The Peatlands of Caithness & Sutherland

MANAGEMENT STRATEGY 2005 - 2015
## Contents

<table>
<thead>
<tr>
<th>Page</th>
<th>Section</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>Foreword</td>
</tr>
<tr>
<td>4</td>
<td>1. INTRODUCTION</td>
</tr>
<tr>
<td>10</td>
<td>2. WHAT’S SO SPECIAL ABOUT THE PEATLANDS?</td>
</tr>
<tr>
<td>14</td>
<td>3. SO MANY TITLES...</td>
</tr>
<tr>
<td>16</td>
<td>4. MANAGEMENT OF THE OPEN PEATLANDS AND ASSOCIATED LAND</td>
</tr>
<tr>
<td>24</td>
<td>5. MANAGEMENT OF WOODLANDS IN AND AROUND THE PEATLANDS</td>
</tr>
<tr>
<td>34</td>
<td>6. COMMUNITY AND ECONOMIC DEVELOPMENT</td>
</tr>
<tr>
<td>38</td>
<td>7. SPREADING THE MESSAGE ABOUT THE PEATLANDS</td>
</tr>
<tr>
<td>42</td>
<td>8. WHAT HAPPENS NEXT?</td>
</tr>
<tr>
<td>43</td>
<td>Bibliography</td>
</tr>
<tr>
<td>44</td>
<td>Annex 1</td>
</tr>
<tr>
<td></td>
<td>Caithness and Sutherland peatlands SAC and SPA descriptions</td>
</tr>
<tr>
<td>46</td>
<td>Annex 2</td>
</tr>
<tr>
<td></td>
<td>Conservation objectives for Caithness and Sutherland Peatlands SAC and SPA</td>
</tr>
<tr>
<td>47</td>
<td>Acknowledgements</td>
</tr>
<tr>
<td>48</td>
<td>Membership of LIFE Peatlands Project Steering Group</td>
</tr>
<tr>
<td>48</td>
<td>Contact details for LIFE Peatlands Project funding partners</td>
</tr>
<tr>
<td>48</td>
<td>Acronyms and abbreviations</td>
</tr>
</tbody>
</table>
Foreword

As a boy I had the great privilege of spending my summers at Dalnawillan, our family home, deep in what is now called the "Flow Country". Growing up there it was impossible not to absorb its beauty, observe the wildlife, and develop a deep love for this fascinating and unique landscape. Today we know far more about the peatlands and their importance and we continue to learn all the time.

As a land manager I work with others to try to preserve for future generations that which I have been able to enjoy. The importance of the peatlands is now widely recognised and there are many stakeholders and agencies involved. The development of this strategy is therefore both timely and welcome.

The peatlands of Caithness and Sutherland are a special place, a vast and ancient landscape on a scale scarcely matched in the UK. They are a place for wildlife, supporting a wide array of distinctive and often rare plants, birds and animals. But they are also a place for people. For more than half of their existence people have been an integral part of the peatland story. They are a place of work, a place of quiet reflection, of recreation and inspiration, a place that heightens the senses. More recently the importance of other roles, for example as a water source and a carbon store, has also been recognised.

Despite these important qualities, the peatlands have suffered over the last decades from policy shifts, varied standards of stewardship, and uncertainties. This Strategy is the first time that a clear, shared vision for the future has been attempted. It is a vision for a future where land uses complement rather than compete with each other.

The Strategy has been shaped through a process of wide consultation and discussion, and has the support of many organisations and individuals. It is however very much a beginning rather than the last word, as we do not yet have all the answers to many of the issues it raises. My hope is that implementation of the Strategy will continue the way of working that has created it, with more inclusive, co-ordinated planning and action.

There will be opportunities for everyone who lives in, works in, or visits the peatlands to get involved in developing and putting the Strategy into practice. Please take those opportunities, to ensure that the peatlands remain as special for future generations as they are for us.

LORD THURSO MP
Introduction

‘Nowhere else in Britain, and possibly the world, is there such an extensive area of this type of peatland’

Why the peatlands?

The peatlands of Caithness and Sutherland are a special place, of national and international importance. Nowhere else in Britain, and possibly the world, is there such an extensive area of this type of peatland (c 400,000 ha). Together with associated areas of moorland and open water, large areas of the peatlands are designated as Sites of Special Scientific Interest (SSSI). They are recognised to be of national importance for conservation both as a habitat in their own right and because of the diverse range of rare and unusual breeding birds they support. The designated peatlands are also part of the Natura 2000 series of sites (Special Protection Areas and Special Areas of Conservation), which seeks to maintain representative examples of the range of habitats and species across the European Union (EU).

Why a strategy?

Within the Caithness and Sutherland Peatlands Natura 2000 site, the UK government is committed under EU legislation to avoiding the deterioration of qualifying habitats and the habitats of qualifying species, and the disturbance of species. It must also ensure the site’s integrity and maintenance in the future. Outside the designated site is a still bigger area of peatland, which is also of importance for nature conservation and to which the UK government has commitments under the UK Biodiversity Action Plan (see below). There is currently however no clear plan or vision for the area to ensure that these obligations are met. Rather there is a diverse range of regulations, incentives and policies. This strategy, and the process that has led to its production, is the beginning of a more co-ordinated approach.

In some places the legacy of past land use policies for forestry and agriculture is having a detrimental impact on the peatlands, in particular through agricultural drainage, and forest planting on or adjacent to peatland. Where this is the case these impacts now need to be addressed urgently to ensure the future well-being of the peatlands. To support this, the balance between peatlands and woodlands in the area needs to be managed in line with the current national forestry policy objectives. These objectives promote the enhancement of the environment by enriching and extending important woodland areas, whilst integrating with and complementing work to maintain and restore peatland habitats and species.
Although this is primarily a strategy to promote the natural heritage interest of the peatlands, there are many ways in which this can go hand in hand with supporting the needs of local communities and the economy. The strategy recognises that the peatlands are a place where people live and work, and that the support of local communities is key to the survival of the peatlands.

**What area does it cover?**

The starting point for this strategy is all those areas of Caithness and Sutherland with peat soils. Many are aware of the “Flow Country”, the name now often used for the central part of the counties, but in fact peatland is much more extensive, stretching from the west coast of Sutherland across to the far east of Caithness. Much of this peatland supports blanket bog and wet heath vegetation, some of which is designated for its nature conservation interest. Elsewhere agriculture, peat extraction or forestry have significantly altered the character of the peatlands. Within this wide area, the highest priority peatland is that carrying UK and European designations.

The peatlands cannot be considered in isolation however, as they are intimately linked through hydrology, land management, bird and animal movements to a much wider area. The strategy therefore looks at the whole landscape in which the peatlands sit.

**Who is it for and what will it be used for?**

This strategy is for everyone with a direct interest in the peatlands, for example whether running a croft, owning a sporting estate or as a public agency with statutory duties.

