonn, sgrìobh comharra OS, ceann-latha agus ainm an làraich air gach pìos. Le bhith cruinneachadh pìosan freumh thig tuilleadh fàs air na failleanan agus thig piseach air buanas nan craoibh.

3. Bu chòir na làraich far an deach stuth freumhach a thional a bhith air an liostadh agus air am fàgail co dhìu còig bliadhna mus tèid an gearradh tuilleadh. Bu chòir gach làrach a bhith air am fàgail mar a chaidh am faighinn, le talamh, plantraisean air an cuir air ais mar a bha iad.



Aspen, Tolsta. Criteam Tolstradh.



Aspen cuttings. Gearraidhean Chrithheam.

4. Bu chòir do na freumhan a bhith air an cumail ann am pocanan plastaig no ann am bucais far a bheil talamh donn agus seann dhuilleagan no còinneach gus nach tiorraich na gearraidhean mus tèid an cuir.

5. Faodar an cuir a-muigh ann an seann bucais mheasan, (fiodha) le 10 pìos freumh 30cm anns gach bucais. An toiseach lion na bucais le measgachadh de thalamh agus seann dhuilleagan agus sin na bun fhreumhan mar a thàir a shealltainn aig Dealbh 3. Còmhdaich na freumhan le timcheall air 5cm den talamh mheasgaichte. Bu chòir gu leòr bùrn a chumail air na bucais agus an cumail a-mach as an fhuachd,

6. An dèidh 4-12 seachdainean bu chòir failleanan critheann a bhith a' nochdadh tron talamh. Nuair a ruigeas na failleanan a tha seo eadar 5-7cm gearraibh iad cho faisg air am freumh sa ghabhas. Aon uair is gu bheil na gearraidhean air an cruinneachadh bu chòir an cumail air falbh bho sholas na grèine mus tòisich iad a' seacadh.

7. Lomaibh na duilleagan isosal agus tomaibh na gearraidhean ann an cungaidh fhreumhaidh anns a bheil eileamaid ana-fungail mar "Strike". Cuiribh na gearraidhean ann an aolach a ghlèidheas uisge, le perlite na mheasg ma tha sin idir comasach. Tha perlite a leasachadh comas an aolach uisge a ghlèidheadh nas fhaide agus cuideachd a meudachadh àile a bhios ann.

8. Feumar na gearraidhean a-nis a chumail fliuch air sgàth 's nach eil freumhan orra a ghabhas a-steach uisge no mathachas. Obraichidh seo nas fheàrr ann an polytunnel le inneal frasaich agus le inneal mothachaidh air na duilleagan a cumail smachd air irean fliuchaidh

9. Bu chòir gu nochdadh freumhan an dèidh dhà no trì sheachdainean, an uair sin bu chòir am plantrais a toirt as an inneal frasaich agus an cuir ann am frèama fuar gus an neartachadh. As dèidh trì seachdainean bu chòir gum bitheadh siostam de fhreumhan a-nis stèidhichte agus faodar a-nis an cuir ann am poitean eile.

Anns a choisicheann, bu chòir gum biodh craobhan a th'air an àrach anns an dòigh seo deiseal airson an cuir anns an Fhoghar. Anns na h-Eileanan an Iar, ged tha, faodaidh fìor dhroch aimsir a bhith ann an uairsin agus bhiodh e nas cothromaich fuireach gu anmoch sa Ghearran mus tèid càil a chur a muigh.

> **Downy or White Birch**  
*Betula pubescens* Ehrh.

Downy birch is an extremely hardy pioneer tree species closely related to Silver birch, and thrives in acidic soils and cooler wetter climates present in North West Scotland. The species is extremely useful as a soil improvement/nursery species and can produce as much as 3-4 tonnes of leaf litter per hectare per annum, which greatly improves the soils nutrient status (Featherstone, 2004). In the Western Isles Downy birch forms the only real NVC habitat (W4) cover as seen in Figure 4, and is the primary species for woodland habitat restoration.

> **Origin & Range:** Native across Europe and North Asia, reaching the northern limits of tree growth (Savill, 1991), particularly common in Scottish Highlands.

> **Habitat:** Downy birch is a deep rooted species that can tolerate poorly drained heathland including waterlogged peats. The species can also tolerate high levels of exposure and survive at high altitudes (250m in the Western Isles), although the tree usually reverts to a bush like form in highly exposed areas.

> **Bark:** Characteristic silver colour with horizontal grey/brown banding when mature. Juvenile stems are red/brown

in colour becoming smooth and paler with age.

> **Leaves & Buds:** Leaves are evenly toothed, oval /diamond shaped, are approximately 3cm long and are bright green in colour. Buds are reddish purple and are arranged alternately along twigs. Petiole is pubescent in appearance, reaching 2cm in length.

> **Flowers & Fruit:** Flowering commences in March before the leaves have fully flushed and continues until the end of April. Downy birch is monoecious, meaning both male and female catkins are present on each tree. Male catkins start to develop over winter and appear in April as 5cm red/brown dangling

bodies. Female catkins flush with the leaves and are erect, green in colour, scaled and 2-3cm in size. Post fertilisation, the female fruiting bodies swell in size to form cone shape structures consisting of tiny winged fruit. The time of seed release can start from early September, and is usually subject to climatic conditions. Therefore it is best to collect seed as soon as possible to avoid the autumn gales stripping the seed before collection.

> **Propagation:** Collect seed in September and stratify by refrigerating for two to three months at 5°C and then plant out into a flat firm seed bed in March/early April. Seed should only be thinly covered with a leaf mulch/fine grit substrate.



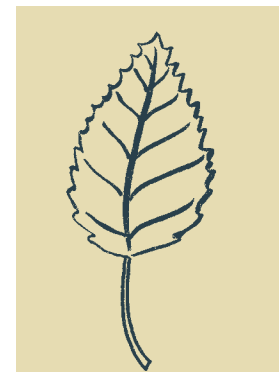
Figure 4. Dealbh 4. Downy birch regeneration, South Lochs, Isle of Lewis. Am bheòthachadh, beithe chloimheach, ceann a deas nan loch, Eilean Leòdhais.

> **Beithe Chloimheach**  
neo **Beithe Gheal** *Betula pubescens* Ehrh.

'S e gnè chraoibh air leth làidir a th'anns a bheithe chloimheach le dlùth cheangal ris a bheithe dhubhach (d3) a tha tighinn beò ann an talamh searbhach agus ann an àile fliuch, fuar mar a gheibhear ann an Iar Thuath na h-Alba.

Tha an seòrsa craobh seo gu math gu bhith a' toirt air adhart leasachadh talmhainn/àrachadh chraobhan agus gach bliadhna tha e a' cruthachadh eadar 3-4 tunna de dhuilleach gach heactair, a tha toirt buaidh mhòr air inbhe mathachaidh na talmhainn (Featherstone, 2004). Anns na h-Eileanan an Iar is i a bheithe chloimheach [d4] an aon fìor àrainn NVC (W4) mar a chithear ann an Dealbh 4 agus 's i am prìomh sheòrsa de chraoibh airson ar coilltean dùthchasach ath-bheòthachadh.

Tùs agus Raon – Gu nàdarra air feadh na Roinn Eòrpa agus Àisia a Tuath, a' ruighinn cho fada tuath sa dh'fhàsas càil idir (Savill, 1991) gu sònraichte cumanta air a' Ghàidhealtachd.



> **Àrainn:** Tha freumhan gu math domhainn air a bheithe chloimheach agus giùlainidh i talamh fraoich gu math fliuch agus mòiteach bhog. Tha i seasmhach cuideachd ann an àrainnean fosgailte agus air talamh àrd (250m as na h-Eileanan Siar), ged glè thrì thig cumadh preas air craobh aig an àirde sin.

> **Rùsg:** Dath airgead le cearcallan glas/donn nuair a thig a chraobh gu aois. Tha casan chraobhan nas òige ruadh/donn ann an dath ach fàsaidh iad na soilleire agus còmhndard le aois.

> **Duilleagan agus Gucan:** Tha bidean còmhndard air na duilleagan, ann an cruth leth-chruinn/daoimean, mu 30cm a dh'fhaid agus soilleir uaine nan dath. Tha na gucan purpaidh dearg agus tha iad eadar na duilleagan air gach geug. Tha cas na duilleig molach a ruighinn suas ri 2cm a dh'fhaid.

