Forestry Commission Scotland

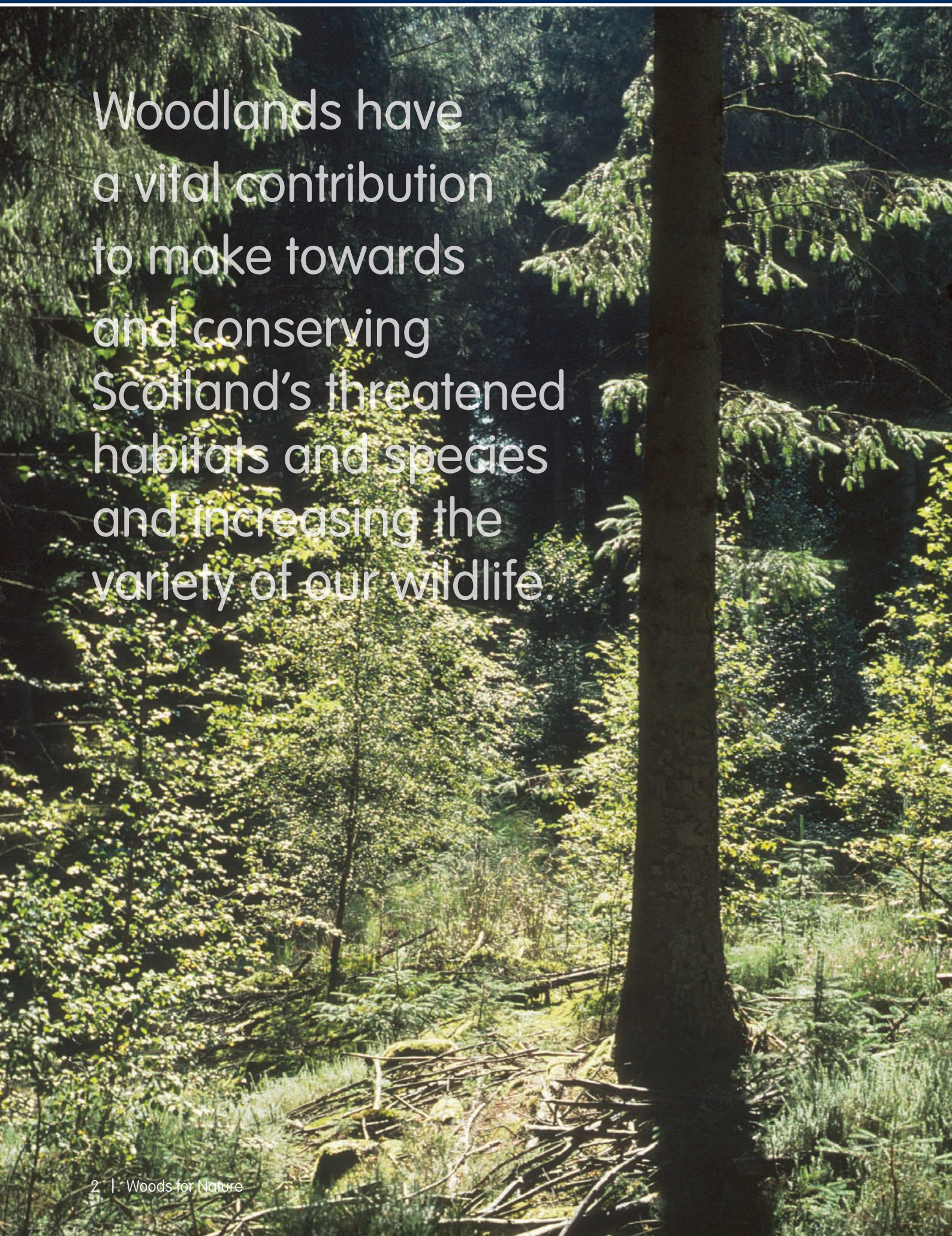
Delivery

Woods for Nature

Our Biodiversity Programme 2008-2011

The Scottish Government

Forestry Commission
Scotland



Woodlands have a vital contribution to make towards and conserving Scotland's threatened habitats and species and increasing the variety of our wildlife.

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Forestry Commission Scotland and Biodiversity

Woodlands have a vital contribution to make towards conserving Scotland's threatened habitats and species and increasing the variety of our wildlife.

Wildlife is also one of the main things that people value about woodlands when they visit them.

Forestry Commission Scotland has a strong history of active engagement in conservation work, both in our management of the national forest estate and through our support for good practice and conservation work in privately owned woodlands.

And as a public body we now have a duty under the Nature Conservation (Scotland) Act 2004 to further biodiversity conservation, and to help deliver the Scottish Biodiversity Strategy[1] (SBS).

The Scottish Forestry Strategy[2] published in 2006 reflects the aims of the SBS, and we have now reviewed our own biodiversity effort to make sure we will play a leading role in delivering both strategies.

This publication sets out our priorities and main actions for biodiversity over the period 2008/09 to 2010/11.

[1]www.scotland.gov.uk/publications
[2]www.forestry.gov.uk/sfs

Our Biodiversity Aims

We aim to help deliver the overall objectives for biodiversity in the Scottish Forestry Strategy (SFS), and the Scottish Biodiversity Strategy (SBS).

1. Help to halt the loss of biodiversity and reverse previous losses through targeted action for species and habitats.
2. Broader action for biodiversity at a landscape or ecosystem scale.
3. Increase awareness and public enjoyment of woodland biodiversity.
4. Improve knowledge of biodiversity, and ensure it is integrated into decision-making.

What are we going to do?

Our programme is aligned to the key actions identified for biodiversity in the Scottish Forestry Strategy. We will focus particular effort on the priority actions from the Strategy which are marked **(P)**.