Its uses will include the following:

- As a statement of a shared vision and objectives for the peatlands.
- As an action plan which can be used for prioritising work.
- As a reference document for land managers considering future land management options.
- As a source document when policies or plans that affect the area are being prepared.
- As a means of advocating additional funding for the area.

**How has it been prepared?**

The strategy has been prepared by a project officer and overseen by the Steering Group for the LIFE Peatlands Project. A wide range of people and organisations has shaped the content, through invaluable contributions to meetings, workshops and the consultation process. The strategy has been developed in the context of EU policy on biodiversity, and relevant national and local biodiversity and land use policies.

**How to find your way around the strategy**

The strategy starts with a vision, aim, and four overarching objectives. Then comes an introduction to why the peatlands are special and to the various accolades they carry. There are then four topic sections, each related to one of the objectives. Each section describes relevant issues, and a list of actions that are needed to achieve the objective and address the issues. There is inevitably some overlap between the sections as some themes, such as economic development, underlie the whole strategy.
The vision of the strategy

Our vision for the peatlands is one of a revitalised landscape, with extensive sweeps of hill and bog intersected by fertile straths. These straths and coastal strips support a mosaic of productive crofts and farms, rivers, forestry and woodland. Above and between the straths lie the world-renowned peatlands, which, together with their lochs and lochans, support a spectacular assemblage of birds, plants and other wildlife, including internationally important numbers of raptors, waders and waterfowl. The straths, bogs, hills, lochs, rivers, woodlands and forestry are managed together for the wide range of services they provide and interests they support. No one land use dominates to the detriment of others. Rather there is mutual support, with everything underpinned by a healthy environment, at the centre of which is the great peatland of the north. Everyone who lives, works in or visits the area values the peatlands.

Overall aim for the strategy

To enhance and promote the special values of the peatlands of Caithness and Sutherland, through the promotion of sustainable land management, the encouragement of sustainable community and economic development, and through co-ordinated action.

Strategy objectives

OBJECTIVE 1 To promote and carry out land management that benefits nationally and internationally important areas of peatland, and associated habitats and species.

OBJECTIVE 2 To promote and undertake sustainable woodland management, with an appropriate balance between woodlands and peatlands.

OBJECTIVE 3 To encourage community and economic development that is compatible with safeguarding those features that make the peatlands important.

OBJECTIVE 4 To promote greater awareness, understanding and enjoyment of the special wildlife, landscape, historical and cultural values of the peatlands.
Multi-purpose native and exotic coniferous woodlands on mineral soils and shallow peat. Fencing use minimised.

Rivers support healthy fisheries and other wildlife. Water quality good.

Rough ground supports peatland birds and other wildlife.
SOME OF THE KEY ELEMENTS OF THE FUTURE PEATLANDS LANDSCAPE ENVISAGED BY THIS STRATEGY

Heather well managed through good muirburn practice.

Condition of blanket bog and wet heath enhanced through drain blocking, avoidance of muirburn on wet areas and careful use of ATVs.

Sustainable deer and stock numbers, supporting local employment.

In-bye managed to encourage use by peatland birds.
What’s so special about the peatlands?

The habitat

Caithness and Sutherland are home to the largest and most intact area of blanket bog in Europe and possibly the world, with 4% of the world’s resource. Blanket bog develops where a cool wet climate allows the growth of vegetation dominated by Sphagnum bog mosses over extensive areas of sloping ground, hollows and flat areas. Where rainfall levels are high it can develop on slopes up to 30°. It typically overlies deep peat and receives all its nutrients through rainfall. In addition to bog mosses, other widespread plants of blanket bogs are heather, cross-leaved heath, deer grass and cotton grass.

For blanket bog to form, water levels need to be near the surface. Where the ground is not so waterlogged, other habitats occur. Wet heath is found on thinner, better drained peat or where management has caused the peat to dry out. This community has many of the same plants as blanket bog, but the bog mosses are less dominant, cotton grass is absent and heather is more widespread. Dry heath and acid grassland are found on drier ground with mineral soils or occasionally very shallow peat.

To the non-specialist, the diversity of the bogs of Caithness and Sutherland may not be immediately apparent. There is however great variation in form and vegetation, thanks to the differences in climate, geology and underlying landform from west to east and north to south. Water is a critical ingredient of the bogs and a particularly special feature is the patterning of pools often found on level and gently sloping ground. Lochs of all sizes and with a diversity of chemical make-up are abundant throughout the area. The clean waters of the peatlands also feed into many rivers and streams, which sustain internationally important populations of otter, Atlantic salmon and freshwater pearl mussel. These watercourses also support important fisheries and provide water supplies.

The wildlife

Within any given area of bog, the lochs and dubh lochans, hummocks, hollows and smaller pools provide niches for a wide range of plants and invertebrates. The rich insect life in turn helps to support many bird species. The most

The terms peatland and blanket bog may appear to be used interchangeably in this document, but there are some differences between them which can be important. Peatland is a general term for any area with a peat soil, regardless of the vegetation or land use. Blanket bog is one type of peatland. When drained, it will normally still be called blanket bog, although it may no longer be peat-forming, or ‘active’. Peat formation can only take place where waterlogging slows the decomposition of dead material, which then accumulates as peat. Once the key species are no longer present, or only very rare, such as under closed canopy forestry, it ceases to be blanket bog but remains a peatland.
The peatlands are home to a high proportion (48%) of the UK’s breeding population of common scoters, with the UK population having declined by 50% over the last 25 years. This duck nests on moorland around peatland lochs and lochans. Reasons for the duck’s decline have not been established, but may relate to water quality changes in lochs in afforested catchments and changes in predators present around the lochs.
notable breeding birds are red-throated diver, black-throated diver, wigeon, teal, common scoter, golden plover, greenshank, dunlin, wood sandpiper, greylag goose, short-eared owl, golden eagle, hen harrier, merlin and peregrine. Many of the birds are typically northern species that are at the southern limit of their range here (see Annex 1). Peatland mammals include the native red deer, otters and water voles.

As is the case with bird populations elsewhere, the bird numbers on the peatlands are not static. Unfortunately some species such as dunlin, golden plover, snipe and curllew are declining in number. The reasons for this are not fully known, although in the case of golden plover there are indications that forest plantations may be having an impact on the peatland breeding sites. In contrast some species such as greenshank and stonechat are stable or increasing. Marked differences in population change have occurred between the western and the eastern parts of the peatlands, with most species faring better in the west than the east. This may be due to differential changes in land use and/ or climate change.

Whilst some of the peatland birds spend all of the breeding season on the peatlands, others make use of areas either close by or further afield for feeding. Close by, the enclosed pasture or in-bye ground in some parts of the straths provides important feeding for peatland wading birds, particularly the golden plover and dunlin. On the north coast, the calmer sandy bays provide feeding for red throated divers, and greenshank make use of the bays, rivers and areas of saltmarsh. Once the all-important breeding season is over, many of the birds disperse to other parts of Caithness and Sutherland, the UK or beyond.

