

Upland Birchwoods in Scotland Habitat Action Plan

1. Current status

1.1. Scope of this plan

1.1.1 This plan refers exclusively to birch-dominated woodlands in the Scottish uplands.

1.1.2 There are fewer extensive stands of upland birchwoods in England, Wales and Northern Ireland, and (for HAP target purposes) any relevant work should be credited to the closest alternative HAP type (e.g. upland oakwoods, upland mixed ashwoods or wet woodlands).

1.1.3 The management of all stands of semi-natural birchwoods in the uplands should comply with the Forestry Commission's Forest Practice Guide no.6 *Upland Birchwoods* (FC, 1994). The extent to which birch is naturally the dominant tree species will depend upon the ecological conditions, woodland history and recent management. Climate favours birch dominance at high altitude, as in the far northwest and in the cool, boreal east and central highlands. Past management may have resulted in the predominance of birch at the expense of other species, because the latter have either been selectively removed (usually for timber), or are less adaptable, or more susceptible to browsing by sheep or deer. Whatever the degree of naturalness, this plan assumes that the management of birchwoods will normally reflect their current composition, and aim for the natural diversification of composition according to the site.

1.2. Biological status

1.2.1 Upland birchwoods in Scotland are dominated by a series of stands of downy birch (*Betula pubescens*) and/or silver birch (*Betula pendula*) with constituents such as rowan, willow, juniper and aspen (Hall and Kirby, 1998). Boundaries are often diffuse and liable to change as woodlands expand and contract in response to fires and changes in grazing pressure (Kirby, 1984). Refuges, such as those occurring on cliffs or rocky patches, may develop permanent tree cover that might contain more diverse and less mobile species (Kirby, *pers. comm.*). On more acidic soils, rowan is a prominent component, and juniper can form the underwood in the eastern highlands. Aspen grows on a variety of site types where mineral soil is present (Worrell, 1996), occurring frequently within Upland birchwoods as small groups and rarely as extensive stands. Only 12 stands of aspen greater than 5 hectares are known to exist within Scotland.

On all but the most acidic sites, birch influences the soil to allow development of a grass-herb flora on sites previously dominated by dwarf shrub heath. This successional development appears to be cyclical in nature with the ground flora of many senescent birchwoods eventually returning to heath as tree cover is lost (Miles, 1988). Heavily grazed woodlands tend to develop a grass and moss dominated flora (McVean and Ratcliffe, 1962; Patterson, 1993) and, where the sward has been changed due to heavy stocking of sheep or cattle, the return to heath may not happen so readily.

1.2.2 Upland Birchwoods are included in the following main National Vegetation Communities:

W11 *Quercus petraea* - *Betula pubescens* - *Oxalis acetosella* woodland

- (a) *Dryopteris dilatata* sub-community
- (b) *Blechnum spicant* sub-community
- (c) *Anemone nemorosa* sub-community
- (d) *Stellaria holostea* -*Hypericum pulchrum* sub-community

W17 *Quercus petraea* - *Betula pubescens* - *Dicranum majus* woodland

- (a) *Isoetes macrospora* - *Diplophyllum albicans* sub-community
- (c) *Anthoxanthum odoratum* - *Agrostis capillaris* sub-community
- (d) *Rhytidiadelphus triquetrus* sub-community

- W4 *Betula pubescens* - *Molinia caerulea*
(a) *Dryopteris dilatata* - *Rubus fruticosus* sub-community
(b) *Juncus effusus* sub-community

Small base-rich patches (W9 - *Fraxinus excelsior* - *Sorbus aucuparia* - *Mercurialis perennis* woodland) and wet areas (W7 - *Alnus glutinosa* - *Fraxinus excelsior* - *Lysimachia nemorum* woodland) are locally frequent but where these occur over extensive areas, they should be referred to the appropriate priority habitat (Hall and Kirby, 1998). W4a and b¹ are included within upland birchwoods even when they occur extensively, as their transition to W11 and W17 becomes harder to define where wetter site conditions prevail (Kirby, *pers. comm.*). Soil-related differences tend to be masked by striking climatically-influenced similarities (Rodwell, 1991).