1. Help to halt the loss of biodiversity and reverse previous losses through targeted action for species and habitats

Help to safeguard designated nature sites (P)

The most important sites for nature conservation in the country are Sites of Special Scientific Interest (SSSI), and European Union (EU) designations of Special Areas of Conservation and Special Protected Areas. The Scottish Government has set a target of 95% of designated features to be in good condition by 2010. Scottish Natural Heritage (SNH) has assessed their condition and found that even after allowing for work over the last few years, 134 designated woodland features (around 13,700 hectares) need to be brought into positive management to achieve the 95% target. Nearly all these areas are in private ownership and not currently in any grant scheme.

We have worked with SNH, Deer Commission Scotland (DCS) and Scottish Government Rural Payments and Inspections Directorate (SGRPID) to develop a Scottish Programme for Protected Woodland Sites[3] for improving these features, which will focus mainly on persuading owners to take up suitable management with support from the new Scottish Rural Development Programme[4] (SRDP).

Sunart Oakwoods SAC

The Atlantic oakwoods complex around Loch Sunart is designated as a Natura site for its outstanding collection of lower plants including lichens, mosses, liverworts and ferns, as well as butterflies and birds. In the 18th and 19th centuries, many historically open and mixed woods were transformed to oak monoculture and coppiced intensively for the tanning and iron smelting industries. Industrial use of these woods ended in the mid to late 19th century and some of them have remained largely undisturbed since. But conifers such as Sitka spruce were introduced to some woods in the mid 20th century and rhododendron colonised from surrounding areas. Funding from EU LIFE funds, Forestry Commission Scotland grants, SNH Natural Care and from Forest Enterprise Scotland has allowed a restoration programme which encouraged collaboration between owners to fence, cull deer and remove conifers and rhododendron. Some thinning has also been done in mature oakwoods to diversify stand structure. The project has created rural employment and developed local skills. The Natura sites are now recovering towards favourable condition, and this now needs to be sustained by maintenance work, e.g. to remove rhododendron seedlings.

[3]www.forestry.gov.uk/sppws
[4]www.scotland.gov.uk/srdp

The main threats are widespread browsing by deer or sheep, which affects 90% of the area in poor condition, and invasive non-native trees and shrubs such as rhododendron. It takes time to develop suitable schemes in these cases especially where collaborative effort by several landowners is required. But we expect that at least 3000 ha annually will come into management to improve condition during the next three years. A substantial programme of work is already underway on the land managed by Forestry Commission Scotland (the national forest estate). Condition improvements should be in progress on all woodland features on our land by 2010.

We will also help to safeguard woodland sites designated for particular *wildlife species*, working with owners and SNH to choose the right management for their needs.

- With SNH, DCS and SGRPID support, we will lead implementation of the Scottish Programme for Protected Woodland Sites to improve the condition of designated woodland sites on both private woodlands and the national forest estate.

Through our management of the national forest estate, and by promoting suitable SRDP measures, we will help to restore or improve the condition of those *open designated sites* where forests are clearly causing damage to the site, such as at some blanket or raised bog sites. We will also continue to try to protect designated rivers and lochs, mainly by careful application of the Forest and Water Guidelines and participation in catchment planning.

- We will work with SNH to help prevent or reverse damage to non-woodland designated sites that is caused by woodland.

Help meet targets for priority habitats under the UKBAP, especially native woodland habitats and open habitats associated with woodlands (P)

We have a lead role under the UK Biodiversity Action Plan (UKBAP) for native woodland priority habitats in Scotland, and we will continue to focus on leading delivery of the Habitat Action Plan (HAP) targets in Scotland for expanding native woodland area, improving the condition of existing native woods and restoring native woods from non-native plantations on ancient woodland sites (PAWS).

We have supported a significant native woodlands expansion since the 1990s, mainly in the uplands and for native pinewoods in particular. More effort now needs to be made to improve native woodland condition and restore PAWS, and also to expand the other priority habitat types such as wet woods, ashwoods and lowland mixed broadleaves. We will also focus on linking and expanding native woodland remnants to form forest habitat networks, which should increase the resilience of our woodland ecosystems to pressures such as climate change. Both new planting and conversion from non-native plantations will be used to expand our native woods.

Lowland mixed broadleaved woods are typically fragmented and expansion is challenging. Habitat network planning is helping us to target incentives.

Improving condition by naturalising Scots pine plantations

Many even-aged Scots pine plantations in northern and eastern Scotland were planted on natural pine sites on infertile sandy soils. They can gradually develop into a more complete pinewood ecosystem as they mature, and this process can be hastened by silvicultural management to increase structural and species diversity. In Moray this has been tried by Forest Enterprise Scotland on a range of sites using group selection felling, shelterwood thinning methods and ground disturbance techniques. This has encouraged natural regeneration of pine, rowan, birches and the development of understorey plants like blaeberry, which is an important source of food and cover for young capercaillie. This sort of naturalising work for planted native woods contributes to targets for improving native woodland condition.

Scottish HAP Targets for 2005/06 -20014/2015 (total for all native woodland types) are:

- Expand 40,500ha
- Improve condition 54,000ha
- Restore 9,000ha

To help achieve HAP targets we will seek minimum *annual* outcomes for the three years of this programme of 4,500ha of expansion, 6,000ha brought into management to improve condition (including designated and other woods), and 1000ha of non-native PAWS put into restoration toward native woodland.

For some PAWS sites complete restoration to native woodland will not be the best option, and partial restoration work to safeguard and enhance remnant ancient woodland features may be more suitable. We encourage careful consideration of restoration options for PAWS, both in forest design plans on the national forest estate and Forest Plans under the Scottish Rural Development Programme.

- We will lead the delivery of targets for Scotland's native woodland habitats. The national forest estate will contribute significantly, but most of our effort will be on promoting and supporting action in private woods
- We will also promote or carry out management of ancient woodland sites to maintain and enhance their remnant features, even where they will not be fully restored to native woodland.