Climate change-the carbon store

More recently, with growing concerns regarding climate change, the value of peatland as a massive carbon store has begun to be recognised. As peat is largely made up of the remains of plants, which are themselves made of carbon, it locks up large stores of carbon for thousands of years. This carbon would otherwise be released to the atmosphere and contribute to global warming. By contrast...
forests only store carbon for the lifetime of the trees, although the use of timber products can extend this until they too are destroyed or decay. Disturbance of the peat surface, for example through drainage, burning or erosion, allows the peat to break down and carbon dioxide, a "greenhouse gas", is given off to the atmosphere.

Restoration of damaged peatland may reduce carbon dioxide emissions, as every hectare of intact bog is reckoned to store around 250 kg of carbon every year, whereas every cubic metre of peat removed releases 55 kg of carbon. It is possible that global warming could have a negative impact on the extent of peatland. Good land management, and activities such as drain blocking, may be valuable in buffering them against the potential reduction in extent.

The landscape

Aside from its nature conservation interest, the landscape value of the area is much appreciated both nationally and in a Highland context. Much of the landscape of the interior of Sutherland and west Caithness is made up of sweeping moorland, slopes and hills, and flatter areas of peatland. The scale of the landscape is vast in UK terms and much of the area is remote. Although the peatlands have a long history of management, this has been mostly low-intensity grazing of livestock and deer stalking, neither of which has left much evidence in the way of built development.

Such "wild land" is a diminishing resource in Scotland, but is very much part of the regional character of Caithness and Sutherland and the national identity of Scotland. It provides opportunities for people to experience solitude and closeness to nature and attracts people to the area.

The straths of Kildonan, Halladale and Naver, that cut through to the interior of Sutherland and west Caithness, are more populated, often supporting forestry, fragments of native woodland, and farming and crofting activity. By contrast the peatlands in the east of Caithness are surrounded by a more intimate landscape of mixed agriculture and forestry.

Social and economic uses

Despite this strong wild land character, the peatlands support and are shaped by agriculture, sporting management and conservation. These activities provide valuable local employment and income. The peatlands also contribute to the local tourism industry, with many visitors coming to enjoy the wildlife, landscape and archaeology. Use of the area for recreation is at a relatively low intensity, although increasing as it is elsewhere in Scotland.

The archaeology

The activities of the past inhabitants of the peatlands are often visible, and the good state of preservation of many sites makes them an important archive. Examples are important prehistoric sites such as Camster Cairns and the widespread remains of the pre clearances communities, for example along Strath Naver.

The peat itself can also hold important information on the past activities of man and about past environments. Whilst most areas of peat are likely to have formed in response to a wet climate and poor drainage, there is evidence that in some areas peat formation has been influenced by man’s activities. Research on the peat deposit suggests that extensive areas of the Caithness and Sutherland landscape have been treeless for at least the last 4000 years. More research still needs to be done on the relative significance of the influence of man and the changing climate on peat extent.
In January 1988 the then Secretary of State for Scotland supported the protection of a large area (up to 175,000ha) of the peatlands through a substantial expansion of the SSSI network. During the 1990s, following detailed survey and assessment, almost 150,000 hectares of blanket bog and associated habitats were subsequently designated as Sites of Special Scientific Interest (SSSI) under the Wildlife and Countryside Act (1981).

In 1999 all or part of 39 peatland SSSI (145,370 ha), were classified as a Special Protection Area (SPA) under the EU’s Birds Directive (79/409/EEC), on account of the populations of breeding waders, wildfowl and raptors (see Annex 1). The same area was also designated in the same year as a Wetland of International importance, a worldwide accolade under the Ramsar Convention.

Active blanket bog is a priority habitat under the EU’s Habitats Directive (92/43/EEC). An area encompassed by, but slightly smaller than the SPA (143,571 ha), was designated on 17 March 2005 as a Special Area of Conservation (SAC) under this Directive. The SAC qualifies for designation on the basis of various habitats including blanket bog, wet heath, and certain types of lochs and also its otter populations (see Annex 1 for full list). Conservation objectives for the SAC and SPA are given at Annex 2.

Outside the area covered by the European designations is a considerable area of undesignated blanket bog, much of which is still of high nature conservation interest. These areas make an important contribution to the UK Government’s wider responsibilities under the Habitats Directive, Birds Directive, Ramsar Convention and UK Biodiversity Action Plan (UKBAP) and should be managed sympathetically.

The UK Biodiversity Action Plan identifies a series of habitats and species for which priority action is required, as part of the government’s contribution to the International Convention on Biological Diversity. Those present in and around the peatlands include blanket bog, upland heathland, upland birch woodland, water vole and common scoter. Local Biodiversity Action Plans (LBAPs) have recently been prepared for both Caithness and Sutherland and outline how the UK BAP will be implemented at a local level.

Several of the rivers in the peatlands are SACs, namely the Rivers Borgie, Naver and Thurso, on account of the populations of freshwater pearl mussels, Atlantic salmon or otters. Although the main focus of this strategy is the peatlands, there is an intimate link between the management of the peatlands and the health of the rivers.

The Kyle of Tongue is a National Scenic Area (a national landscape designation). A number of other coastal and upland areas have either been identified or are under consideration for local landscape designations through the Local Plan process. Parts of the peatlands are included in areas of search for “wild land”, identified by SNH in its policy statement on ‘Wildness in the Scottish Countryside’.

In 1999 the Caithness and Sutherland peatlands were placed on the UK government’s “tentative list” of sites for nomination as World Heritage Sites (see section 7 below). If nominated, it would be in recognition of the peatlands outstanding natural importance as one on the largest and most intact areas of blanket bog in the world. There are currently only three sites in Scotland with this prestigious title, and of these only one (St Kilda) holds the title in respect of its natural rather than its cultural attributes.
Pool system near Forsinard, Sutherland
Management of the open peatlands and associated land

A high proportion of the peatlands is in excellent condition, but the area has been and is still affected by a number of land use impacts. This section reviews current land management of the open peatlands, summarises the impacts it is having on the nature conservation interest, and then identifies actions to address these impacts and support Objective 1. The proposed actions reflect recent and ongoing shifts in policies and support mechanisms for agriculture, sporting management and the natural heritage, including A Forward Strategy for Scottish Agriculture and the Scottish Biodiversity Strategy. These seek a greater synergy between the environment and our activities.

Agriculture

Away from the more fertile land in the east of Caithness, the majority of the agricultural land in the peatlands is given over to rough grazing, with improved in-by ground being restricted to parts of the coast and the straths. Very little land is under crops, with sheep dominating and only limited cattle numbers. Crofting tenure predominates in the north and west, coexisting with large sporting estates. Recent years have seen a reduction in the number of active crofters, with a few crofters running a large number of holdings in some areas.