> **Measan agus Dithean:** Thig blàth air na duilleagan sa Mhàrt mus eil iad buileach fosgailte agus leanaidh seo gu deireadh a Ghiblean. Tha beithe chloimheach aon-ghnèitheach tha seo a' ciallachadh gu bheil caitean fireann agus boireann air gach craobh. Tha caitean fireann a' tighinn gu ìre tro mhiosan a' Gheamhraidh agus chithear iad anns a Ghiblean agus chithear iad a slaodadh mar chruinneachadh dearg ruadh suas ri 5cm a dh'fhaid. Tha na caitean boireann a fosgladh còmhla ris na duilleagan agus tha iad dìreach, uaine le lannan agus timcheall air 2-3cm ann am meud. An dèidh torrachaidh, tha na cuirp

bhoireann a dol am meud gu bheil iad ann an cruth còrn le mion-mheasan sgiathach. Tha an siol dha sgaoleadh cho tràth ris an t-Sultain, a-rèir an aimsir. Mar sin bu chòir an siol a chruinneachadh cho luath sa ghabhas mus falbh a' ghaoth leis.

> **Sioladh:** Cruinnichibh an siol anns an t-Sultain agus cuiribh iad ann an gainmheach fhliuch agus cumaibh iad fuar ann an reothadair airson dha neo trì mhiosan aig 5°C agus faodar an cur a-muigh eadar deireadh na Màrt agus toiseach a Giblean. Bu chòir còmhndach tana de sheann dhuilleagan/clachan beaga a bhith a' chuir air a mhullach.

> **Gnèith Salix**

'S iad seileach cluasach, seileach liath agus seileach nan gobhar a tha gu nàdarra rim faighinn anns na h-Eileanan an Iar. Tha seileach nan gobhar (d5) gu math furasta aithneachadh oir chan eil mòran atharrachadh a' tighinn air. Ach, mar an seòrsa seileach air ainmeachadh os cionn tha e a tar-thorachadh le Seileach Liath agus tha seo a' dèanamh cùisean nas duilghe airson an aithneachadh. A-thaobh cunntas nan seòrsa craobh chan eil iomradh ga thoirt air an fheadhainn measgachte or chan eil sin comasach aig an ìre seo. Airson tuilleadh fiosrachaidh mu dheidhinn sònrachadh dìfear sheòrsa seileach tha an leabhar 'Willows and Poplars of Great Britain and Ireland' (Meikle R.D Leabhar BSBI, Àireamh 4, 1984) na iùil fìor mhath air an Teaghlach Salicaceae.



## > Salix Species

Willows native to the Western Isles consist of three main species: **Eared**, **Grey**, and **Goat**. Identification of goat Willow remains relatively simple as it is not a species prone to great variability. However, like all the above Willow species it hybridises readily with Grey Willow which can lead to difficulty in identification. For the description of each species hybrids have not been discussed as this is not possible at present. For an in depth guide to Willow identification 'Willows and Poplars of Great Britain and Ireland' (Meikle R.D, BSBI Handbook No 4, 1984) provides an excellent guide to the Salicaceae Family.

### Eared Willow *Salix aurita* L.

> **Origin & Range:** Widely distributed throughout Central and Northern Europe, in the UK it is most prominent in barren parts of Scotland, Ireland and Wales. Eared Willow grows to approximately 2.5m in height on typical acidic heath sites.

> **Habitat:** Mainly found on acidic heaths, moors and on marginal agricultural land. Can be present to altitudes of 800m, withstands frost and high levels of exposure. Eared Willow can also grow in very basic acidic soils.

> **Bark:** Brown and red when young turning grey with age.



> **Leaves & Buds:** Buds are red/chestnut brown in colour and are glabrous. Leaves are a dull green on the upper side and pale grey on the underside and generally **pubescent**. Leaf shape is **obovate**, base **cuneate**, margins **undulate-serrate** with irregular teeth. **Stipules** at the base of the **petiole** are ear shaped and prominent and give the species its name.

> **Fruit & Flowers:** Catkins appear ahead of the plants leaves in April and early May. Male catkins are 1 -2cm in length and are yellow, female catkins are larger and downy in appearance due to the seeds present. Eared Willow is dioecious and has male and female catkins on separate plants.

### Goat Willow, Sallow Willow *Salix caprea* L.

> **Origin & Range:** Present throughout Europe to N.E. Asia, Goat Willow is larger than both Grey and Eared Willow reaching up to 10m in height. The species got its name from grazing habits of goats who



Ancient Goat Willow. Seann chraobh Seileach nan Gobhar



can reach its young shoots and leaves which are palatable to livestock.

> **Habitat:** Common throughout Britain, Goat Willow can be found on a wide range of sites including: damp woodlands, hedgerows, woodland margins, scree slopes and rock faces. The species does have a slight preference for **calcareous** soils common in the lowlands of Britain but cannot be described as a **calcicole**.

> **Bark:** The bark is pale grey and smooth, turning gradually more fissured towards the **bole**.

### Seileach Cluasach *Salix aurita* L.

> **Tùs agus Raon:** Air an sgaoileadh fad is farsaing tro meadhan agus an taobh tuath na Roinn Eòrpa, ann am Breatainn tha iad gu math cumanta ann am fàsaichean Alba, Èirinn agus a' Chuimrigh. Tha Seileach Cluasach a' fàs gu mu 2.5 a dh'àrd agus tha e ri fhaighinn air monaidhean far a bheil an talamh searbhach.

> **Àrainn:** Ri fhaicinn air monaidhean searbhach, mòintich agus air talamh beag àitichte. Chìthear e ann an àitean cho àrd ri 800m agus seasaidh e ann an reòthadh trom air talamh fosgailte. Fàsaidh Seileach Cluasach cuideachd ann an talamh a tha gu math searbhach.

> **Rùsg:** Donn agus dearg nuair a tha a chraobh òg agus a fàs liath nuair a tha i a' tighinn gu ìre.

> **Duilleagan agus Gucan:** Tha na gucan dearg/donn ann an dath agus chan eil clòimh sam bith ri fhaicinn orra. Tha dath doilleir uaine air aon taobh de na duilleagan agus tha iad soilleir liath agus molach air an taobh eile. Tha cumadh mar ugh air na duilleagan, leathainn aig a bhonn le oirean biorach neo-dhìreach. Tha na stiopail air cas na duilleig ann an cumadh cluais agus sann às an seo a thàinig an t-ainm.

> **Measan agus Dithean:** Tha caitean a' tighinn air a' phlantrais mus tig na duilleagan anns a' Ghiblean agus toiseach a' Chèitean. Tha na caitean fireann mu 1-2cm

a dh'fhaid agus buidhe, agus tha na feadhainn boireann as motha agus molach seach gu bheil siol annta. Tha an Seileach Clòimheach dà-ghnèitheach agus tha caitean fireann agus boireann air plantrais eadar dhealaichte.

### Seileach nan Gobhar, Seileach Gheal *Salix caprea* L.

> **Tùs agus Raon:** Ri fhaicinn tron Roinn Eòrpa gu Iar Dheas Àisia, tha seileach nan gobhar nas motha nan seileach geal agus an seileach cluasach agus ruigidh iad suas gu 10m de dh'àrd. Fhuair e an t-ainm bho mhodh ionaltraidh gobhair oir gheibh iadsan grèim air na duilleagan agus failleanan òg a tha cho blasta do bheathaichean.

> **Àrainn:** Cumanta air feadh Bhreatainn, gheibhear seileach nan gobhar ann an iomadh seòrsa àite leithid: coilltean fliuch, callaidean, iomall choilltean, bruthaichean sgàirneach agus air aodainn chreagan. Fàsaidh an craobh seo math dha ìreabh ann an talamh cailceach, cumanta ann a Ceann a Deas Bhreatainn ach cha chanar craobh cailceach rithe.

> **Rùsg:** Tha an rùsg soilleir liath agus còmhndard agus a' fàs nas sgàinte faisg air crann na craobhe.

> **Duilleagan agus Gucan:** Tha e gu math furasta an seòrsa craobh seo aithneachadh or tha na duilleagan coltach ri feadhainn craobh ubhal. Tha na duilleagan leth-chruinn, an seòrsa cumadh a th'air ugh le gob goirid biorach, am bonn

cruinn agus loidhnichean nan duilleag air chumadh chreachain. Tha na duilleagan eadar 5-12cm a dh'fhaid agus 2.5-8cm farsaing le dath doilleir uaine air aon taobh agus liath agus clòimheach air an taobh eile. Tha na gucan leth-chruinn agus eadar 8-10 a dh'fhaid, a' call an clòimh agus a' tionndadh donna mus tig na dithean orra. Tha casan na craobhe goirid (1cm) agus dorcha dearg nan dath.

> **Measan agus Dithean:** Tha caitean boireann a' tighinn air a' chraobh aig deireadh na Màrt/toiseach a' Ghiblean mus tig na duilleagan, mar is tric còmhla aig ceann a-muigh nan geug. Tha na caitean fireann uaine agus òr nan dath agus mu 3cm a dh'fhaid. Tha na caitean boireann mu 5-6 a dh'fhaid agus soilleir uaine an toiseach ach a' tionndadh donn agus molach nuair a tha an siol a' tighinn gu ìre gus a bheil an siol cotannach geal air an sgaoileadh aig deireadh a' Chèitein.