Restoration of native woodlands

Highland cattle are being used as a forest management tool in Glen Garry pinewoods. After removal of planted spruce trees a dense carpet of young birch sprang up. Different grazing intensities are being tried in a long-term experiment to determine the effects on the density and composition of tree regeneration. We hope that controlled grazing can encourage a more diverse native woodland in future.

For *priority open habitats and wood pastures* our main effort for non-designated sites will be help to safeguard and enhance significant existing areas in and around woodlands, e.g. through sensitive location, design and restructuring of forests as opportunities arise at time of felling.

We may also support larger scale restoration from forest to open habitats in cases where there would be clear and significant net public benefits which outweigh our general presumption against deforestation. Removal of young trees is expensive, but grant support may be possible under the SRDP if the need is urgent. Aftercare such as livestock grazing to maintain open habitats needs to be carefully factored in to restoration projects.

- We will take suitable opportunities to enhance or restore priority open and wood pasture habitats on the national forest estate as we restructure forests, and will work with partners to promote this in private forests through the SRDP. We will publish proposals for open habitat restoration on the national forest estate within the period of this programme.

A natural transition from forest to open wetland can be a model for planted forests

Help meet targets for priority species associated with woodlands (P)

We have chosen 6 UK priority species as key species for widespread action and are developing specific programmes for these with partners under the Scottish Forestry Strategy. These 6 were chosen for special focus because:

- they are all declining and/or threatened, but still quite widely distributed;
- Scotland holds a large proportion of the UK population;
- forestry is important to their habitats and specific management needs have been identified, requiring action on a significant scale;
- they include woodland and woodland edge species and a range of lifeforms, and managing for these species should also have wider benefits for biodiversity.

Four of them are also on SNH's Species Action Framework list for action over the period to 2007/08-2011/12.

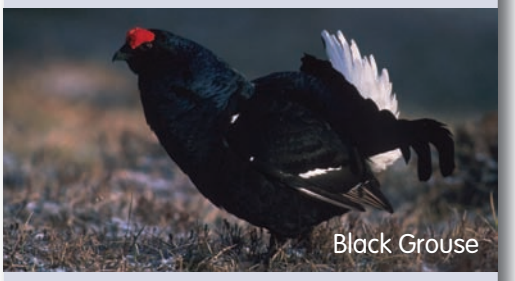
Forestry Commission Scotland key species and main partners

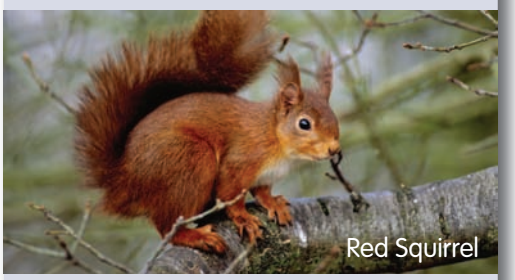
Capercaillie* (SNH, RSPB)
Black grouse* (RSPB, SNH, Game & Wildlife Conservation Trust)
Red squirrel* (SNH)
Juniper (Plantlife, SNH)
Pearl-bordered fritillary* (Butterfly Conservation, SNH)
Chequered skipper (Butterfly Conservation)
*Species Action Framework species

- We will work with partners to develop and implement programmes of action for six key species in Scottish woodlands, which will identify the actions we will take.

We have just published our programmes for capercaillie, black grouse and red squirrel, and will publish programmes for the other 3 key species during 2008/09. For Species Action Framework species our forestry proposals are being integrated with the work plans that SNH will publish.


Capercaillie


Black Grouse


Red Squirrel


Juniper


Pearl-bordered Fritillary


Chequered skipper

Twinflower - a characteristic plant of native pinewood

For the many other priority species found in woodlands the action we take will normally be smaller in scale, and should be integrated into broader habitat or forest management practices, or in some cases confined to survey or monitoring. These include 3 plant species for which Forestry Commission Scotland has a lead or co-ordinating role under the UKBAP: small cow-wheat, twinflower and Wilson's filmy fern.

The recent publication of extended UK and Scottish lists of priority species and habitats challenges foresters and other land managers to find ways of integrating species with habitats, and to develop an ecosystem-scale approach to management which avoids attempting to 'garden' for every species in a detailed way that will not be sustainable.

A new decision support system (Habitats, and Rare, Protected and Priority Species: HARPPS) will be launched in 2008 by Forest Research. It will allow managers to identify which priority or protected species and habitats may be present and summarises advice on their ecology and management. During the next three years it will need to be tested in practice, and developed to build in the implications of the revised priority lists.

- We will work with SNH and other Scottish Biodiversity Strategy partners to identify and develop guidance on how to conserve UK and Scottish priority species within woodland habitats and through wider land use policy.

Mabie Forest: a haven for butterflies

Mabie Forest near Dumfries is one of Scotland's richest sites for butterflies, with over 20 species recorded. They include three of the most endangered butterflies and moths in the UK: the Pearl-bordered Fritillary, Dingy Skipper and the Forester Moth. Forestry Commission Scotland and Butterfly Conservation joined forces in 2007 to create a nature reserve at the centre of Mabie Forest. It covers 100 hectares including ancient oak woodland, wetlands and grassland, as well as planted Sitka spruce. Areas of spruce are being replaced with native woodland through natural regeneration.

A sunny glade in Mabie Forest suited to pearl-bordered fritillary

- We will work with Forest Research to implement and refine the HARPPS decision support system.
- We will enhance recording of information on the distribution of species, through our own work and by encouraging volunteers.

Promote good practice to safeguard protected species (P)

We have published a suite of guidance notes, with help from SNH and RSPB. These guide woodland managers to take a practical and risk-based approach to safeguarding legally protected species when planning forest operations. We are keeping this guidance under review and will complete a series of 4 notes on European protected species in 2008.

- We will promote best practice for protected species amongst woodland owners and managers, working with SNH and others, and implement it on the national forest estate.