In-by ground can play an important role in supporting many of the birds that live on the peatlands. Species making use of farmland close to the peatlands include dunlin, golden plover, snipe, curlew, hen harrier, short-eared owl, merlin, greylag goose and lapwing. Active management is needed to ensure the conditions are right to provide plenty of food and, for some species, nesting sites. Some fields are known to be particularly important for golden plover and dunlin, with birds travelling considerable distances over seemingly similar fields to reach favoured fields to feed, although knowledge of the reasons for this is incomplete. Mechanisms such as machinery sharing rings may be required in future to promote continued management of in-by ground.

Major Common Agricultural Policy reforms came into force on 1 January 2005, with the introduction of the Land Management Contract Menu Scheme.

Objective 1: To promote and carry out land management that benefits nationally and internationally important areas of peatland and associated habitats and species.
Farmers and crofters now claim a Single Farm Payment (SFP) under “Tier one” of the scheme, which is subject to compliance with a number of standards and with the framework of Good Agricultural and Environmental Condition. The SFP is not a headage payment and so many anticipate that there will be a reduction in stock numbers in more marginal areas.

“Tier two” of the new payments is a “Menu Scheme” which is non-competitive and seeks to deliver additional environment, social and economic benefits. A number of the management options are relevant to the peatlands, including “Management of moorland grazing”, although the payments are currently less attractive than SNH’s Peatland Management Scheme (see below). “Tier three” will be launched from 2007 and will involve more detailed management prescriptions, incorporating existing agri-environment schemes, including the Rural Stewardship Scheme.

A limited number of farmers and crofters in the area are in the Rural Stewardship Scheme (RSS), which promotes management to improve the biodiversity and landscape value of a holding. Entry is more difficult however for those holdings with a restricted number of habitats, as is often the case here. Furthermore the scheme does not encompass non-agricultural holdings. In order to address the conservation needs of the peatlands more effectively, the prescriptions available under Tier three will need to be more locally targeted than is currently the case under RSS.

**Deer and Game management**

Much of the open ground in the peatlands is managed for sport, with a significant proportion being in the ownership of a small number of large estates. Deer management is undertaken by individual landowners, and coordination is provided by Deer Management Groups (DMGs). There were dramatic rises in deer numbers from the 1960s to the 1980s, but some estates have made significant efforts to reverse these trends. Densities vary considerably across the area. The traditional deer range was reduced with the widespread afforestation of the 1970s and 1980s and deer movements have been affected.

A recent development is the erection of fences to prevent deer movement onto agricultural and crofting ground. This has happened to the east of Broubster and Shurerry, along Strath Naver and around Strath Halladale. It is not yet known...
whether these fences are likely to increase deer grazing and trampling pressure on the adjacent peatlands, or whether more fencing of this type is likely to be erected elsewhere.

Grouse management occurs in the drier moorland areas in the east, but is restricted in extent. In recent years it has been hampered by reductions in grouse numbers. These may be due to a range of factors including loss of heather ground, land use changes, changes in burning practice, poor weather in June in recent years (which has affected breeding), heather beetle attacks, changes in keeper activity and the presence of a significant tick problem in some areas. There is no evidence from the limited study to date that ticks have a significant effect on other moorland birds, although they frequently carry obvious tick loadings.

Many land managers are concerned about loss of heather cover across the area, as heather provides feeding for both deer and grouse. The causes of this are not known, but contributory factors can be inappropriate grazing and trampling levels by deer and sheep, and poor burning practice. Recent attacks of heather beetle have exacerbated the problem. Current management guidance to combat heather beetle is to continue to carry out muirburn in accordance with the Muirburn Code, as heather that is well managed and not degenerate is more likely to recover fully.

Fisheries management

Atlantic salmon, sea trout and brown trout fisheries make an important contribution to the economy of the area. Atlantic salmon and sea trout populations have declined markedly through most of their ranges over recent decades, due to a combination of factors including higher mortality at sea and changes in land and river management. Populations have however remained healthy over much of north and east Caithness and Sutherland. This is perhaps in part due to the naturally high productivity of the rivers, resulting from the underlying geology. In contrast populations have declined on the west coast, where natural productivity levels of the shorter river systems are lower and marine mortality higher.

The Rivers Borgie, Naver and Thurso are all SACs for nature conservation interests that include Atlantic salmon, and have a regular monitoring programme. A conservation strategy has also been prepared for the River Borgie. SNH is currently undertaking a number of demonstration projects on rivers elsewhere in Scotland, with a view to extending its programme of positive management agreements (Natural Care programme) to cover river management. Obligations under the Water Framework Directive will involve additional river and loch monitoring in the future.

Brown trout are found in lochs and rivers across the area and include the unique Ice Age relict Crocach Trout in lochs above Loch Hope. Brown Trout populations are generally good and reflect the productivity of the waters - high in those areas with limestone featuring in the geology, and low where peat predominates in dubh lochans. Angling pressure remains light to moderate in the most part.

There is an intimate link between management of the peatlands and fisheries. Fish spawning areas and juvenile habitats are often found in the peatlands, miles from any main river or burn, and care needs to be taken to ensure their protection. The quality of
water emanating from the peatlands into the rivers is also a key issue, and potential impacts need to be assessed when planning any landuse change.

**Management for nature conservation**

Until the 1980s the national and international importance of the peatlands was not widely recognised. Since then however, there has been a growth in the management of land specifically for nature conservation. In 1992 SNH introduced its Peatland Management Scheme (PMS) that encourages environmentally friendly land management on both agricultural ground and sporting estates. It is a voluntary scheme open to people managing peatland SSSI in Caithness and Sutherland. Those who participate receive annual payments for the five-year agreement term. Payment levels reflect the extra costs of carrying out best practice management that is additional to the requirements of any agricultural funding.

Uptake and support of the scheme has been good, with about 65% of the SAC being covered by PMS agreements. Some land managers would like to see the scheme put greater emphasis on more positive work such as drain blocking, but resource constraints are an issue. To date the PMS has also not covered the whole gamut of deer related management issues, but relevant ongoing demonstration projects elsewhere in Scotland and the development of best practice guidance will inform any future amendments to cover this.

The RSPB has become very active in the area since the mid 1990s, and is now a major landowner (15,500 ha), with management agreements in place to promote their objectives over a still larger area. They are also a significant employer, with seven full-time staff equivalents involved directly in the peatlands.

Since 1994 two tranches of funding from the EU LIFE Programme have supported a partnership project carrying out a range of management and restoration work, largely on RSPB and Forestry Commission Scotland land, but also to a more limited extent on private ground. Large scale drain blocking is ongoing within the European designated peatland. Targeted tree removal and peatland restoration is also taking place on adjacent areas, with a view to protecting the Natura site features.

Plantlife International, a charity focusing on plant conservation, also has a reserve in the peatlands at Munsary in Caithness, and this too has benefited from drain blocking and other work under the LIFE Project. The Management Group for the reserve is drawn largely from the local community.