### Seileach Geal *Salix cinerea* L.

> **Tùs agus Raon:** Tha an Seileach Geal ri fhaighinn anns na h-aon àitean ri Seileach nan Gobhar. Fàsaidh am preas seo suas gu 10m ach anns a chumantas's ann timcheall air 2-3m a bhitheas iad.

> **Àrainn:** A-rithist cumanta air feadh Bhreatainn, ach is fheàrr leis an Seileach Geal coilltean fliuch, Càrr, bruachain aibhnichean, talamh searbhach mar monaidhean fliuch agus talamh mòine làn mathachas.



> **Leaves & Buds:** Highly recognisable due to the Apple tree-like appearance of the foliage, Goat Willow leaves are oval, obovate or lanceolate with a obliquely short pointed tip and a rounded base, with the leaf margins shallowly crenate. Leaves are between 5-12cm long and 2.5-8cm wide and are dull green above and grey and pubescent below. Buds are bluntly ovoid 8-10mm in length, turning glabrous and glossy chestnut brown before flowering. Petiole is short (1cm) and dark red in colour.

> **Fruit & Flowers:** Male and female catkins appear in March/early April before leaves emerge and are usually grouped at the end of twigs. Male catkins are green and gold in colour and around 3cm in length. Female catkins are 5-6cm in length and are pale green to begin with, turning fibrous and brown as seeds develop until the white cotton like seeds are dispersed by the end of May.

### Grey Willow *Salix cinerea* L.

**Origin & Range:** Grey Willow has the same distribution as Goat Willow. The shrub can reach 10m in height but is more likely to be found in a shrub form 2-3m in height.

> **Habitat:** Again common throughout Britain. However, Grey Willow prefers damp woodlands, Carr, riparian areas, acidic soils such as wet

heaths and nutrient rich peats.

> **Bark:** dark grey/brown becoming gradually more fissured with age. Twigs are generally red/brown and pubescent up to approximately one year's growth.

> **Leaves & Buds:** Grey Willow leaves are usually 2-9cm long and 1-3cm wide, dull grey green/dark green above and ashy grey below. Underneath, the leaves are pubescent like other willows but unlike other species have distinctive rusty red pubescent hairs. Leaf shape can be varied and can be a combination of oblong, elliptic, obovate and oblanceolate. Leaf tip is usually acute or shortly acuminate, leaf base is cuneate, and leaf margins can be irregularly undulate-serrate.

> **Fruits & Flowers:** As with Eared and Sallow, Grey Willow flowers from March to April before the plant's leaves appear. Male catkins are erect, green and yellow and approximately 2-3cm in length. Female catkins are slightly smaller (1-2cm) and produce white woolly seeds in May, before which they are flask shaped and green/grey in colour.

> **Propagation:** All the three species described are dioecious and therefore require pollination by bees. Once pollination has taken



place, (seeds on the female plant) it takes between 3-5 weeks for the seed to mature after which they are dispersed via the wind. It is at this point that seed should be collected from May onwards and should be sown as soon as possible, due to the seeds short viability. Seed should be sown onto a moist, acidic peat based soil medium.

Mature wood cuttings can also be taken from all three Willow species from November through to February. The cuttings should be taken from wood of the current year's growth and planted in a sheltered outdoor bed or in their permanent position, as long as there is at least 50cm vegetation clearance around each cutting. Vegetation clearance is best performed using mulching materials or herbicides, but can also be carried out manually.

> **Rùsg:** Dorch ghlas/dhonn agus a' fàs nas sgàinte mar as sine a dh'fhàsas e. Tha na geugan mar is trice dearg/donn agus molach gus an ruig iad aon bliadhna a dh'aois.

> **Duilleagan agus Gucan:** Tha duilleagan Seileach Geal mar is trice eadar 2-9cm a dh'fhaid agus 1-3cm farsaing, 's doilleir uaine glas/dorcha uaine air uachdar agus glas gu h-ìosal. Air a bhonn, tha na duilleagan molach mar seileach eile ach eu-coltach ri feadhainn eile is ann dorch dhearg a tha na fionnadh. Tha cumaidhean eadar-dhealaichte air na duilleagan, measgachadh de na leanas: leth-chruinn, cruinn, air cumadh ugh, air chumadh lann. Tha gob na duilleig mar is trice biorach, a tighinn biorach, gun bhriseadh agus tha loidhnichean na duilleig glè thric neo-riaghailteach.

### > Measan agus Dithean:

Mar an Seileach Cluasach tha dithean air an Seileach Geal bhon Mhàrt chun Ghiblean. Tha caitein fireann dìreach, uaine agus buidhe agus timcheall air 2-3cm a dh'fhaid. Tha na caitean boireann nas lugha (1-2cm) and tha siol geal clòimheach a' tighinn orra anns a' Chèitein, ach roimhe sin bidh iad air chumadh searrag agus uaine/glas ann an dath.

> **Sioladh:** Tha na trì sheòrsa chraoibh a chaidh ainmeachadh dà-ghnèitheach agus mar sin tha feum aca air seillein airson an obair poileanaidh a' dhèanamh. Aon uair is gu bheil am poileanadh deiseal (siol air am plantrais bhoireann) tha e a' toirt eadar 3-5 seachdainean mus tig an siol gu ìre agus as dèidh sin tha a ghaoth gan sgapadh. 'S ann anns a' Chèitein bu chòir an siol a bhith air a chruinneachadh

agus bu chòir dha a bhith air a chur cho luath sa ghabhas, air sgàth nach eil an siol idir seasmhach. Bu chòir an siol a chur ann an talamh mòine fliuch, searbhach.

Faodar gearraidhean a bhith air an toirt bho na trì difear chraobhan Seileach a chaidh ainmeachadh, bhon t-Samhain chun Ghearran. Bu chòir na gearraidhean a bhith air an toirt bho fhàs na bliadhna sin agus bu chòir an cur a-muigh ann an àite fàsghadh, no far a bheil dùil an cur, cho fad 's a bhitheas làrach fàsghorachd mu 50cm timcheall air gach gearradh. Faodar làraich fàsghorachd a stèidheachadh le stuth còmhdach no le stuthan ceimigeach, ach faodar cuideachd a dhèanamh le inneal.

### > Calltainn *Corylus avellana* L

'S e gnè dùthchasach tarraingeach a th'anns a' challtainn agus tha dlùth cheangal eadar e is mac-an-duine anns na h-Eileanan Siar. Bho thoiseach gu meadhan an linn Holocene tha an Calltainn air a bhith cudromach a-thaobh biadh bho na cnothan bha an fhiodh ga chleachdadh airson feansadh, a' tughadh sparran agus gual loisgte airson connadh (Savill, 1991). Bhathar cuideachd dhen bheachd gu robh cumhachdan draoidheil aig a' challtainn ann am beul-aithris Ceilteach. Bha trì chraobhan dhraoidheil ann, an Calltainn, an Caorann agus an Droigheann. An diugh, chan eil mòran chraobhan calltainn rim faighinn ann an coilltean nan Eilean Siar air sgàth 's gu



Grey willow regeneration, Reiligeadal, Isle of Harris. Ath-bheòthachadh seileach Glas, Reiligeadal

## > Hazel *Corylus avellana* L.

Hazel is an attractive native species that has a long history of association with humans in the Western Isles. Since the early to mid Holocene period Hazel has been used as an important food source in the form of nuts and as a source of wood for fencing, thatching spars as well as charcoal for fuel (Savill, 1991). Hazel was also believed to have magical properties in Celtic folklore and was one of the three trees of white magic, along with Rowan and Hawthorn. Today Hazel is a rare species in the make-up of the Western Isles woodland mosaic due to its attractiveness to grazing animals and its relatively short life span. Therefore, Hazel is an extremely valuable species in terms of habitat biodiversity and is a key species for protection under the NWHAP.

> **Origin & Range:** Native to Europe, North Africa and Asia Minor, Hazel can be found in all parts of Britain except the Shetland Isles. The species can inhabit areas up to 600m above sea level, but is most common in the Western Isles in coastal areas. The tree can grow up to 10m but seldom grows above 1.5-2m in height in the Western Isles.

> **Habitat:** moderately acidic soils, damp, not waterlogged, can withstand high levels of exposure and also performs well on basic dry soils.

> **Bark:** Grey/brown in colour sometimes shiny with horizontal pores or **lenticles**.

> **Leaves & Buds:** Buds are ovoid and smooth, leaves are obovate, **cordate** with double toothing which is irregular. Leaves are deep green in colour on the upper side and pale and pubescent on the underside.