Provide advice to planning authorities to help ensure suitable protection of high biodiversity value woods in development policy

We are working with the Scottish Government Planning Directorate, SNH, local authorities and others to improve the awareness and understanding of woodland issues amongst planners and to help revise natural heritage development policy and guidance. We have developed a woodland toolkit; we are promoting the role of forest habitat networks and green networks in development plans, and through the Native Woodlands Survey of Scotland we will provide much enhanced baseline information for planners on woods of high conservation value.

- We will work with planners and other partners to strengthen the information base, awareness and protection of high biodiversity value woodland in the development planning system.

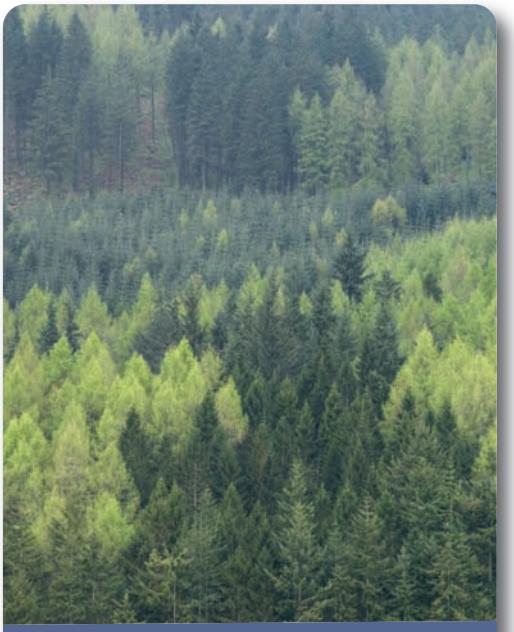
The Forester Moth - a new UK priority species

The three endangered species at Mabie Forest have very different habitat requirements: Pearl-bordered Fritillary depends on sunny open woodland with plenty of violets, Dingy Skipper needs short turf, bare ground and bird's-foot trefoil, while the Forester moth occurs in damp, lightly-grazed pasture with common sorrel. We are working with BC to develop suitable management methods and monitor populations.

Woodland network in the Clyde valley

2. Broader action for biodiversity at a landscape or ecosystem scale

Targeted action for priority habitats and species can only be effective if it is founded on a broader approach to diversifying forests and woodlands, which is in turn integrated into wider landscape or catchment scale planning. This larger-scale thinking has increasingly become part of good forest practice since the 1980s, and is incorporated into the UK Forestry Standard and the voluntary UK Woodland Assurance Standard, which Forestry Commission Scotland promotes and which we follow in managing the national forest estate. We need to build on this approach to continue to enhance woodland biodiversity.



Glentress forest: Mixed ages and species of conifers

Effort needs to be focussed mainly on refining forest planning and design to increase the benefits for biodiversity, using supporting guidance and tools. Often this can be done at little extra operational cost and in ways that increase other long term social, environmental and economic benefits from developing attractive woods with varied wildlife. But some key actions may be more expensive in the short term at least, such as increasing deer control, planting more native species and alternative conifers, and switching to Low Impact Silvicultural Systems (LISS) as alternatives to clear-felling and replanting methods.

We urgently need to factor in climate change impacts and adaptation strategies, but initial work must focus on research to understand what is needed – see section 4.

Reduce the impacts of deer on woodland biodiversity (P)

Deer are a key factor influencing biodiversity. They are a vital part of our natural heritage and when numbers are low they help to maintain biodiversity. But too often deer impacts are unacceptably high, preventing regeneration of trees, shrubs and even field layer plants. This is the main reason for unfavourable condition in designated sites, for example. We need to continue to work with partners and landowners to encourage deer management in private woods, and across neighbouring deer range areas, and also to reduce deer impacts on biodiversity on the national forest estate. These efforts should be directed firstly at protecting designated and priority habitats, but also aimed more widely at encouraging woodland diversity.

- We will work with Scottish Government Rural Payments and Inspections Directorate (SGRPID), Deer Commission Scotland (DCS) and SNH to promote collaborative deer management with support from SRDP grants, aiming to target areas containing designated sites and native woodlands for the greatest effort.
- We will target our deer management effort on the national forest estate to be as effective as possible in reducing negative biodiversity impacts from deer.

Stunted rowan sapling (above) and browsed holly understorey (below)

Plan woodlands to contribute to habitat networks (P)

The concept of planning woodlands to develop habitat networks at landscape and regional scales has been developed by Forestry Commission Scotland, SNH and Forest Research. Forest habitat networks help to reinforce core areas of native woods and reverse past fragmentation, and they could build long-term resilience in the face of climate change. They should cater for a range of woodland habitats and species, but their location needs to strike a balance with the needs of open ground biodiversity. All types of woodlands should be integrated into networks, but native woods will form the core areas. To help guide native woodland expansion at a strategic level, a series of regional reports have been published showing indicative forest habitat network maps and a regional breakdown of native woodland targets.

- We will continue to work with SNH and Forest Research to develop and test decision support tools to help users develop forest habitat network plans at various scales.
- We will promote woodland expansion and restructuring to strengthen forest habitat networks, using Forest Plans grant support for private woods and forest design planning on the national forest estate.
- We will work with SNH, Scottish Government Planning Directorate, local authorities and other stakeholders to embed Forest Habitat Network plans into Indicative Forestry Strategies, planning policy guidance and development plans, in order to guide woodland planning and the location of developments and green networks in urban areas.

We are working with Forest Research and local authority planners in the Lothians to include forest habitat networks in development plans.