**Drains**

Through the 1950s and 1960s, financial incentives were provided for the draining of agricultural land, as part of a post-war policy to promote food production. In reality these drains did little to improve agricultural output in most areas of the peatlands, and are now often detrimental to the nature conservation interest. Drains affect over half of the SAC, with 21% of the area seriously affected.

'...there has been a growth in the management of land specifically for nature conservation’
Typically the water table is lowered for a distance of up to four metres either side of a drain, with other less obvious effects potentially extending further. Gradual slumping of the peat occurs towards the drain and in older drains deep lateral cracking and collapse are observable. The drier conditions allow better heather growth and halt peat formation. This drying out may also reduce the number of invertebrates, which will have a knock on effect on birds.

Where drains were dug on the most gentle of gradients and where maintenance has not taken place, infilling is gradually taking place. By contrast on steeper slopes, the impact of the drains has increased over time, as scouring by rock and debris from further up the hill has increased the size and erosive power of the drains. The silt carried into streams and rivers by these drains may have negative effects on game fisheries. Periods of high rainfall exaggerate the problems of erosion and lead to high flows in adjacent watercourses. In recent years there has been an increasing tendency towards flash floods in rivers locally.

Over the last 15 years some localised drain blocking has been undertaken, largely by the RSPB. Not all are keen on the idea however; some livestock managers have concerns that stock may become attracted to the sweeter growth in blocked drains and then become stuck. Drain blocking may be beneficial to fisheries interests, as it could help to moderate river flows and reduce silt inputs. Ongoing research suggests that drain blocking might also reduce carbon emissions from peatland and so contribute to efforts to abate global warming.

**Muirburn**

Muirburn is a traditional land management practice, carried out to promote new vegetation growth and so increase the amount of feeding available for stock, deer or grouse. It is regulated by legislation and guided by a code of practice known as the Muirburn Code. When practised in accordance with the Muirburn Code, muirburn is compatible with maintaining the nature conservation interest of the peatlands. The Code recommends that blanket bogs should not be burnt, and so the focus of activity should be on the steeper drier heather areas. Extensive less well-controlled burns sometimes encroach on areas of blanket bog, particularly when fires are set in drier or windier conditions using limited manpower. On SSSIs muirburn practice is subject to consultation, and under the PMS a muirburn plan is required. RSS schemes can also cover muirburn activities.

In many areas muirburn is carried out more sporadically than in the past, as numbers of people with available time and knowledge have fallen. This can mean that when burning does take place, there is a higher chance of fires spreading quickly over large areas that have accumulated tall leggy heather and purple moor grass litter. The presence of dry dead heather damaged by heather beetle can also add to the risk of fire spreading.

Some habitats are extremely sensitive to burning, and many of the rare and sensitive plants found in peatlands cannot survive fires. Although the vegetation of an area burnt in the past may superficially appear unchanged, regular or severe burning reduces the variety of plants found and removes some sensitive peat forming species. Erosion can also result from severe burns, and once established on these sensitive peat soils it can be very difficult or impossible to reverse.

**Grazing and trampling**

Due to slow vegetation growth and poor nutritional quality, blanket bogs can only support low densities of grazing animals. Sheep and/or red deer graze most of the designated peatlands, with the impacts of the two being difficult to distinguish.
Over much of the area, grazing levels are considered to be appropriate for maintaining the nature conservation interest, but there are areas with overgrazing and, less frequently, undergrazing. There is also localised evidence of trampling damage, generally where animals are constrained by fencing. Where pools and wetter areas lie adjacent to fences, trampling damage can be more extensive.

Trampling can have a more significant impact than grazing, particularly in the wetter “flows”, as grazing is only attractive in these areas for a short period in the early winter and spring. Trampling can kill off bog mosses and other plants, leaving bare peat, and can be exacerbated by fencing, which can channel deer through narrow areas. Overgrazing and excessive trampling can both lead to erosion, with the slow growth of vegetation and cool wet climate slowing or preventing vegetation recovery.

Deer numbers are counted regularly across the area, but further survey work is required to assess the impact of both deer and sheep on the vegetation. SNH and DCS are currently developing survey methods. Repeat surveys will then be able to detect any changes that may need to be addressed by modifications to management. Close joint working, training and guidance would be beneficial to develop a common understanding of the impacts of management on vegetation, what constitutes good vegetation condition, and how this can be achieved to support all interests.

Vehicle use

All-terrain vehicles (ATVs) and quad bikes are now seen as an essential tool for both
sporting and agricultural work. The cumulative effects of the last forty years of use are however now evident in some places. When used in softer and wetter areas of peatland they can cause significant damage to the fragile plant communities, with recovery either being very slow or bare ground becoming eroded. Use of vehicles can be controlled on SSSI, and some practical work to minimise damage can be funded through PMS agreements.

It is likely that in the future more constructed tracks will be proposed as informal ATV routes become more damaged by greater use. It is also possible that fishing activity may increase in some areas and may result in the desire for increased vehicle use. Whilst constructed tracks can limit the incremental spread of damage, they have their own direct and indirect effects on the vegetation and on water movement. In terms of vehicle technology, ATVs with front wheel steering are likely to cause less damage than those that rely on skid steering.

**Peat cutting**

No commercial peat cutting takes place within the Natura site, and elsewhere in the peatlands there is just one site where there is ongoing extraction. No future expansion is anticipated. Domestic peat cutting still takes place, but is much less widespread than it used to be. Where it still occurs, it has become increasingly mechanised. On designated peatland it is subject to discussion under both SSSI procedures and the PMS to minimise any impacts.

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**Summary of key open peatland management issues that may affect the nature conservation interest of the peatlands**

- To be suitable for peatland waders, in-bye fields in key areas need to be actively managed.
- RSS is a positive tool, but uptake here is low, perhaps because entry is more difficult for those holdings with a restricted number of habitats, as is often the case here.
- New fences to restrict deer movements may affect grazing and trampling levels of adjacent areas.
- There is concern that heather cover has reduced in the area.
- The Peatland Management Scheme is valuable and should be continued, but could be more proactive in addressing positive management works.
- Drains are often detrimental to the nature conservation interest and may impact on fisheries interests and river flow rates.
- Poor muirburn practice can damage sensitive peatland habitats.
- More guidance and training are needed on vegetation assessment and what constitutes good condition.
- Regular monitoring is needed to identify any changes in vegetation and their causes.
- ATVs and quad bikes can cause damage to sensitive peatland habitats.
**OBJECTIVE 1:** To promote and carry out land management that benefits nationally and internationally important areas of peatland and associated habitats and species.