1.2.3 Birchwoods appear within Peterken's Stand types as 12A (rowan-birchwoods) and 12B (hazel-birchwoods), (Peterken, 1981). The division of the two types is based on presence or absence of *Corylus*. This follows the earlier classification by McVean and Ratcliffe. Small components of 1D (western valley ash-wych elm woods), and 3C (northern calcareous hazel-ash woods), may occur in base-rich patches and 7A (valley alder woods on mineral soil), and 7D (slope alder wood), may occur in wet stands with alder (Hall and Kirby, 1998). Some birchwoods may naturally move towards stand types 6A (upland sessile oakwoods), 11A (acid birch-pinewoods) or 3C (northern calcareous hazel-ash woods). Birch may naturally dominate higher elevation components of these respective stand types.

1.2.4 The upper boundaries, even of high elevation woodlands, are often below the natural tree line; an area that would normally be dominated by rowan and birch scrub, (in most cases downy birch, thought by some to be a sub-species² in this situation) . Natural tree lines form an important niche for dwarf birch (*Betula nana*), its hybrids with taller birches, and other scarce species.

1.3. Links to species action plans

1.3.1 Upland birchwoods are important habitats for a number of notable species (including some UKBAP priority species) whose requirements should be taken into account during the implementation of this plan. These include juniper³ (*Juniperus communis*), the following moths: Welsh clearwing (*Conopia scoliaeformis*), Kentish Glory (*Endromis versicolora*) and the Rannoch sprawler (*Brachionycha nubeculosa*); the following butterfly: pearl-bordered fritillary³ (*Boloria euphrosyne*); the following Diptera: *Lonchaea ragnaria*, *Lonchaea limatula*, *Mycetobia pallipes*, *Clusiodes apicalis* and *Tachypeza heeri*. The following species are dependant on aspen: the dark-bordered beauty moth³ (*Epione parallelaria / vespertaria*), the blunt-leaved bristle moss³ (*Orthotrichum obtusifolium*) and the aspen hoverfly³ (*Hammerschmidtia ferruginea*) (Cosgrove *et al.*, 2002).

1.3.2 The following are examples of rare bryophytes associated with upland birchwoods, occurring also in oakwoods and hazel; *Adelanthus decipiens*, *Drepanolejeunea hamatifolia*, *Lophozia longidens*, *Plagiochila punctata*, *Radula aquilegia* and *Riccardia palmata*.

1.3.3 A range of structural conditions are desirable within upland birchwoods to provide appropriate habitat for the species described. These include: presence of deadwood, contiguous mosaics of open space, regeneration, thicket stage, mature and veteran trees.

1.4 Extent of the habitat

1.4.1 There are no precise data on the total extent of upland birchwoods in the UK. MacKenzie (1999) estimated the total area in Scotland to be about 64,000 hectares, but Kirby (using estimates derived from the Ancient Woodland Inventories of the mid-1980s) suggested it could be about 36,000 ha (FC, in press). This difference is partially attributed to the proportion of wet woodlands considered to fall within upland birchwoods, as the combined areas of birchwoods and wet (birch dominated)

¹ W4c is regarded as part of the Wet Woodlands HAP. It occurs on wetter sites with deeper peat than the other sub-communities, with a field layer dominated by *Molinia caerulea* and *Sphagnum* species.

² Various referred to as *Betula pubescens* sub-species *odorata*, *tortuosa* or *carpatica*.

³ UK Biodiversity Action Plan Priority species.

woodlands in Scotland given by both MacKenzie and Kirby are 76,000 hectares and 71,000 hectares respectively. Recent work by Scottish Natural Heritage has allowed an estimate to be made based on the Native Woodland Model and the Scottish Semi-Natural Woodland Inventory (Stone, *pers. comm.*). For the purposes of setting targets in this plan, the overall area is assumed to be 45000 ha of upland birchwood.

1.4.2 Overgrazing and replanting with non-native species have resulted in many losses of upland birchwoods. On the other hand substantial areas have been established in the last 10 years with further areas approved under the Woodland Grant Scheme. However, due to their relative isolation from existing stands of semi-natural birchwood and/or soil type the latter may not be ideally located to achieve the specific aims identified in section 4.1. The restructuring former conifer areas and the restoration of birchwoods on ancient woodland sites has also increased the area of birchwood.