Biodiversity is greatly enhanced by replacing riparian conifers with networks of open and native woodland habitats

Diversify planted woodlands

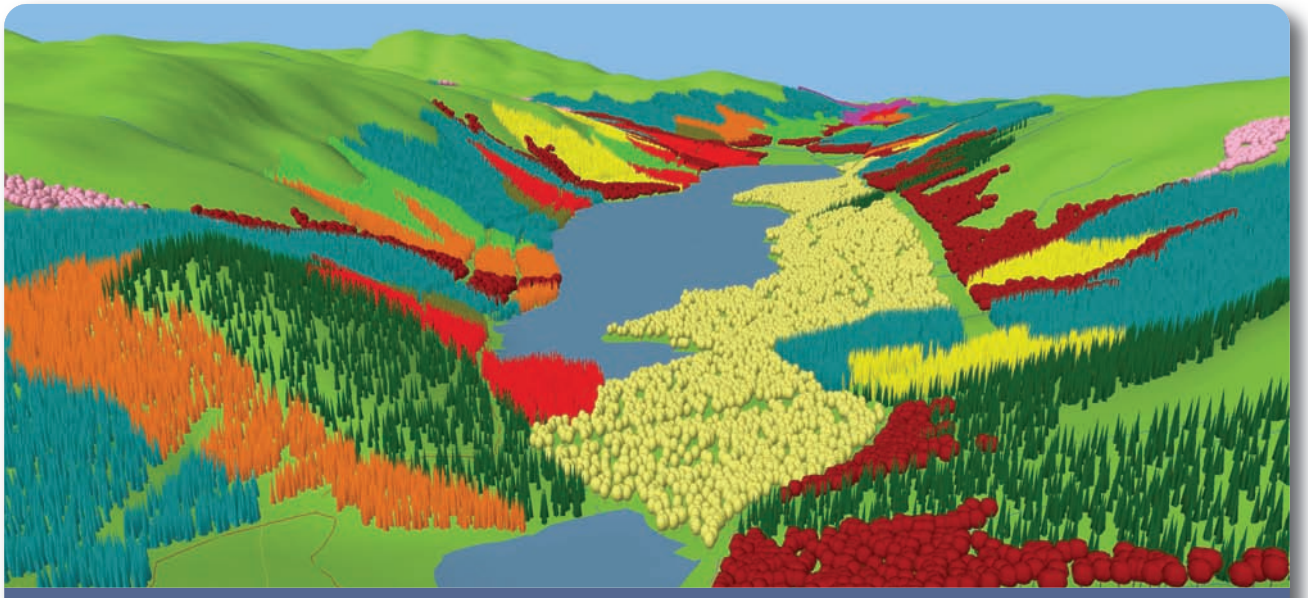
It has been normal practice since the mid 1990s to restructure 20th century planted forests when they mature in order to introduce a variety of age classes and species, and also to increase the open ground and native woodland components, especially in riparian corridors.

Restructuring often involves some sacrifice of future revenue for owners, because they need to fell some areas before or after the optimal felling age in order to create a more diverse and sustainable forest for the future. The benefits for biodiversity depend on the scale and degree of variation in structure and species composition.

Restructuring of planted forests needs to be continued and refined to ensure that biodiversity-enhancing opportunities are taken, in balance with other objectives. We need to include planted woodlands as part of forest habitat network planning. We should build in a wider range of species and age classes and habitat features, such as old growth, dead wood, scrub at edges and treelines; increase the use of Low Impact Silvicultural Systems (LISS), alternative conifers and native species mixtures etc; and also convert some areas to native woodland or manage for other priority habitats and species.

Achray Forest, Loch Ard

Managing sheltered conifer forests to regenerate stands on a small scale and avoid clearfelling could create a very different mix of wildlife with more mature woodland species and less open and edge flora and fauna.



Computer generated aerial perspective of planned woodland structure
(Loch Chon Forest Design Plan, Cowal & Trossachs Forest District, FES, 2000)

We need to encourage more areas to be managed under low intervention regimes, and to promote wider use of techniques like cattle grazing for conserving open and edge habitats. Urban and brownfield planting schemes also should have biodiversity carefully factored in to them especially given their role in providing access to woodlands for people.

- We will promote biodiversity enhancements for planted conifer and mixed woods, through our strategic forest design and biodiversity plans on the national forest estate, and through forest plans and SRDP measures for private woodlands.
- We will promote biodiversity planning according to published best practice in all types of new planting schemes, both on the national forest estate and in private woods supported by measures under the SRDP.
- We will develop proposals for increasing the area of native species on the national forest estate, including native woodlands, mixtures and new hardwood or biomass crops.
- We will develop guidance publications with Forest Research, to show how to enhance biodiversity in conifer plantations and how to build biodiversity into urban woods and brownfield planting schemes.

New woodland and pond, Forth, South Lanarkshire

This wildlife haven was created by a partnership between Forestry Commission Scotland and the Coal Authority to restore former mining land. A reedbed was created to filter toxic minewater outflow and prevent it polluting the Mousewater, a tributary of the Clyde. Other biodiversity features were built in with our help, including native woodland planting, wildflower meadows, and mixtures of native swamp plants. Now reed buntings and moorhens nest in the reedbed and the scheme has attracted a wide range of invertebrate species.

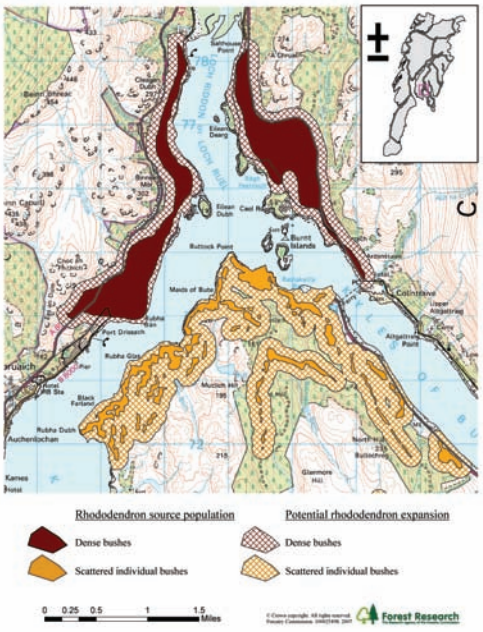
Urban woodland, Drumchapel, Glasgow

Tackle invasive non-native species

We participate in the Scottish working group which co-ordinates action against invasive non–native species. Preventing new threats from becoming established is the ideal, and we work with Forest Research and with Forestry Commission Plant Health to identify and deal with new plant pathogens and pests at an early stage. But there are a few established invasive species that will require partnership action at a landscape scale to deal with them effectively. *Rhododendron ponticum* is currently the most threatening to our woodland biodiversity, although Japanese knotweed and Himalayan balsam are increasing threats in riparian woodlands.