> **Flowers & Fruit:** Catkins start developing in autumn with male catkins first appearing brown/yellow in colour, turning pale yellow from December to April. Male catkins are approximately 5cm long. Female flowers are ovoid with scales and are light green in colour with red/brown styles protruding from the flower which are 2mm in length. These styles are released post pollen shed. Although male and female flowers exist on the same plant Hazel cannot self pollinate and separate plants are needed for pollination. Post pollination the Hazels characteristic nuts are formed ripening from September onwards, usually dropping in October. Nuts are pale green when immature turning a deep brown when ripe, nuts are 1.5-2cm in length and ovoid in shape with well defined bracts cupping the nut.

> **Propagation:** Hazel can be propagated using several methods. The first of these methods is to grow the plants

from seed.

Seed should first be **scarified**, and then **stratified**, in the case of Hazel nuts they should be soaked in warm water for 48 hrs, dried and then kept warm for at least two weeks at 20°C, followed by 3-4 months cold stratification at 5°C in a refrigerator. When treating seeds to stratification they should be stored in a plastic bag filled with a moist substrate which should be composed of half and half mixture of peat/leaf litter and coarse grit or perlite (Agate, 1991). Once or twice a week check the seeds, as they require oxygen and therefore the bags need to be opened. Also remove dead or mouldy seeds and check the moisture levels of the medium. Finally mix the medium well. Once the seeds start to show signs of germination (**Chitting**) remove them and sow immediately. When sowing make sure the seeds **radicle** faces into the growth medium, the medium can be composed of a typical mixture of fine grit and compost.

Hazel can also be propagated by conventional vegetative techniques such as layering and hardwood cuttings

**Layering is a relatively simple method** of plant propagation and involves interrupting the flow of nutrients along new growth suckers in mature plants. Layering should be performed in autumn and



Hazel, Calltairn.



bheil beathaichean a tha ag ionaltradh gu math dèidheil orra agus cho goirid is a tha beatha challtairn co-dhiù. Mar sin, tha a Challtairn gu math priseil dhuinn a thaobh àrainn bith-iomadachd agus tha e air a dìon fo NWHAP.

> **Tùs agus Raon:** Ri fhaighinn anns an Roinn Eòrpa, Afraga a Tuath, Mion Àisia agus gheibhear e anns a h-uile pàirt de Bhreatainn ach a-mhàin eileanan Shealtainn. Seasaidh a chraobh ann an àitean suas gu 600m os cionn ìre na mara, agus 's ann faisg air a' mhuir as cumanta a chithear e as na h-Eileanan Siar. Fàsaidh a chraobh suas gu 10m ach s ann ainneamh a dh'fhàsas e bhos cionn 1.5-2m anns na h-Eileanan an Iar.

> **Àrainn:** talamh beag-shearbhach, taiseach gun a bhith na bhoglach, seasaidh a' challtairn ri bhith glè fhosgailte ach fàsaidh e cuideachd ann an talamh tioram.

> **Rùsg:** Dath Glas/donn, uaireannan gleansach le pòran còmhnaid.

> **Duilleagan agus Gucan:** Tha na gucan leth-chruinn agus còmhnaid, tha na duilleagan leth-chruinn, air chumadh cridhe le bioran dùbailte nach eil riaghailteach. Tha na duilleagan dorch uaine air an uachdar agus soilleir molach gu h-ìosal.

> **Measan agus Dithean:** Tha caitean a tòiseachadh a nochdadh as t-Fhoghar le na caitein fhìreann a' tionndadh donn/buidhe, agus soilleir buidhe bhon Dùbhlachd chun Mhàrt. Tha na caitean fireann mu 5cm a dh'fhaid. Tha na ditheanan boireann leth-chruinn, le lannan soilleir uaine le stoidhlean dearg/donn a tha mu 2mm rim faicinn anns an dithean cuideachd. Tha na stoidhlean air an sgaoileadh an dèidh am poilean falbh. Ged a tha dithean fireann

agus boireann air an aon chraobh, chan eil e comasach do chraobh calltairn an obair poileanaidh a' dhèanamh leis fhèin, tha feum air craobhan eadar dhealaichte. As dèidh poileanadh tha na cnothan a' tighinn gu ìre, ag abachadh anns an t-Sultain agus a tuiteam anns an Dàmhair. Tha na cnothan soilleir uaine mus tig iad gu ìre agus a' tionndadh dorch dhonn nuair a tha iad air abachadh, tha na cnothan 1.5-2cm a dh'fhaid agus leth-chruinn le bràctan coileanta a cumail nan cnothan.

> **Sioladh:** Gabhaidh an calltairn a' shioladh ann an difear dhòighean. 'S e chiad dòigh tro bhith a' fàs na craobhan bho siol. Bu chòir an siol a sgòradh agus an uairsin an còmhach, agus le cnothan a' challtairn bu chòir dhaibh a bhith air am bogadh ann am bùrn blàth airson dà latha, a bhith air an tioramachadh agus an cumail blàth airson mu dà sheachdain aig 20°C, agus an dèidh sin le còmhachd fuar aig 5°C ann am frids airson 3-4 mìosan. Nuair a tha siol ga chòmhachd bu chòir an stòradh ann an бага plastaig air a lìonadh le ùir fliuch leth mu leth mòine/seann dhuilleagan agus morghan no perlite (Agate, 1991). Uair neo dhà san t-seachdain thoiribh sùil air an t-siol, tha feum aca air ocaidean agus mar sin feumaidh na pocanan a bhith air am fosgladh. Thoiribh as siol a tha air bàsachadh agus a th'air a dhol liath agus cumaibh sùil air do cho fliuch is a tha an ùir. Mu dheireadh measgaichibh an ùir gu math. Aon uair is gu bheil an



involves pegging young present growth year suckers to the soil and covering with soil at the point of contact. Roots should form over a period of 6 months, after which the suckers can be separated from the parent plant.

**Traditional hardwood cuttings** can also be performed on Hazel. Cuttings should be taken from new growth October to December, and should be 1cm in diameter and 15-30cm in length. Cuttings should then be planted in a sheltered position up to two thirds the depth of the cutting, preferably south facing and with well drained soil.

#### > **Holly *Ilex aquifolium* L.**

Holly is a small evergreen tree native to Britain that can be found in a wide range of habitats and soil types and can grow up to 15m in height. In the Western Isles the species is most commonly found on cliffs and steep coastal areas where grazing is restricted (Figure 5), as it provides welcome fodder to deer in the winter due to its evergreen nature. Holly is extremely hardy and can be found at altitudes of 550m. It tolerates saline laden winds due to its waxy **cuticle**, which protects it from exposure and water loss through **transpiration**. The species is surrounded by strong mythology and is associated

with Christmas, white magic and the Celtic summer to winter solstice.

> **Origin & Range:** Holly prefers wetter and milder climates found in the west coast of Britain as this allows the plant to take moisture in through the roots during the winter due to the decreased likelihood of ground frosts in comparison to the drier, colder east coast. The species is also native to Southern, Central and Western Europe and to the Mediterranean.

> **Habitat:** Holly can be found in a wide range of habitats and tolerates a wide range of soil types from damp acidic peats to well drained calcareous soils and nutrient poor soils. The species tolerates high degrees of shading and can become a dominant sub species in beech and oak woods.

> **Bark:** Smooth and grey, often with a striated buff and warts, younger wood on twigs is shiny and green in colour.

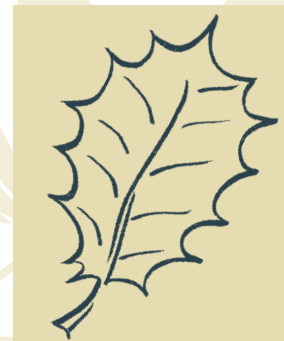
> **Leaves & Buds:** Leaves are evergreen and can vary greatly dependant on their location on the tree. Leaves lower down the tree and on the outer limits of the crown tend to be oblong-elliptical and highly spiny, whereas, leaves in the upper reaches of the crown and in the interior tend to be decreasingly spiny and ovate. Buds are very small, conic and green, all leaves

last for around 3 years before **abscission**.

> **Flowers & Fruit:** Holly is almost entirely dioecious, although hermaphrodite individuals are known to occur. Separate individuals are needed for fertilisation after pollination by bees. Flowers are white and occur from the leaf axils from April to May, leading to green berries (7-10mm) in July. These berries then mature over winter and ripen for June the following year, leading to the characteristic red berries. Berry production starts when the plant reaches 20 years of age, but maximum production does not occur until year 40.