2. Current factors affecting the habitat.

2.1 The majority of upland birchwoods are not in 'favourable condition' (JNCC, 1998) due to one or more of the following factors:

- Overgrazing – seen as the main threat to this habitat as a result of increased sheep and deer numbers (Staines *et al*, 1995; DCS, 2000). Rabbits are also a serious problem in some areas. Many woodlands have been lost due to low rates of recruitment from regeneration. There is some evidence that increasing dominance of sheep over cattle grazing has also been detrimental due to a greater level of birch browsing (Adams, 1975) and less ground disturbance (to create niches where the woodland can regenerate). The diversity of species of trees, shrubs and herbs, has also declined through grazing/ browsing.
- Agricultural use of land adjacent to, and within, upland birchwoods – this has increased competition from aggressive colonising grasses and reduced prospects for successful natural regeneration of birch.
- Regular burning of heather moorland – this is also a serious obstacle to the regeneration of birch. When it impinges on existing woodland, it can also have detrimental effects on other aspects of birchwood biodiversity (eg. loss of epiphytic lichens on very old trees).
- Felling and underplanting with non-native conifer species – this was extensively practised from the 1950s to the 1980s, and, on many sites, the conifers will now have shaded out typical birchwood vegetation. Sites that have retained many of the components of semi-natural woodlands should now be prioritised for restoration. High priority sites will usually be located within a network of existing semi-natural woodland.
- Fragmentation and isolation of individual woods – this has led to a restricted distribution of the less mobile species associated with this woodland type.
- Failure of tree-line woodlands to respond to reductions in browsing pressure or burning –due to slow rates of colonisation.
- Climate change – this may affect the composition of ground flora and ease of natural regeneration

3. Current action

3.1. Legal status

3.1.1 Since 1985 national forest policy has included a presumption against clearance of broadleaved woodland for conversion to other land uses or to conifer plantations, and in particular seeks to maintain the special interest of ancient semi-natural woodland. Felling licences are normally required from the Forestry Commission if the woodlands concerned are not managed under a plan

approved by them. Some woods may receive additional protection through policies and strategies within development plans.

3.1.2 Designation as Sites of Special Scientific Interest (SSSI) ensures that Scottish Natural Heritage is consulted over management operations and development proposals where birchwoods are a notified feature.

3.2. Management, research and guidance

3.2.1 All woodlands should be managed in accordance with the UK Forestry Standard (FC, 1998).

3.2.2 Grants for, and advice on, the management and regeneration of birchwoods, including planting and some other operations, are available from Forestry Commission, and in some circumstances from other government agencies and local authorities. The Rural Stewardship Scheme and the Environmentally Sensitive Areas Schemes require participants to avoid damaging areas of woodland by not cultivating the ground or applying pesticides, lime or fertiliser, and ensuring that livestock are managed to prevent poaching. Local woodland initiatives, eg. Highland Birchwoods and Scottish Native Woods, promote the management and expansion of these woods in their areas.

3.2.3 The Forestry Commission's Forestry Practice Guides to the management of Upland Birchwoods and Wet Woodlands were first published in 1994 (FP Guides 6 & 8 respectively). Management should follow these guides as well as other FC guidelines in order to qualify for grant aid or felling licences. Patches of other woodland types (e.g. oakwood, ashwood or pinewood) may occur in mosaic within birchwoods, and the appropriate management guide should be referred to. There should be an assumption against actively converting birchwoods thought to be in a seral stage, into oakwoods or pinewoods. Guidance on ways of creating new native woodland is available in Forestry Commission Bulletin 112. The most appropriate locations for new birchwoods can be identified using the Forestry Commission's Ecological Site Classification System (Ray, 2001). Similarly guidance is available on the role of birchwoods in the creation of Forest Habitat Networks (Ratcliffe *et al.*, 1998).

3.2.4 Woodland management advice is available locally through Forestry Commission, Scottish Natural Heritage and the voluntary and commercial sectors (e.g. the Scottish Wildlife Trust, Scottish Agricultural College and local woodland initiatives). Additional advice is available from members of professional bodies such as the Institute of Chartered Foresters and from the Forestry and Timber Association.