- We will work with partners at national, regional and local level to tackle invasive non-native species affecting woodlands, focussing on the greatest threats, especially in and around designated or other native woods.
- We will lead development of an exemplar regional project for rhododendron control in Argyll and Bute.
- We will contribute on the national forest estate to population control of grey squirrels in key areas to benefit red squirrel populations, in line with the Scottish grey squirrel control strategy.

Rhododendron ponticum is an invasive non-native shrub that has spread widely in woodlands on acid soils, and severely affects biodiversity by shading out other plants and preventing tree regeneration. It is best dealt with by control at a landscape scale to prevent cleared areas from recolonising. We are funding Forest Research to predict the potential for future expansion of rhododendron in Argyll and Bute when disturbance occurs near to existing rhododendron populations. This example map for the Kyles of Bute shows current rhododendron areas and potential expansion zones. We will use this work to help develop a regional control project with partner bodies.



Glen Affric in Invernesshire is an example of the extensive restoration work already undertaken on the national forest estate to revive and expand the Caledonian pinewood.

Lead the development of large-scale forest landscape restoration projects

We need increasingly to work at a landscape scale to build resilient ecosystems in the face of environmental change. We have already developed some large native woodland restoration projects on the national forest estate, for example at Glen Affric (above), and we want to extend this to develop forest landscape restoration projects where natural ecosystem processes can be encouraged from valley floor to the tree line and beyond.

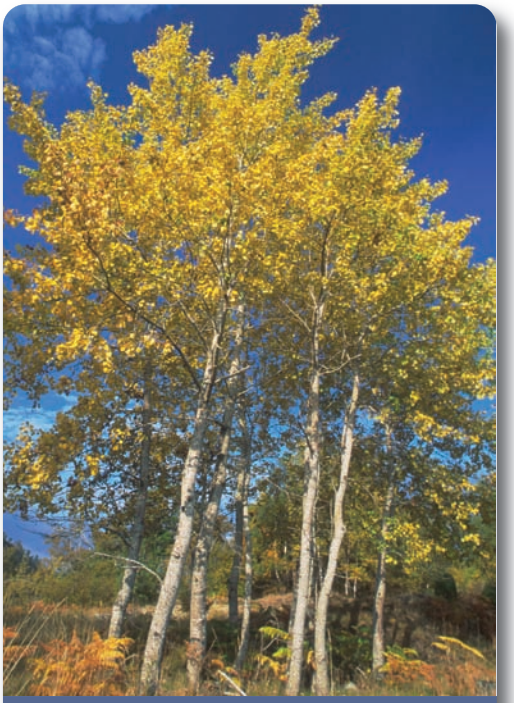
These areas could be a mosaic of wooded and open habitats, not just woodland; they could include planted as well as native woods, and form core areas in future forest habitat networks. Areas of neighbouring ground could also be included, for example areas under long term forest plans and wider SRDP plans. We will explore the potential integration of this concept with catchment planning to meet water quality needs and the 'ecosystem approach' to land management.

- We will work with partners and local stakeholders to develop an exemplar forest landscape restoration project.

Promote supply and use of suitable genotypes for native tree and shrub planting

In 2006 we published guidance on selection of sources for planting stock of native species[5], to ensure that suitably adapted stock is used and semi-natural gene pools sustained. We are keeping the guidance under review to ensure it reflects our growing scientific understanding, e.g. about the effects of climate change. At present the supply of Scottish-sourced plants is still a constraint for some native species, and promoting a greater supply of Scottish-sourced material across the country and from all native species is the key task over the next few years. The national forest estate has a potential long-term role in providing seed sources. The Native Woodland Survey of Scotland will provide much better information on location of possible seed sources.

- We will work with nurseries and collectors to enhance the supply of Scottish sourced planting stock, e.g. by promoting uptake of SRDP measures to register and manage local origin seed stands on private land and developing an equivalent programme for the national forest estate.



We are helping a local project to locate aspen populations in the Cairngorms and identify potential seed sources

3. Increase awareness and public enjoyment of woodland biodiversity

The value of woodlands to people for enjoyment, recreational activities and learning about the environment has been increasingly apparent in recent years. Public opinion surveys have consistently shown that one of the main reasons people visit and value woodlands is for their wildlife. The Scottish Biodiversity Strategy and Scottish Forestry Strategy both emphasise the need for action for enjoyment by people as well as for conservation itself.

Increasing engagement with woodlands is central to our programmes for Woods In and Around Towns (WIAT), Woods for Learning and Woods for Health. Our work within the biodiversity programme will aim to sharpen the focus within these programmes to enhance the wildlife-related benefits.

Volunteers creating a wildlife pond, Drumchapel, Glasgow

[5]www.forestry.gov.uk/forestry/seedsourcesscotland

Help people to enjoy woodland environment and engage more people in woodland conservation (P)

- We will review with partner organisations our needs and capacity to help people enjoy the environmental aspects of woodlands, and identify priorities for the future.
- We will implement our volunteering policy to promote active engagement in voluntary work on the national forest estate, and will include wildlife conservation tasks amongst the activities we offer.
- We will seek further opportunities to develop wildlife-watching on the national forest estate.