> **Propagation:** Holly can be propagated via layering (takes two years) and cuttings (12 months) using the same technique as used to propagate Hazel. It can also be propagated by seed using the following technique:

1. Collect the seed in June/ July.
2. Remove the outer soft flesh



siol a' nochdadh comharran torrachaidh, togaibh iad agus cuiribh iad san talamh sa bhad. Nuair a tha sibh dhan cuir dèanamh cinnteach gu bheil freumhan an t-sil a' dol dìreach dhan ùir, ùir a dh'fhaodas a bhith dèante bho measgachadh de mhorghan min agus mathachadh.

Bu chòir a' challtainn a bhith air a shìoladh tro dhòighean àbhaisteach fàs-mhorachd mar còmhach agus gearraidhean cruaidh-fhiodh. S e dòigh an ìre mhath sìmplidh a th'ann an còmhach airson sìolachadh phlantrais le bhith a mùchadh sruth mathachaidh air am fàs ùr ann am plantrais abaich. Bu chòir seo a dhèanamh as t-Fhoghar le bhith a' ceangal bun-fhàs na bliadhna sin ris an talamh agus ga chòmhdach le ùir. Bu chòir freumhan nochdadh as dèidh mu sia mìosan, agus as dèidh sin

fodaidd na buinnean a bhith air an toirt air falbh bhon a phlantrais màthaireil. Tha e cuideachd comasach gearraidhean traidiseanta cruaidh-fhiodh a dhèanamh air a' Challtainn. Bu chòir gearraidhean a ghabhail bho fàs ùr bhon Dàmhair chun Dùbhlachd, 1cm a leud agus 15-30cm ann am fad. Faodar an uairsin na gearraidhean a chur dhan talamh ann an làrach fàsach suas gu dà thrian de dhòimhneachd a ghearraidh, a coimhead gu deas agus ann an talamh far nach eil uisge a laighe.

#### > **Cuilleann *Ilex aquifolium* L.**

'S e craobh beag sìor-uaine a tha dùthchasach do Bhreatainn a th'anns an Cuileann agus gheibhear e ann an iomadh àrainn agus talamh eadar-dhealaichte agus fàsaidh e suas gu 15m a dh'àrd. Anns na h-Eileanan Siar's ann air creagan no ann an àitean cas faisg air a mhuir a chithear e far nach eil e cho furasta dha beathaichean ionaltradh (Dealbh 5), agus tha seo a' toirt fodar math dha fiadh 's gu bheil e sìor-uaine. Tha a chuilleann gu math seasmhach agus chithear e ann an àitean cho àrd ri 550m. Air sgàth 's gu bheil còmhach cèireach air, seasaidh e far a bheil tòrr salainn as an ghaoth. Tha an còmhach seo ga dhion bhon aimsir agus bho bhith call uisge tro na duilleagan. Bha ceangal làidir aig an cuileann ann am beul-aithris co-cheangailte ri àm na Nollaig, droigheachd gheal agus gu seas-ghrian Samhradh gu Geamhradh nan Ceilteach.

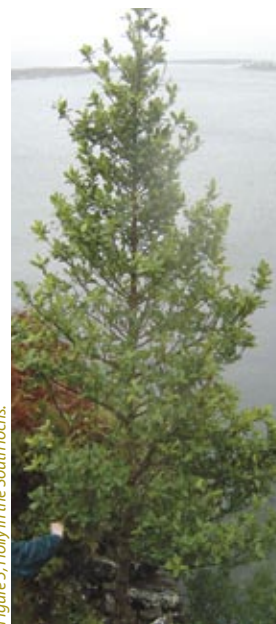
> **Tùs agus Raon:** Tha an cuileann riarachichte le aimsir fliuch, socair mar a gheibhear air taobh an iar Bhreatainn air sgàth is gu bheil seo a' ciallachadh gun urrainn dhan chraobh uisge a thoirt a-steach tro na freumhan rè a gheamhradh air sgàth is nach eil uiread de reothadh ann sa bhiodh air a chòst an ear far a bheil e nas tiorama is nas fhuara. Tha an cuileann cuideachd ri fhaighinn ann an Ceann a Deas, Meadhan agus taobh an Iar an Roinn Eòrpa agus cuideachd anns na Meadhan Thìrean.

> **Àrainn:** Gheibhear an cuileann ann an iomadh difear àrainn agus fàsaidh e ann an difear sheòrsa talamh bho talamh mòinteach gu talamh le tòrr caic ann agus talamh far nach eil mòran mathachas. Fàsaidh an gnè seo ann an àitean far nach eil mòran de sholas na grèine agus gabhaidh e làmh an uachdar ann an coiltean faidhbhile agus darach.

> **Rùsg:** Rèidh agus glas, glè thrìc le meileabhaid srianach agus foinnean, tha am fiadh ùr air na geugan gleansach le dath uaine.

> **Duilleagan agus Gucan:** Tha na duilleagan sìor-uaine agus tha iad gu math eadar-dhealaichte a-rèir 's càit a bheil a chraobh. Tha na duilleagan aig bonn na craoibhe agus aig an fhìor mhullach, leth-chruinn, slàn agus gu math biorach, ach mar as fhaise a tha iad air a chrann tha iad chan eil iad cho biorach. Tha na gucan gu math beag, bideanach agus uaine, agus mairidh na duilleagan mu

Dealbh 5. Cuileann ann an Ceann a Deas nan Lochs. Figure 5. Holly in the South Lochs.



by pulping and scarify hard seeds using abrasive materials. This is essential as the outer fruit contains germination inhibitors.

3. **Clean off flesh** and stratify for 2-4 weeks in a warm moist sand based medium, beginning in late summer.

4. **Stratify in the cold** for 12-20 weeks in the same moist sandy medium. Once seeds germinate plant on into a cold frame.

5. **Alternately** carry out parts 1-2 and then place in damp sand trays outside for 16 months before sowing.

Holly has a deep dormancy period, so patience is essential as the seed will need two winters and one summer to germinate.

#### > **Juniper** *Juniperus communis* L.

Juniper is one of three native conifers to the British Isles and is a priority species under the UK Biodiversity Action Plan. The species comes in two subspecies; the 'Tree' juniper and the 'Dwarf' juniper, the latter of which is found in the Western Isles. Juniper has been recognised for its medicinal properties for treatment of stomach ailments and for its use in adding flavour to gin.

> **Origin & Range:** Juniper is found from Northern Europe through to South West Asia



Figure 6, Juniper at Tolsta, Dealbh 6, Aiteann aig Tolstachd.

and North America. 'Tree' juniper can be found on many soil types including chalk downs in the south of England, limestone areas in Northern England and on acidic moors and heaths throughout Britain, especially the Scottish Highlands. 'Dwarf' juniper is usually confined to coastal or mountain areas as found in the Western Isles, and can be found in surprisingly exposed sites as illustrated in Figure 6.

> **Habitat:** Juniper is an indicator species for low soil nitrogen levels and is generally found in soils with pH levels at the high and low levels of the scale. In the Western Isles juniper can be

found on rocky crags and cliffs. This is a result of either overgrazing or under grazing in coastal areas.

> **Bark:** 'Dwarf' juniper bark is red/brown with thin paper like strips peeling off the main stem. The bark becomes lighter and greyer with age and on old stems can take on a petrified wood appearance.

> **Leaves & Buds:** Leaves are acicular and come in whorls of three. They are pointed and "prickly" to the touch. Foliage is blue/green in colour turning brown and dry in the inner area of the shrub.

> **Flowers & Fruit:** Male flowers are yellow due to their pollen and are present

thru bliadhna mus tuit iad.

> **Measan agus Dithean:** Gu bitheanta tha na cuileann dà-ghnèitheach, ged a tha cuid sònraichte aon-ghnèitheach. Tha feum air craobhan air leth airson torrachaidh an dèidh seilleanan am poileanadh. Tha na ditheanan geal agus tha iad ri fhaicinn air na casan nan duilleag eadar a' Ghiblean agus a' Chèitein, mus tig dearcagan uaine (7-10mm) orra anns an luchair. Tha na dearcagan sin a tighinn gu ìre thairis air a' Gheamhraidh agus ag abachadh ron t-Òg Mhios an ath bhliadhna, nuair a tha dearcagan dearg a' tighinn orra. 'S ann nuair a tha an craobh fichead bliadhna a dh'aois a tha e a' tòiseachadh a' dèanamh dearcagan agus 's ann nuair a tha an craobh da fhichead a tha e a' cruthachadh an àireamh as motha de dhearcagan.

> **Sioladh:** Gabhaidh an cuileann a shìoladh tro bhith ga chòmhdach (2 bhliadhna) agus tro gheàraidhean (12 mìos) a cleachdadh an aon phròiseas ris a challtainn. Faodar cuideachd a thoirt bho siol a cleachdadh am pròiseas a leanas:

1. **Cruinnichibh an siol** anns an t-Òg Mhios/luchair.