3.2.5 Research is undertaken by various bodies and individuals. These include Forest Research (eg. on methods for achieving natural regeneration, deer management), Scottish Natural Heritage (eg. on monitoring change in minimum intervention stands), university departments (eg. on tree improvement), and by other groups (eg. the Royal Museum of Scotland - monitoring *Lepidoptera* species in upland birchwoods).

4. Action plan objectives and proposed targets.

4.1 The objectives of this plan are to reverse the adverse trends affecting upland birchwoods in recent years, namely fragmentation, neglect, mismanagement or conversion to other woodland. In addition there is a need to improve their ecological condition and to re-establish their ecological function(s) in the Scottish landscape. Such work should specifically include the following:

- Ensuring the survival of existing birchwoods particularly those that are declining or senescent and are likely to be lost in the next 20 years;
- Facilitating the natural dynamics of birchwoods by encouraging expansion of core areas through colonisation of adjacent ground and the development of uneven-aged mosaics of woodland and other habitats.
- Providing greater cohesion of woodland ecosystems by developing effective Forest Habitat Networks;

- Re-creating more natural tree lines along upper woodland margins;
- Protecting and expanding existing aspen stands (in particular those currently over 5ha in extent) and allowing their expansion, including the use of a proportion of aspen in degraded semi-natural woodlands where the species is currently absent.

4.2 The plan has the following quantitative targets. These should be reviewed, and may need to be adjusted (as necessary to achieve the above objectives) during the course of the plan.

- T1. Maintain the total extent (approximately 45,000 ha) and distribution of upland birchwoods allowing some fluctuation in the boundaries of individual woods to accommodate natural dynamics.
- T2. Maintain the current area and distribution of ancient semi-natural upland birchwoods (estimated as 36,000 ha), keeping within current boundaries wherever possible.
- T3. By 2010, initiate management to achieve favourable condition⁴ in 50% of the total upland birchwoods resource.
- T4. By 2015, achieve favourable condition⁴ over 50% of the total upland birchwoods resource.
- T5. By 2010, initiate management to achieve favourable condition⁴ in all upland birchwood areas within designated sites (particularly SSSIs and NNRs) where birchwoods are a notified feature.
- T6. By 2015, achieve favourable condition⁴ over all upland birchwoods within designated sites where birchwoods are a notified feature.
- T7. By 2010, restore site-native species on 900ha⁵ of former upland birchwoods that have been converted to non-native plantations on ancient woodland sites. Select sites with good remnant habitats and those adjacent to existing long-established native woodland.
- T8. By 2015, restore site-native species on a further area of 900ha⁵ of former upland birchwoods that have been converted to non-native plantations on ancient woodland sites; site selection as in T7 above.
- T9. By 2010, establish 2250ha⁶ of upland birchwoods on unwooded sites or by conversion of non-native plantations. Where possible, natural colonisation is preferred to planting. A range of speeds of colonisation and/or scales of planting to develop a greater range of structural diversity and species composition should be encouraged. Special attention should be paid to the re-creation of natural tree lines, particularly where opportunities arise to expand the upper boundaries of high elevation native woodland, and to increasing the connectivity of aspen stands.
- T10. By 2015, establish a further area of 2250ha⁶ of upland birchwoods on unwooded sites or by conversion of non-native plantations; site selection as in T9 above.

5. Proposed actions with lead agencies

5.1. Policy, legislation and strategic planning

5.1.1 Agree regional allocation of the overall HAP targets (FC, SNH, LBAPs).

⁴ Where favourable condition cannot be achieved in the short term the minimum target will be 'unfavourable-recovering' (JNCC 1998). This condition will include a significant proportion of standing and lying deadwood

⁵ T7 and T8 combined are based on 10% of the area of upland birchwoods converted to plantations in Scotland since 1930.

⁶ T9 and T10 combined are based on 10% of the existing resource.

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5.1.2 By 2004, agree criteria for identifying appropriate areas for restoration and expansion of upland birchwoods (focusing on those aims identified in 4.1 and avoiding other priority habitats), liaising as necessary with the Upland HAP group (FC, SNH).

5.1.3 By 2004, develop methods for assessing the condition of upland birchwoods suitable for use on both designated and undesignated sites (FC, SNH).

5.1.4 By 2004, initiate sample surveys of woodland condition (FC, SNH).

5.1.5 Incorporate criteria identified in 5.1.2 into Indicative Forestry Strategies and Local Forestry Frameworks (FC, SNH, LA's).