<table>
<thead>
<tr>
<th>ACTION REQUIRED TO ACHIEVE OBJECTIVE 1 AND ADDRESS ISSUES RELATING TO MANAGEMENT OF OPEN PEATLAND</th>
<th>PARTNERS</th>
<th>PRIORITY</th>
<th>TIMESCALE</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.1 Promote changes to Rural Stewardship Scheme to ensure applicability and availability in the peatlands and associated habitats including inbye.</td>
<td>SEERAD*, CC, SNH, SAC, RSPB, SEPA, Land management interest groups</td>
<td>High</td>
<td>Short</td>
</tr>
<tr>
<td>1.2 Promote easily accessible land use support systems through ongoing CAP reform that maximise the opportunities for the sustainable management of the peatlands.</td>
<td>SEERAD, CC, SNH, SAC, RSPB, SEPA, Land management interest groups</td>
<td>High</td>
<td>Ongoing</td>
</tr>
<tr>
<td>1.3 Promote continued management of in-byeland.</td>
<td>Land managers, SNH, RSPB, CC, SEERAD, SAC</td>
<td>High</td>
<td>Short</td>
</tr>
<tr>
<td>1.4 Seek to reduce and reverse trends of loss of heather from areas of heath and bog.</td>
<td>Land managers, Land management interest groups, SEERAD, SNH</td>
<td>Medium</td>
<td>Medium</td>
</tr>
<tr>
<td>1.5 Promote continued funding for and development of the Peatland Management Scheme.</td>
<td>SNH*</td>
<td>High</td>
<td>Short</td>
</tr>
<tr>
<td>1.6 Facilitate the blocking of agricultural drains and consider the introduction of additional funding for this through PMS or RSS.</td>
<td>SEERAD, SNH*</td>
<td>Medium</td>
<td>Medium</td>
</tr>
<tr>
<td>1.7 Promote best practice and training in the sustainable management of the peatlands, including on muirburn and habitat assessment e.g. through RSS, PMS, DMGs, North Highland College.</td>
<td>SEERAD, SNH, SAC, CC, DCS, North Highland College, RSPB, Fire Brigade, Northern Constabulary, Land management interest groups, SEPA</td>
<td>Low</td>
<td>Ongoing</td>
</tr>
<tr>
<td>1.8 Maintain deer and stock numbers at levels that sustain the natural heritage interest of the peatlands, and are compatible with other land uses.</td>
<td>Land managers, DCS, SEERAD, SNH</td>
<td>High</td>
<td>Short</td>
</tr>
<tr>
<td>1.9 Undertake regular assessment of deer and sheep numbers and the habitat to identify any impacts that might be occurring.</td>
<td>DCS, SNH, SEERAD, Land managers, North Highland College</td>
<td>High</td>
<td>Ongoing</td>
</tr>
<tr>
<td>1.10 Support Deer Management Groups as a forum for collaborative deer management, with a view to balancing private and public objectives in relation to deer.</td>
<td>Land managers, DCS, FCS, RSPB, SNH, SEERAD</td>
<td>High</td>
<td>Ongoing</td>
</tr>
<tr>
<td>1.11 Embed habitat impact assessments into Deer Management Plans and use to inform cull targets.</td>
<td>Land managers, DCS, SNH, Land management interest groups</td>
<td>High</td>
<td>Short</td>
</tr>
<tr>
<td>1.12 Promote DCS Best Practice Guidance and consider implementation of accreditation scheme.</td>
<td>DCS*, SNH, RSPB</td>
<td>High</td>
<td>Ongoing</td>
</tr>
<tr>
<td>1.13 Investigate management and engineering solutions to impacts of ATVs on peatland</td>
<td>SEERAD, SNH, DCS, SEPA</td>
<td>Low</td>
<td>Medium</td>
</tr>
<tr>
<td>1.14 Facilitate implementation of Local Biodiversity Action Plans for Caithness and Sutherland and the Scottish Biodiversity Strategy.</td>
<td>THC*, FCS, SNH, RSPB, CC, Land managers, Community groups and interest groups, CASE, SEPA, Scottish Water</td>
<td>Medium</td>
<td>Short-Medium</td>
</tr>
</tbody>
</table>

**TABLE 1**
The overall aim of this strategy is to maintain and enhance the special values of the peatlands. This cannot be done effectively without consideration of the management of forests and woodlands in and around the peatlands. Since the early 1990s more than 14,000 hectares of new native forest have been established across Caithness and Sutherland, benefiting both biodiversity and landscape. By contrast most of the trees planted in the 1970s and 1980s were exotic conifers.

In some cases, where coniferous trees were planted on or near peat, there has been a detrimental impact on underlying and adjacent blanket bog and associated habitats and species. In considering the future of these areas of forest, there is an opportunity to restore areas of blanket bog and associated habitats, helping to achieve a better balance between woodland and peatlands. In seeking this balance, there is also an opportunity to review the scope for new woodlands in the area, to benefit biodiversity, local economies and landscape. This section of the strategy looks at issues in relation to woodlands and identifies actions to support Objective 2.
Objective 2: To promote and undertake sustainable woodland management, with an appropriate balance between woodlands and peatlands.

Native woodlands

Mature broadleaved woodlands are now scarce around the peatlands, being mostly restricted to a few of the more sheltered straths and gorges. The Scottish Semi-natural Woodland Inventory identifies 1372 ha of semi-natural woodland in Caithness and Sutherland, with the majority of this being around Assynt and the Kyle of Sutherland. It is likely that broadleaved woods were once more extensive, particularly in the south and west, but clearance by man, burning and grazing have reduced their extent significantly. Those fragments that remain tend to be heavily grazed both by domestic stock and deer. This not only restricts regeneration, but may also reduce the diversity of species that are present.

Birch is the dominant tree species, with other key species including rowan, alder, aspen, grey willow, eared willow, and bird cherry. Hazel is locally common where conditions are slightly richer, and goat willow and wych elm occur locally in gorges, again favoured by slightly richer conditions. Oak reaches its northern limit in the southern part of the peatlands, occurring only infrequently on better mineral soils. The nearest extensive pinewoods are at Amat, but Caledonian pine would have been a significant component of many woodlands in the past in the southern part of Sutherland, decreasing northwards as conditions became less favourable. Juniper occurs locally, mainly in gorges but also on some exposed hillsides. Dwarf birch (Betula nana) also deserves a mention, as this nationally scarce plant occurs in the peatlands, albeit with a restricted range.

The plant and animal species supported by the native woodlands in this area are considered to be typical of birch dominated woodlands, with plant species being more diverse in gorges or ledges out of the reach of grazing animals. The species present are those that survive well in woodland edge conditions, rather than those that require large blocks of unbroken woodland. The more western woodlands have richer, more oceanic moss, liverwort and fern communities.

In the north of Scandinavia, there is commonly a transitional zone of tree growth of decreasing size on the edge of bogs. It is used by a number of peatland birds that also occur or have occurred in Caithness and Sutherland, namely wood sandpiper, ruff, Temminck’s stint and red-necked phalarope. Although there are a few places in Caithness and Sutherland where native woodlands border the edge of bogs, there is no transitional woodland of this type. Research could determine whether this habitat ever existed here and if so, its extent. This would help with planning future management.