2. **Thoiribh air falbh** an searcall air an taobh a-muigh agus pronnaibh e agus sgrìobaibh an t-sìol chruaidh. Tha seo cudromach air sgàth 's gu bheil bacaidhean gintinneachd anns a mheas.

3. **Glanaibh dheth** an searcall agus còmhdachibh an siol ann am measgachadh de ghainmheach fliuch, blàth

agus fàgaibh iad ann an sin airson mu 2-4 seachdainean, a' tòiseachadh aig deireadh an Samhradh.

4. **Còmhdach anns an fhuachd** anns an aon mheasgachadh de ghainmheach airson 12-20 seachdainean. Nuair a dh'fhàsas an siol cuir iad air frèama fuar.

5. **Faodadh sibh** pàirt 1-2 a' dhèanamh agus an uairsin an cumail ann an treidhichean le gainmheach fliuch airson sia mìosan deug mus cur sibh iad.

Tha an cuileann ann an inbhe chadaltach tòrr den ùine, agus bidh dà Gheamhradh agus aon Samhradh mus fhàs e, mar sin feumaidh sibh a bhith gu math foighidneach

#### > **Aiteann** *Juniperus communis* L

'S e an aiteann aon de thri craobhan-durcain a tha ri lorg gu nàdarrach ann am Breatainn agus tha an seòrsa craobh a tha seo air inbhe shònraichte fhaighinn bho Phlana Gnìomh Bith-lomadachd Bhreatainn. Tha dà fo-ghnè aig an seòrsa craobh a tha seo, ab craobh aiteann agus 's e am meanbh-aiteann an fhear a tha ri lorg anns na h-Eileanan Siar. Tha mac-an-duine air a bhith a' cleachdadh an aiteann mar chungaidh-leigheis airson bliadhnaichean mòra, gu h-àraidh airson daoine le trioblaidean stamaig, agus cuideachd airson blas a thoirt air gin.

> **Tùs agus Raon:** Tha an aiteann ri lorg ann an Ceann a Tuath na Roinn Eòrpa, Iar Dheas

Aisia agus Ameireaga a Tuath. Gheibhear craobh aiteann ann an iomadach seòrsa talamh, leithid an talamh cailc a th'ann an Ceann a Deas Shasainn, an talamh aoil ann an Ceann a Tuath Shasainn agus air na mòintichean agus monaidhean searbhach air feadh Bhreatainn, gu h-àraidh air Gàidhealtachd na h-Alba. Tha a meanbh-aiteann ri lorg nas fhaig air a mhuir no ann an aitean far a bheil beanntan, mar a chithear e anns na h-Eileanan Siar. Gheibhear lorg air ann an aitean gu math fosgailte mar a chithear ann an Dealbh 6. Àrainn – Chithear an aiteann a' fàs ann an talamh far nach eil mòran naitridean agus ann an talamh far a bheil an àireamhan pH aig ìre ard agus ìre ìosal a' chlàr. Anns na h-Eileanan Siar tha an aiteann ri fhaicinn ann aitean creagach, sgorach. Tha seo mar thoradh air cus ìonaltradh no ro bheag de dh'ìonaltradh ann an sgìrean oirthir.

> **Rùsg:** Tha rùsg a mheanbh-aiteann dearg/donn le pìosan tana mar phàipear a bhitheas a' tighinn bho chrann na craoibhe. Tha an rùsg a' fàs na soilleire agus nas glàs mar is sine a bhios e fàs agus air seann chrann tha e coltach ri còmhdach chloiche.

> **Duilleagan agus Gucan:** Tha cruth snàthaid air na duilleagan agus tha trì duilleagan còmhla. Tha iad cuideachd biorach. Tha na duilleagan gorm/uaine agus a' fàs donn agus tioram ann am meadhan na craoibh.

> **Measan agus Dithean:** Tha na dithean fireann buidhe air sgàth 's am poilein agus



in spring situated towards the end of the plants twigs. Juniper is dioecious and therefore female flowers are located on separate plants and are green and scaly in appearance. Once pollinated by the wind the female fruit swells to 6mm in length and changes colour over a period of 18 months from green to blue/purple. Each berry contains approximately 3-6 seeds which are highly attractive to birds and rodents.

> **Propagation:** Juniper is notoriously difficult to propagate from seed due to the seed's unpredictable dormancy characteristics which is an ecological adaptation mechanism to cope with unpredictable habitats. Propagation is also possible by vegetative methods, but this is not as desirable as it leads to a lessening in genetic diversification within a small base population.

#### Propagation by seed:

1. Collect seed and label with 8 figure grid reference, date and place name.
2. Remove berry flesh; soak seeds in a 1% solution of citric acid (eg orange juice) to mimic the action of a birds gut.
3. Place seeds in a 2:1 mixture of grit and peat for the stratification process.
4. Place seeds in a warm atmosphere 13 weeks at 20°C

keeping moist at all times.

5. Move seeds and substrate into a cold and moist atmosphere for 38 weeks at 0°C.

6. Finally place seeds and substrate in a moist atmosphere for a further 17 weeks at 4°C.

7. Sow seeds out in trays.

Alternatively perform steps 1-3 and then stratify at a temperature of 4°C for 30 weeks prior to sowing.

#### > Rowan or Mountain Ash *Sorbus aucuparia* L.

Rowan is perhaps the most abundant native tree species in the Western Isles with the exception of the Willow species, which technically speaking are considered woody shrubs rather than trees. Rowans strong population and wide geographical spread are due to its tolerance of poor soil



Rowan or Mountain Ash, Caorann no Uinnseann-beinne

types, high exposure levels and its berries attractiveness to birds leading to high levels of successful propagation through bird movement. As with other tree species Rowan is restricted to areas beyond the reach of grazing animals as well as areas where birds perch such as cliffs, crags and gullies. Rowan has traditionally been planted for its berries and, as following celtic folklore tradition, as a means of warding off witches.

> **Origin & Range:** Native to all parts of Britain, especially frequent in the North West of Scotland where it can be found to an altitude of 1000m, which is higher than any other species.

> **Habitat:** Rowan can colonise most soil types but is rare on clays and soft limestone. It is a light demanding pioneer species and usually grows to 5-10m in height. The species is multi-stemmed and bush-like at high altitudes.

chithear iad air ceann na failleanan anns an Earrach. Tha an aiteann dà-ghnèitheach agus mar sin tha na dithean boireann air difear chraobhan agus tha iad uaine agus lannach. Nuair a ghaoth air am poileanaidh tha an dithean boireann aig at gu mu 6mm a dh'fhaid agus atharraichidh an dath thairis air ochd mìosan deug bho uaine gu gorm/purpaidh. Tha eadar trì agus sia pìosan beaga siol anns gach dearcag agus tha iad seo gu math tarraingeach dha eòin agus creimeadairean.

> **Sioladh:** Tha e doirbh dha rìreabh aiteann a shìoladh air sgàth's nach eil an ùine cadaltach aca cunbhalach, agus s e innleachd eigeòlais a tha seo gus coinneachadh ri àrainnean duilich. Tha sìoladh comasach cuideachd tro dhòighean fàs-mhorachd ach chan eil seo cho ion-mhiannaichte air sgàth is gu faodadh lùghdachadh a thighinn air leudachadh gintinneachd le cho beag is a tha an àireamh de chraobhan.

#### Sioladh:

1. Cruinnichibh an siol agus comharraichibh e le sonrachadh clàr 8 àireamhan, ceann-latha agus ainm an àite far an deach a lorg.
2. Glanaibh an searcall bho na dearcagan, agus cuiribh an siol am bogadh ann an measgachadh de 1% dha uisge-searbh (mar sùgh orains), gus a bhith coltach ri na bhios a tachairt ann an goile eòin..
3. Cuiribh an siol ann am measgachadh 2:1 de mhorghan min agus mòine

airson a chòmhdach.

4. Cumaibh an siol ann an àite blàth aig 20°C airson trì seachdainean deug agus dèanaibh cinnteach gu bheil uisge gu leòr a' dol air an t-siol.

5. Gluaisibh an siol còmhdaichte gu àite fuar fliuch aig 0°C airson trìchead sa h-ochd seachdainean.

6. Mu dheireadh cuir an siol còmhdaichte a dh'àite fliuch airson seachd seachdainean deug aig 4°C.

7. Cuir an siol ann an treidhichean.

Dh'fhaodadh sibh cuideachd ceumannan 1-3 a ghabhail agus an uairsin an còmhdach aif 4°C airson 30 seachdain mus tèid an cuir.