Encourage the education sector to make more use of woodlands (P)

- We will review with partner organisations our provision and future priorities for increasing understanding of woodland ecology and conservation within our Woods for Learning programme.
- We will work with the Scottish Biodiversity Strategy partnership to develop broad communications messages and campaigns aimed at promoting understanding of biodiversity amongst the public.

Children pond-dipping with a Forestry Commission Scotland Wildlife Ranger, Peregrine Wildwatch Centre, Aberdeenshire

Watching wildlife

Video cameras in nest boxes at Inverfarigaig, by Loch Ness, allow lots of people to enjoy close up views without disturbing the animals, and also brings in tourists to help the local economy.

There are a range of other popular facilities on the national forest estate where people can watch otters, sea eagles, hen harriers, peregrine falcons, ospreys and red squirrels.

4. Improve knowledge of biodiversity, and ensure it is integrated into decision-making

Forestry Commission Scotland, like all public bodies in Scotland, has a duty under the Nature Conservation (Scotland) Act 2004 to factor biodiversity into all relevant functions. Biodiversity is already incorporated into good forestry practice as demonstrated in the Scottish Forestry Strategy and UK Forestry Standard[6], as well as the UK Woodland Assurance Standard[7]. But we will continue to seek to improve our practices and our knowledge both in our own work on the national forest estate and in carrying out our role of promoting and regulating forestry.

Integrate biodiversity into decision-making, best practice guidance and forestry support measures (P)

- We will help produce and promote new UK Forests and Biodiversity guidelines, and train our staff on biodiversity requirements.
- We will publish advice on the implications of climate change for woodland biodiversity conservation policy, and the role of native woodlands in mitigation and adaptation strategies.
- We will work with SNH, SGRPID, and other stakeholders to develop and review guidance for applicants to target SRDP measures to achieve the best biodiversity outcomes in woodlands.
- We will develop Forest District Biodiversity plans, and enhance the assessment and recording of biodiversity features throughout the national forest estate.
- We will publish a Woodland Grazing Toolkit to advise land managers; it will be based on evaluation of the pilot woodland grazing grant scheme we started in 2005.

Our Woodland Grazing Toolkit will help managers to plan and monitor grazing at sites like this old wood pasture to get a good balance of tree regeneration and conserving field layer plants and animals.

[6]www.forestry.gov.uk/publications
[7]www.ukwas.org.uk

Implement the Native Woodlands Survey of Scotland and National Inventory of Woodlands and Trees to establish a baseline on the extent and composition of woodlands (P)

We are carrying out a major survey of all of Scotland's native woodlands (Native Woodlands Survey of Scotland NWSS) to provide a comprehensive picture of our native woods and their condition for the first time. It will be a firm basis for strategic and management planning, reporting and monitoring of all types of native woodlands. The next National Inventory of Woodlands and Trees (NIWT) will complement this survey by providing a sample-based overview of all of Scotland's woods, which is the basis of indicators of overall changes in woodland biodiversity through time.

- We will complete 2/3 of the fieldwork for the Native Woodland Survey of Scotland by 2011, and publish initial reports with GIS maps on our website.
- We will work with Forest Research and other parts of the Forestry Commission to ensure that the NIWT project meets Scotland's needs, and that fieldwork is underway by 2009.

Surveyor recording data in an upland birchwood. Approximately 700,000 hectares of woodland will need to be visited to find and map all our native and ancient woods, both planted and semi-natural, which are thought to cover about 400, 000 hectares. By March 2008 over 100, 000ha had been surveyed.

Improve the evidence base to secure biodiversity benefits

Substantial programmes of biodiversity research have been undertaken by Forest Research since the mid-1990s, covering both plantation and native woodlands, and including a strong technology-transfer component to make sure knowledge is used. As well as influencing Forest Research programmes, we liaise with other funders in Scottish Government Directorates to identify joint priorities and projects. We may also commission specific projects with partner bodies where this is the best approach.

- We will influence Forestry Commission funded biodiversity research programmes and their linkage to other research programmes, to best meet Scotland's biodiversity priorities.
- We will promote new research on climate change and biodiversity, on methods for converting plantations to native woods, and on landscape-scale indicators for forest restoration.

Enhance systems and guidance for monitoring and recording woodland biodiversity (P)

We are currently leading the development of a set of indicators of woodland biodiversity for reporting trends under the Scottish Forestry Strategy and the Scottish Biodiversity Strategy. As well as these national trend indicators, we want to be able to report on our key actions and outcomes. The national forest estate has a set of performance indicators, including biodiversity.

- We will develop and report annually on a suite of Scottish indicators of woodland biodiversity as part of the Scottish Forestry Strategy and Scottish Biodiversity Strategy.
- We will continue to improve our information systems for reporting on our biodiversity action, especially for designated sites and priority habitats and species.
- We will enhance our guidance on management planning and survey and monitoring methods for woodland biodiversity, and implement the guidance on the national forest estate.

Forestry Commission Scotland and SNH are funding the British Trust for Ornithology to develop the Scottish Woodland Birds Index, an indicator of trends in abundance of breeding birds. Our support will increase woodland sampling effort within the Breeding Birds Survey, and add 8-10 species to the index, including the wood warbler (left) and the great spotted woodpecker (above).