The forestry resource

A significant proportion of the forests in Caithness and Sutherland form part of the National Forest Estate managed by Forest Enterprise Scotland. These forests are managed within the framework of the UK Woodland Assurance Scheme with the aim of providing a balance of
environmental, economic and social benefits. Many of the forests are still relatively young but as they mature opportunities are being sought to develop a more diverse structure and to introduce a wider range of tree species. This restructuring also provides opportunities to ensure peatland interests are protected and native woodland habitats enhanced and extended.

In many of the privately owned plantations however the focus is on the production of commercial timber. The nature conservation value of these woodlands is currently limited in most cases, but there is the opportunity over time to improve this through restructuring. The presence of forest blocks in open landscapes may benefit small numbers of some rare bird species such as merlin and hen harrier, and also more common woodland species.

The quality of the timber being produced varies with species, provenance and site conditions, with those plantations on shallower peats and mineral soil often producing the best timber. Windthrow is also an issue in more exposed areas, with the majority of plantations being managed on a clearfell system, to avoid the risk of windthrow. With appropriate design and in some cases early thinnings, the impact of windthrow can be reduced.

Forestry now competes in a global market and decisions about harvesting are affected by timber prices and the costs of harvesting and transportation. Haulage costs are often the key factor in determining viability, along with timber quality. Extraction by road is restricted in many areas to agreed routes, set by bridge weight restrictions and the poor condition of some single-track roads. The railway is seen as providing a potential alternative in the future and loading facilities have already been developed at Kinbrace. Similar facilities are currently being considered for the Georgemas Junction in Caithness.

Haulage costs can be significantly reduced where local markets are available. Wood as a fuel is now recognised as an important source of renewable energy and government agencies and the EU are encouraging the development of woodfuel “clusters” (users and suppliers) in various parts of Scotland. In addition to local community interest in Caithness and Sutherland, a woodfuel district heating scheme is currently under consideration for Wick, as is the development of a “cluster” of businesses using locally sourced wood as fuel. Although woodfuel is a low value product, it does provide the additional potential benefits of local employment, the opportunity to thin woodlands at an early stage, a use for “waste” timber, and an end use for smaller timber felled for peatbog restoration that is currently being left on site.

As the forests mature and new local markets for timber develop, the opportunities for enhancing their economic, social and environmental value are increasing. This, combined with the creation of new well planned forests, integrated with native woodland, peatland and other land use interests, will form a key part of the sustainable management of trees throughout Caithness and Sutherland.

In locations where extraction is unlikely to bring an economic return, through poor quality, distance from markets or difficulty of extraction, some owners now anticipate that replanting with similar species will not be worthwhile or appropriate. Replacement with native species is already under consideration in some areas, but there are difficulties with financing clearance of the existing crop. Whilst Christmas tree growing was once a profitable option in the area, the margins for this have now shrunk.

In such a rural area, forestry represents a significant employer. The jobs provided in forest management (including forest rangers), timber extraction and haulage, particularly in the more mature Forest...
‘Restoration of afforested areas to bog and wet heath habitat has already been happening in Caithness and Sutherland as part of the LIFE Peatlands Project.’

Enterprise woodlands, can have a big impact in an area with such low population numbers and limited employment opportunities. Over 30 people have been involved in contract forestry work for the current EU LIFE Peatlands Project.

A considerable investment has been made in forest recreation and interpretation in the area, by Forest Enterprise in particular, and this will have knock-on benefits for employment in tourism. Private forest owners have established recreational facilities throughout Caithness and Sutherland, including the opening up of a continuous horse, cycle and walking route through the peatland forests from Loch More to Forsinain, with a circular route from Loch More via Altnabreac.

There may also be future employment opportunities from non-timber forest products, such as berries and fungi. Trial areas for berry growing already exist at Bonar Bridge, Borgie and Helmsdale, under the auspices of the Highland Berry Growers Group.

The impacts of forests on the peatlands

In the 1970s and 1980s some plantations were established on peatland of similar quality to that subsequently designated as SSSI, leading to a direct loss of blanket bog and associated habitats. In some cases forestry is now having a detrimental impact not only on underlying but also adjacent peatland habitat. An audit of damage and threat to the Natura site has identified forestry as one of the most significant activities having a detrimental impact on the Natura site.

Where forests are on peat, the water level in the peat is lowered through drainage works and through the taking up and interception of water by growing trees. This can cause the peat to dry out and crack. Research has also identified hydrological impacts on peatland up to 50m beyond the edge of a forest, including changes in surface water flow and surface shape. Road building and the use of fertilisers and herbicides can also affect both underlying and adjacent peatland.

Areas of peatland available for breeding peatland birds may also be reduced by forestry. Studies have shown reduced use of peatland near to forest edges by species including golden plover, curlew and red grouse. This may be due to increased predation, avoidance by birds of tall structures (visual avoidance), and changes to habitat management near forests (e.g. reduced burning leading to taller vegetation). Research is ongoing, but suggests that impacts may extend up to 1000m in some circumstances. There is incomplete knowledge of predator numbers and impact.

Seeding of non-native tree species onto bogs from adjacent forests may be an issue in the longer term. Seeds can be carried up to about 100m, although birch seed can carry further in certain climatic conditions. Climate change may exacerbate this impact, if bogs become drier in the summer as some models predict.

Since 1988 forestry activity has been governed by the “Forest and Water Guidelines” and adherence to these has
avoided a number of the problems associated with earlier forestry practices. Afforestation proposals undergo wide consultation and are also now appraised under the Environmental Impact Assessment (Forestry) (Scotland) Regulations 1999 before the Forestry Commission Scotland (FCS) determine whether to give approval.

The future management of forests in Caithness and Sutherland

There will be cases where replanting of forestry will not be required by FCS and where restoration to bog or wet heath will be appropriate. Incentives will be considered to promote restoration, which may involve early felling. The highest priority cases will be those areas of forestry which are affecting the interests of the Natura site (see Annex 1). Where trees are causing or likely to cause deterioration of the interests of the Natura site (SPA/ SAC) or of the peatland interest of SSSI not within the Natura site, replanting will not be required after felling. In most cases the Natura interests are contained within the boundary of the Natura site, but in a few cases species may also be dependent on ground outside the boundary. FCS will take this into account in any assessment. This is relevant on both private and public land and FCS may request an Environment Impact Assessment to consider the impacts of deforestation.

Outside the designated peatlands is a considerable area of undesignated peatland, much of which is still of high nature conservation interest. Under the UK Biodiversity Action Plan, the Blanket Bog Habitat Action Plan seeks to introduce management regimes to restore 75% of blanket bog which is currently degraded, such that it is in or approaching favourable condition by 2015. This target will not be reached unless both designated and undesignated blanket bog is restored, and decisions on forestry affecting undesignated peatland will need to take this into account.