5.1.6 Support the implementation of the Deer Commission for Scotland's "*Wild Deer in Scotland: a long term vision*", and in particular that "the management of local deer populations will.... play a constructive role in the stewardship of natural habitats" (DCS, SNH, FC, SEERAD).

5.1.7 Identify losses of ancient woodland and develop policies and procedures to minimise further loss. (FC, SNH, LA's)

5.2. Site Management

5.2.1 Develop and promote the use of long-term management plans (20 years +) and Forest Design Plans to implement the management, restoration and expansion of Upland Birchwoods in publicly and privately owned forests (FC, LA's, FTA).

5.2.2 Contribute to the implementation of relevant priority species action plans, by integrating the management of upland birchwoods with the requirements of those priority species (see section 1.3) (FC, SNH, SAP lead partners, LBAPs).

5.2.3 Encourage the delivery objectives and targets of this HAP through Local Biodiversity Action Plans (FC, SNH, NGO's, LBAP partnerships).

5.3 Advisory

5.3.1 By 2006, review (and if necessary revise and re-issue) the Forestry Practice Guides to the Management of Semi-Natural Woodlands no. 6 & no. 8 (Upland Birchwoods and Wet Woodlands respectively), and other relevant Guidelines and advisory material (FC, SNH).

5.3.2 Provide advice to land managers on grazing and silvicultural regimes, appropriate to the geographical distribution and ecological variation found in this habitat. Promote the management of deer and rabbits in areas where they are (or might become) major limitations to achieving the specific objectives of this plan (FC, SNH, SEERAD, DCS, SAC, Local Woodland Initiatives).

5.3.3 Develop and promote training on the conservation and management of upland birchwoods, including advice on the marketing and sustainable use of products, and safeguarding and enhancement of high value features such as stands of aspen and fragments of tree line woodland (FC, SEERAD, SNH, Woodland Initiatives).

5.3.4 By 2010, identify a small number of sites that can potentially be used to demonstrate good practice (FC, SNH, Local Woodland Initiatives).

5.4. International

5.4.1 By 2004, develop links with Scandinavian organisations to exchange experience on research and management (FC, SNH).

5.5. Monitoring and research.

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5.5.1 By 2004, develop and implement systems for recording the occurrence, distribution, management and composition of upland birchwoods, based on the National Inventory of Woodland and Trees, and explore opportunities to make this information widely available through the National Biodiversity Network initiative (FC, NBN, LRCs, SNH).

5.5.2 Investigate the relationships and dynamics of this habitat in relation to other priority habitats with which it commonly occurs (Upland Heath, Upland Oakwoods, Upland Mixed Ashwoods, Wood Pasture & Parkland, Native Pinewoods and Montane habitats) (FC, SNH Universities, CEH, MLURI).

5.5.3 Research efforts to recreate tree line woodland and develop criteria to predict where success is most likely (FC, SNH, CEH, Highland Birchwoods).

5.5.4 Support research on the integration of livestock and birchwoods management to promote biodiversity and natural regeneration of upland birchwoods (FC, SNH, SEERAD, MLURI, SAC).

5.5.5 Investigate the ecological distinctiveness of upland birchwoods (SNH, FC, CEH).

5.5.6 Establish monitoring programmes in substantial sites (100 ha +) as areas of minimum intervention core forest and regeneration zones. Within these areas, undertake detailed structure, process and species monitoring to validate monitoring methodology (see 5.1.3). Where possible, select woodlands that include large (5ha+) stands of aspen and/or dwarf birch (FC, SNH).

5.5.7 Monitor restoration of upland birchwoods so that future restoration efforts can be focused on sites most likely to show a positive response (FC, SNH).

6. Financial considerations

6.1 The successful implementation of this habitat action plan will have resource implications for the private, voluntary and public sectors.

6.1.1 It is suggested that, by 2011, the success and appropriateness of the Scottish Forestry Grant Scheme, and other funding mechanisms, in encouraging the desired management and achievement of the targets in this HAP be monitored, and adjusted as required (FC, SNH, SEERAD). If necessary, additional funding from other sources (such as HLF) should be applied for.

7. Key references.

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