#### > Caorann Uinnseann-beinne *Sorbus aucuparia* L

An dèidh an Seileach is iongantach mur e an Caorann an craobh dùthchasach is bitheanta anns na h-Eileanan an Iar, ged a thathar a coimhead air an seileach mar phreas. Tha an caorann cho lionmhor agus sgapte air sgàth is gu bheil e seasmhach ann an talamh bochd, ann an àitean far a bheil e glè fhosgailte. Tha na dearcagan tarraingeach do dh'eòin agus tha sin a' cuideachadh le barrachd sìoladh shoibhreachail. Mar craobhan eile tha an caorann ri fhaighinn ann an àitean far nach eil e comasach do bheathaichean faighinn faisg agus ann an àitean creagach far a bheil eòin ri fhaighinn. 'S ann airson na dearcagan



Rowan or Mountain Ash, Caorann no Uinnseann-beinne

a bha an caorann air a chuir agus bha ceangal aige ri beul-aithris Ceilteach far an robh iad a' smaoinneachadh gu robh cumhachdan sònraichte aige ann a bhith a' cumail bana-bhuidhich air falbh.

> **Tùs agus Raon:** Dùthchasach do Bhreatainn, agus gu math cumanta ann an Iar Thuath na h-Alba far am faighear e suas gu 1000m a dh'àrd agus tha seo nas airde na craobh sam bith eile.

> **Àrainn:** Fàsaidh an caorann an ìre math ann an talamh sam bith ach chan fhaicear tric e ann an talamh crèadh no talamh aoil. Tha an caorann ag iarraidh solas na grèine agus fàsaidh e far nach robh craobhan roimhe agus ruigidh e suas gu mu 5-10m a dh'àrd. Tha iomadh cas air a chraobh agus tha coltas preas air ann an talamh àrd.

> **Rùsg:** Tha an rùsg soilleir glas agus rèidh, a' tionndadh glas/donn le fleacan beaga soilleir mar as sine a dh'fhàsas e.

> **Duilleagan agus Gucan:** Tha coltas itean air na duilleagan,

> **Bark:** Rowan bark is light grey and smooth, turning grey/brown and lightly scaled with age.

> **Leaves & Buds:** Leaves are pinnate, 20-22cm long with 9-15 sessile, crenate-serrate leaflets. Leaves are bright green when first flushed turning deep green when mature, leaves appear in early April and turn a beautiful shade of red in autumn. Buds are ovoid (1.7cm in length), scaly and dark purple/brown in colour.

> **Flowers & Fruit:** Flowers are creamy white approximately 1cm in diameter and open in May. Berries are orange/red and are mature from early August.

> **Propagation:** Rowan berries are easily identified and readily available for collection from August onwards. Once collected the berries should be macerated to remove the germination inhibiting flesh. Stratify the seeds for 2-4 weeks at 20°C, followed by cold stratification for 14-20 weeks at 2-5°C. Seed should then be sown outdoors in a 2:1 grit/peat mixture until germination occurs.

For a more in-depth guide to tree propagation please consult the British Trust for Conservation Volunteers (BTCV) Handbook entitled 'Tree Planting & Aftercare' (Agate, 1991).

## 5. Native Woodland Protection and Expansion

Regeneration of semi-natural woodlands as previously mentioned is a priority under the WIWS and the NWHAP. The basic premise for natural regeneration of semi-natural woodland is control of damage by exclusion of stock and wildlife. In the Western Isles the four main species responsible for reduced tree cover are:

- < Domestic livestock – sheep and cattle.
- < Red Deer *Cervus elaphus*
- < Rabbits *Oryctolagus cuniculus*
- < Blue hare *Lepus timidus*

For control of these species there are several methods including; fencing, individual tree shelters, shooting (non domestic species only) and trapping (for rabbits). For guidance on control please contact your local SNH office



Figure 7. Allt Voligair, South Uist. Dealbhn 7. Allt Bholagair, Uibhist a Deas.

or Northern Constabulary Wildlife Liaison Officer. The most suitable method for regeneration is exclusion by fencing using deer, stock or rabbit specific fencing. A good guide to fencing practice for use in forestry is 'Forest Fencing' (Pepper, 1992) which gives a detailed breakdown of the equipment and materials needed for successful protection. Other factors that should be considered when planning a woodland natural regeneration scheme are: seed trees, ground vegetation, prominent wind direction and visual impact. In general protection schemes should have a timescale of 15 years to allow for successful tree establishment, after which time fencing can be removed. An example of a successful native woodland natural regeneration scheme is Allt Voligair in South Uist (Figure 7) which has SSSI status.

mu 20-22cm a dh'fhaid le 9-15 duilleagan beag cruinn oireach ceangailte. Tha na duilleagan soilleir uaine nuair a dh'fhosglas iad agus a' tionndadh dorcha uaine nas fhaide den bhliadhna, tha na duilleagan a' tighinn air a' chraobh tràth anns a' Ghiblean agus a' tionndadh dath àlainn dearg as t-Fhoghar. Tha na gucan leth-chruinn (1.7cm a dh'fhaid), lannach, agus dorch phurpaidh/donn ann an dath.

> **Measan agus dithean:** Tha na dithean geal agus 1cm a leud agus a' fosgladh anns a' Chèitein. Tha na dearcagan orains/dearg agus a' tighinn gu ìre tràth sa Lùnastal.

> **Sioladh:** Tha dearcagan a chaorainn furasta an aithneachadh agus tha iad deiseal airson an togail bhon Lùnastal. Nuair a thèid an cruinneachadh bu chòir na gucan am bogadh gus an searcall a tha a cuir bacadh air gintinneachd a thoirt air falbh. Còmhdaichibh na gucair airson 2-4 seachdainean aig 20°C, agus an dèidh sin còmhdaich fuar airson eadar 14-20 seachdainean aig 2-5°C. Bu chòir an uairsin an cuir a-muigh ann a measgachadh 2:1 de mhorghan min agus mòine gus am fàs iad.

Ma tha thu airson sùil nas mionaich a thoirt air a bhith a' sioladh chraobhan thoiribh sùil air am pasgan a dh'fhoillsich an British Trust for Conservation Volunteers (BTCV) air a bheil an t-ainm 'Tree Planting and Aftercare' (Agate, 1991).

## 5. Dion agus Leudachadh air na Coilltean Dùthchasach

Tha an WIWS agus an NWHAP a toirt prìomhachas do dh'ath-bheothachadh coilltean leth-nàdarra. Is e bun-stèidh ath-bheothachadh choilltean leth-nàdarra smachd a chumail air call tro bhith a glasadh a-mach stoc agus fiadh-bheatha. Anns na h-Eileanan an Iar is iad na leanas na ceathrar bheathaichean as motha rin coireachadh airson call air chraobhan:

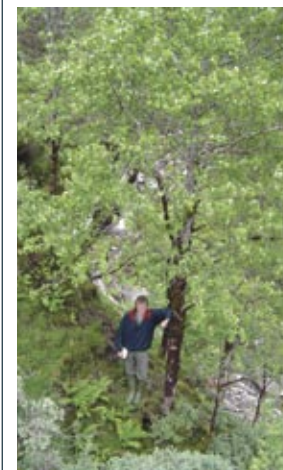
- < Caoraich agus crodh
- < Fiadh dearg *Cervus elaphus*
- < Coineanaich *Oryctolagus cuniculus*
- < Geàrr ghorm *Lepus timidus*

Airson smachd fhaighinn air na beathaichean seo tha dìfear nithean a ghabhas dèanamh; feansadh, fasgaidhean chraoibh, losgadh le gunna (beathaichean fiadhaich a-mhàin) agus inneal-glaicaidh (airson coineanaich) Airson tuilleadh fiosrachaidh mu smachd cuiribh fios gu Oifis Ionadail SNH no Oifigear Ceangal Fiadh-bheatha Poilis a Chinn a Tuath.

Is e an dòigh as fheàrr air ath-bheothachadh beathaichean a chumail a-mach le bhith a' cleachdadh feansa sònraichte airson fiadh, stoc, no coineanaich. Airson iùil air modhan feansaich ann an coilltean thoiribh sùil air 'Forest Fencing' (Pepper 1992) a tha toirt fiosrachadh mionaideach air uidheam agus stuth a dh'fheumar airson dìon shoirbheachail. Bu chòir cuideachd



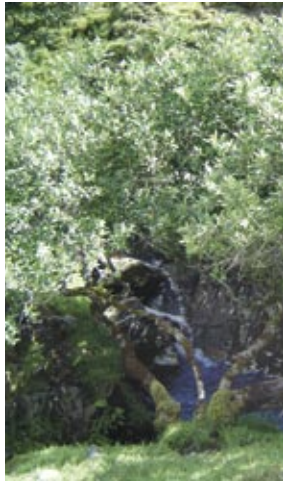
Aspen regeneration, Reingeadal, Ìle of Harris. Ath - bheothachadh Critheann, Reingeadal, Na Hearadh.