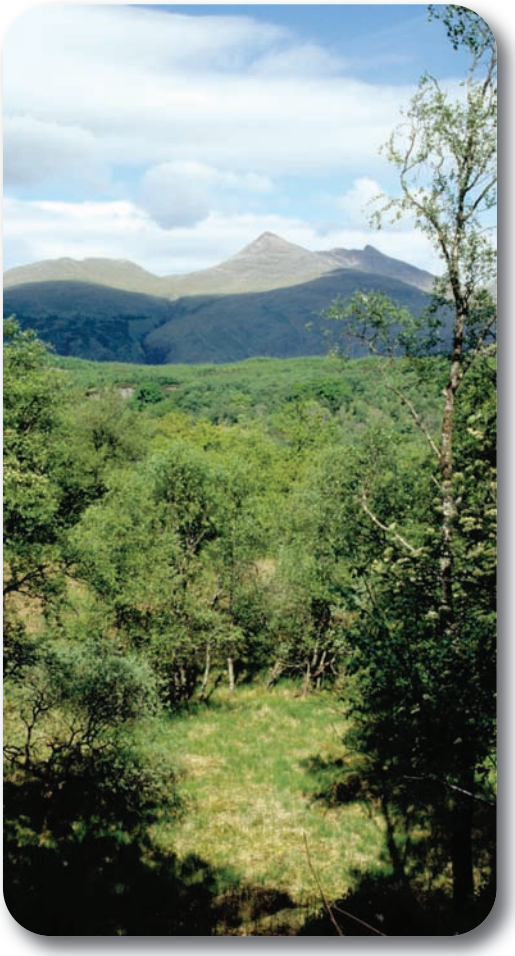
Objective	Activity summary
• Help to halt the loss of biodiversity and reverse previous losses through targeted action for species and habitats	• Lead implementation of the Scottish Programme for Protected Woodland Sites to improve the condition of designated woodland sites • Work with SNH to help prevent or reverse damage caused by woodland to non-woodland designated sites • Lead the delivery of targets for Scotland's native woodland habitats • Promote or carry out management of ancient woodland sites to maintain and enhance their remnant features • Take opportunities to enhance or restore priority open and wood pasture habitats,and publish proposals for the national forest estate • Develop and implement programmes of action for six key species in Scottish woodlands • Work with Scottish Biodiversity Strategy partners to identify how to cater for other priority species within woodland habitats and through wider land use policy • Work with Forest Research to implement and refine the HARPPS decision support system • Enhance recording of information on the distribution of species • Promote and implement best practice for protected species • Work to enhance information, awareness and protection of high biodiversity value woodland in the development planning system
• Broader action for biodiversity at landscape or ecosystem scale	• Work with others to promote opportunities for collaborative deer management under the SRDP • Target our deer management effort on the national forest estate to reduce negative biodiversity impacts from deer • Work with SNH and Forest Research to develop and test decision support tools to help develop forest habitat network plans • Promote woodland expansion and restructuring to strengthen forest habitat networks using forest planning for private and national forest estate woods • Work with stakeholders to embed FHN plans into Indicative Forestry Strategies, planning policy guidance and development plans • Promote biodiversity enhancements for planted conifer and mixed woods • Promote biodiversity planning according to published best practice in all types of new planting schemes • Develop proposals for increasing the area of native species on the national forest estate • Develop guidance to enhance biodiversity in conifer plantations, urban woods and brownfield planting schemes • Work with partners to tackle invasive non-native species affecting woodlands

Objective	Activity summary
• Broader action for biodiversity at landscape or ecosystem scale (continued)	• Develop an exemplar regional project for rhododendron control in Argyll and Bute • Contribute on the national forest estate to population control of grey squirrels in key areas to benefit red squirrel populations • Lead development of an exemplar forest landscape restoration project • Work with nurseries and collectors to enhance the supply of Scottish-sourced planting stock
• Increase awareness and public enjoyment of woodland biodiversity	• Review with partner organisations our needs and capacity to help people enjoy the environmental aspects of woodlands, and identify priorities for the future • Promote active engagement in wildlife conservation tasks as part of voluntary work on the national forest estate • Seek opportunities to develop wildlife watching on the national forest estate • Review with partner organisations our provision for ecology and conservation within our Woods for Learning programme • Help to develop communications messages and campaigns to promote understanding of biodiversity amongst the public
• Improve knowledge of biodiversity, and ensure it is integrated into decision- making	• Help produce and promote new UK Forests and Biodiversity guidelines and train our staff • Publish advice on the implications of climate change for biodiversity policy, and the role of native woodlands in mitigation and adaptation • Help develop guidance for applicants to target SRDP measures to achieve the best biodiversity outcomes in woodlands • Develop Forest District Biodiversity plans, and enhance the assessment and recording of biodiversity features throughout the national forest estate • Publish a Woodland Grazing Toolkit to advise land managers • Complete 2/3 of the fieldwork for the Native Woodlands Survey of Scotland by 2011, and publish initial reports • Work to ensure that the next NIWT project meets Scotland's needs, and that fieldwork is underway by 2009 • Review and influence Forestry Commission funded biodiversity research programmes to meet Scotland's needs • Promote new research on climate change and biodiversity, converting plantations to native woods, and landscape scale indicators • Develop and report a suite of Scottish indicators of woodland biodiversity • Improve information systems for reporting our biodiversity action • Enhance our guidance on management planning and survey and monitoring methods, and implement on the national forest estate

What resources will we need?

These actions will be delivered through the work of our staff on the national forest estate, and the support we can give to private woodland owners through grants under the Scottish Rural Development Plan. We will also work with partner bodies using our forestry development programme budget. We will use the targets and priorities set out in this programme to guide the allocation of resources for biodiversity on the national forest estate.

Because biodiversity conservation is such an integral part of modern multi-purpose woodland management, it is hard to assess the costs of many elements of this programme. We are working to improve our information on costs as part of the programme.



Making sure it works

We will develop a set of evaluation measures which will be closely integrated with the indicators for biodiversity work in the Scottish Forestry Strategy as a whole. Each year an annual progress report will be presented to Forestry Commission Scotland's National Committee and then made publicly available.

We will review the programme annually and revise it 2010/11 to ensure it continues to fit with wider policies and programmes.

Forestry Commission Scotland serves as the forestry directorate of the Scottish Government and is responsible to Scottish Ministers

Contact the address below if you would like to request this document in large print or other formats and for information on language translations.

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