Aspen, Boglass, Ìle of Harris. Critheann, Bogha Glas, Na Hearadh.

beachdachadh air cùisean eile nuair a thàtar dealbh sgeama ath-bheothachaidh coille dùthchasach mar: craobhan le sìol, fàs-mhorachd talmhainn, àrd bitheanta na gaoithe, agus buaidh air sealladh an àite. Anns a choisceann, bu chòir sgeamaichean dìon mairsinn mu 15 bliadhna gus am bi craobhan stèidhichte, agus an dèidh sin faodar na feansaichean a thoirt air falbh. Tha eisimpleir mhath de sgeama shoirbheachail





## 6. Information Sources

Scottish Natural Heritage  
[www.snh.gov.uk](http://www.snh.gov.uk)

Trees for Life  
[www.treesforlife.org.uk](http://www.treesforlife.org.uk)

Further information can be obtained on the Comhairle web site at [www.cne-siar.gov.uk/woodlands](http://www.cne-siar.gov.uk/woodlands) and from Forestry Commission Scotland at [www.forestry.gov.uk/scotland](http://www.forestry.gov.uk/scotland)



Rowan regeneration and Aspen, Boglass, Isle of Harris. Ath-bheòthachadh Coarann agus Critheann Bogha Glas, Na Hearadh.

## 7. Bibliography

Agate, E. 2004. *Tree Planting and Aftercare, a practical handbook*. BTCV, Doncaster.

Allaby, M. 1998. *Dictionary of Ecology*. Oxford University Press.

Gifford, J. 2000. *The Celtic Wisdom of Trees, Mysteries, Magic and Medicine*. Godsfield Press LTD, Hants.

Helms, J.A. 1998. *The Dictionary of Forestry*. CABI Publishing, Oxon.

Lawrence, E. 2000. *Hendersons Dictionary of Biological Terms*, 12th Edition. Prentice Hall, London.

Rodwell, J., Patterson, G. 2001. *Creating New Native Woodlands*. Forestry Commission Bulletin 112, HMSO, London.

Savill, S. 1998. *The Silviculture of Trees used in British Forestry*. CAB International, Oxon.

a-thaobh ath-bheothachaidh coille dùthchasach ri fhaicinn ann an Allt Bholairig ann an Uibhist a Deas (Dealbh 8) aig a bheil inbhe SSSI.

Gheibhear tuilleadh fiosrachaidh air làrach lin na Comhairle, aig [www.cne-siar.gov.uk/woodlands](http://www.cne-siar.gov.uk/woodlands) agus cuideachd bho Choimisein nan Coilltean aig [www.forestry.gov.uk/scotland](http://www.forestry.gov.uk/scotland)

## 6. Far am faighear tuilleadh fiosrachaidh

Dualchas Nàdar na h-Alba  
[www.snh.gov.uk](http://www.snh.gov.uk)

Trees for Life  
[www.treesforlife.org.uk](http://www.treesforlife.org.uk)

## 7. Bibliography

Agate, E. 2004. *Tree Planting and Aftercare, a practical handbook*. BTCV, Doncaster.

Allaby, M. 1998. *Dictionary of Ecology*. Oxford University Press.

Gifford, J. 2000. *The Celtic Wisdom of Trees, Mysteries, Magic and Medicine*. Godsfield Press LTD, Hants.

Helms, J.A. 1998. *The Dictionary of Forestry*. CABI Publishing, Oxon.

Lawrence, E. 2000. *Hendersons Dictionary of Biological Terms*, 12th Edition. Prentice Hall, London.

Rodwell, J., Patterson, G. 2001. *Creating New Native Woodlands*. Forestry Commission Bulletin 112, HMSO, London.

Savill, S. 1998. *The Silviculture of Trees used in British Forestry*. CAB International, Oxon.



Grey willow, Maraig, Isle of Harris. Seileach Glas, Maraig, Na Hearadh.

## 8. Glossary

Abscission	Separation of a part from the rest of the plant, namely the leaves
Acicular	Small and needle-like bristle
Acuminate	Tapering to a point
Acute	Ending in a sharp point
Air porosity	The percentage of the total bulk volume of rock or soil occupied by air filled pores.
Bole	A trunk or main stem of a tree
Calcareous	A soil containing sufficient calcium carbonate to effervesce visibly when treated with cold hydrochloric acid.
Calcicole	A plant that lives in calcareous soils
Carr	Deciduous woodland or scrub on a permanently wet organic soil
Chasmophyte	A plant that grows in a rock crevice
Chitting	Treating seed to encourage the primary

Cordate	Heart shaped
Cuneate	Wedge shaped
Cuticle	Layer of waxy material on the outer layer of epidermal cells in many plants restricting the movement of water
Dioecious	Having male and female flowers on separate plants
Glabrous	Smooth even surface without hairs
Holocene	Recent geological epoch following Pleistocene, began 10,000 years ago
Lenticels	Pores in periderm of trees allowing passage of air into internal tissues
Macrofossil	A fossil large enough to be examined without a microscope
Obovate	Inversely egg shaped and attached at the pointed end
Ovate	Egg shaped and attached at the broad end
Palynological	Referring to pollen and its distribution

Petiole	The stalk of a leaf
Pioneer	First tree species to colonise a site
Pinnate	Compound leaf with leaflets on each side of the leaf axis
Pubescent	Covered with soft hair or down
Radicle	Embryonic plant root
Scarified	Chemical, mechanical, heat or moisture treatment of seeds to make the seed coat permeable to water to initiate germination
Stipules	One or two leaf like brackets at the base of the leaf stalk
Stratified	Differentiation of horizontal layers of soil
Transpiration	Evaporation of water through stomata of plant leaves and stems
Undulate-serrate	Wave-like undulations in leaves with saw tooth edge

## 8. Liosta Mineachaidh

Dealachadh	Nuair a tha pàirt a' falbh bhon phlantrais, gu sònraichte na duilleagan
Cumadh Snàthaid	Pìosan beaga air chumadh snàthaid
Gobach	A tighinn biorach aig ceann na duilleig
Biorach	Glè bhiorach aig ceann na duilleig
Pòranas àile	Na tha de dh'àile sa cheud de chreag no ùir air chòmhdach le pòran làn àile
Crann	Crann na craoibhe
Cailceach	Talamh anns a bheil carbonate cailceach a bhrachdas nuair a thèid searbhag haidhydrocloraic fuar air.
Càrr[d11]	Coille le craobhan a chailleas an duilleach agus a th'air talamh organach a tha daonnan fliuch.
Chasmophyte	Plantrais a dh'fhàsas ann sgor air creag
Seotadh	A brosnachadh siol gus an tig am prìomh fhreumh

Cumadh Cridhe	Le cumadh cridhe air.
Cumadh Spalla	Le cumadh spalla air
Cneas	Sreath de stuth cèireach air taobh-muigh ceallan epidearmach plantraisean a tha toirt buaidh air gluasad uisge.
Dà-ghnèitheach	Dithean fireann agus boireann air plantraisean air leth.
Rèidh	Uachdar rèidh gun fhionnadh.
Holocene	Àm eòlas-talmhainn a'leantainn Pleistocene a thòisich bho chionn 10,000 bliadhna.
Pòran	Pòran ann an rùsg na craoibhe a' leigeil àile gu na nithean a tha fàs a-staigh.
Macrofossil	Fossil a tha mòr gu leòr ri fhaicinn leis an t-sùil.
Cumadh Ugh	Cumadh ugh agus ceangailte aig a cheann is bioraich.
Cumadh Ugh	Cumadh ugh agus ceangailte aig a' cheann is leotha.
Palynological	Ann an dàimh

Cas	Cas an duilleig
Craobh tuineachaidh	A chiad gnè chraoibh gu làrach a thuineachadh
Cumadh iteach	Duilleag le mion-duilleagan air gach taobh den druim
Molach	Còmhdach le fionnadh
Bun-fhreumh	Freumh plantrais a tha ri ùr fhàs.
Sgriobta	Dòigh gintinneachd le bhith sgriobadh taobh muigh an t-sil le stuth ceimigeach, innealan, teas no uisge.
Sorchain	Sorchan no dhà aig bun cas na duilleig.
Còmhdach	Difear sheòrsa ùir ann an sreathan.
Call uisge	Call uisge tro dhuilleach agus tro casan nan duilleag.
Tonn-bhiorach	Cumadh htonnan air duilleagan le oir mar sàbh bhiorach





Coimisean na Coilltearachd Albac  
Forestry Commission Scotland



< **NATIVE WOODLANDS IN THE WESTERN ISLES**  
a guide to their restoration

**COILLTEAN DÙTHCHASACH NAN EILEAN SIAR** >  
seòladh airson ath-shuidheachadh

Pelican Design Consultants | www.pelican-design.com  
Photographs courtesy of:  
Forestry Commission, Comhairle nan Eilean Siar, Trees for Life, Steven Liddle.