Restoration of afforested areas to blanket bog and wet heath habitats

Restoration of afforested areas to bog and wet heath habitat has already been happening in Caithness and Sutherland as part of the LIFE Peatlands Project. The first phase of this work ran from 1994-98 when a number of techniques were tested on a range of high priority sites. The trials clearly demonstrated the restorability of such areas, showing the recovery of key peatland species within 2-3 years of felling. The second phase of the Project (from 2001 to 2006) is carrying out much more extensive restoration, with a target of 2100 ha by 2006. To date, approximately 1600 ha have been restored.

The time taken for deforested sites to recover to blanket bog or wet heath vegetation will vary greatly, depending on site history, site conditions and techniques used. The longer that a tree crop has been on the land, the more likely that more of the original bog vegetation will have been lost and that the peat will have been more damaged, such that recovery will take longer. Costs of restoration also vary depending on the age of the trees, with costs rising steeply as the trees mature and so become more difficult to handle. In priority areas there is therefore an urgent need to undertake restoration in the near future, so as to reduce both recovery times and costs.

Site characteristics that are likely to indicate and promote a more speedy
recovery include the presence of a shallow water table (within 10 cm in winter), the presence of pools and damp hollows, and a drainage layout favourable to rewetting. Flatter areas or with a slope of less than 1° are also more likely to recover more quickly as restoration of water levels is likely to be easier. Where the peat has already dried out to the extent that it is cracking, it will be much more difficult to promote recovery. Over time, cracks in the peat form an underground network. This can hinder attempts to rewet the surface, as the network of cracks can carry water around dams that are put in to block forestry drains.

Where the tree canopy closure is incomplete, there is more likely to be remnant bog vegetation surviving. This will ensure a faster recovery as the surviving bog vegetation can spread out once the conditions become favourable for it, as drains are blocked and the water level rises. It is not anticipated that any seeding of plants will be required, as the wetter conditions following restoration will favour peatland plants and suppress other species.

The LIFE Peatlands Project has looked at various techniques of tree felling and drain blocking, and established that bog recovery is quicker where tree trunks are cut up and then laid into the forestry ditches. This helps to block the ditches and so slows any water flow, reducing the risk of erosion and runoff. It also provides a structure to knit the vegetation together. Whilst ideally trees would be removed from site and put to some end use, this is currently prohibitively expensive. The creation of local markets for timber may change this position in the future. Removal of trees would have to be done in a way that minimised damage to the bog surface.

There are potential water quality implications from the clearance of significant areas of forestry. The key issue is phosphate input to water courses, but this is only likely to become a problem if more than 20% of a catchment is deforested in any given 12 month period.

**Forests and deer**

Forests can have an impact on deer in the peatlands as they reduce the deer range, and forest fences restrict and channel deer movements. This in turn can lead to higher densities of deer on the peatlands, cause localised tracking and erosion along fence lines. Where fences are not maintained the forests also provide shelter, thus enabling deer condition to improve and numbers of both red and roe deer to increase. In some areas deer are causing significant damage to broadleaved trees.

There is incomplete information on forest deer populations, but densities vary greatly between different areas. It is also not yet known whether the rise in forest deer populations is likely to have implications for the condition of the surrounding peatlands. With the downturn in the economic outlook for forestry, some forest blocks have now been purchased by owners whose primary objective is to manage the deer for sport.

Deer numbers which may be appropriate for management of the open peatlands may be higher than those that would enable the development of more natural woodlands. Determining and then maintaining populations to achieve these varying objectives is a significant challenge still to be addressed.
Planning for new woodlands

There would be nature conservation and potentially socio-economic benefits from improving the condition of the existing native woodlands and where possible expanding them. Benefits could include recreational use, landscape enhancement, timber for local use and stock shelter once any woodland is fully established. Given the current low level of native woodland cover however, it is also a priority to encourage new native woodlands, preferably by natural regeneration, or by planting where that is unlikely to be successful. Changes in incentives in recent years have already encouraged a significant number of native woodland schemes in the area on mineral soil or shallow peat. Some of these have been carried out by crofters taking advantage of changes in legislation. The North Highland Forest Trust is a useful support organisation for this work.

There may also be areas on mineral ground or shallow peat where it is appropriate to plant new areas of non-native woodlands, particularly where these bring multiple benefits such as timber for local use and habitat network links (see below). The establishment of both native and non-native woodland on appropriate mineral and shallow peat can also bring the benefit of locking up carbon, and so support efforts to slow climate change.

The nature conservation value of new woodland can vary depending both on the species used and on its location. Where new woodlands (either natives or non-natives) are positioned near existing woodlands, as part of a network, it is easier for species to colonise the new woods from the existing woodland habitat. The new woods can also become a stepping-stone, a link in a woodland habitat network that allows animals and plants to move according to their needs.

To be part of a network, woods do not need to be continuous but some species will find it easier to move between woods than others, depending on both the distances and also on the type of land to be crossed. Riparian or riverside woodlands are of particular value in a network, as rivers form natural corridors. There are also additional benefits to water quality, flow regulation, and in some case to fisheries, from riverside planting.

Consideration should also be given to promoting some areas of native scrub or more open woodland of appropriate species on the edge of peatlands on mineral or shallow peat. The potential impact on peatland interests would need to be assessed.

Deer impacts are generally too high over most of the area to allow any new planting or regeneration schemes without fencing. Deer fencing adds considerably to the costs and brings other disadvantages such as landscape impacts, tracking by deer and constraints on access. It can also lead to a less natural woodland structure, as grazing animals are part of a natural woodland system. Deer fences need to be considered in the light of the Joint agency statement and guidance on deer fencing. Any woodland proposals should take into account the existing use of an area by deer (for example for wintering) and plan for future deer management.

Map based computer-modelling can help plan where new woodland might best contribute to a woodland habitat network. Modelling has to take into account the nature of woodlands in an area and the species they support.
Native woodlands are scarce and often heavily grazed.

No transitional zone of native scrub/open woodland is present on edge of bogs.

In some cases forestry is having a detrimental impact on underlying and adjacent peatland, and restructuring and clearance may be needed.

The balance between woodlands and peatlands needs to be carefully planned and managed.

The restructuring of existing forests, along with appropriate enhancement and extension of native woodland areas, has the potential to contribute significantly to the environmental, economic and social value of the peatlands.

The development of local markets for timber would benefit the local economy.

Forest deer are increasing in numbers and may have impacts on woodlands and peatlands.

Guidelines for new woodlands (native and non-native species)

- Woodland establishment should be on mineral ground or shallow peat.
- Where planting is proposed near peatland, consider any possible impacts on peatland interest, for example through harbouring of predators and through peatland birds avoiding nesting near woodland edge. More open woodland with a higher proportion of scrub species is likely to be more appropriate.
- In-bye ground which is used by feeding peatland waders should be avoided.
- Prioritise watercourse planting, in consultation with fisheries interests.
- Prioritise establishment of new native woodlands close to existing native woodland.
- Consider deer movements and use of the area.
- For native woodlands birch will be the dominant species. Other appropriate species are rowan, alder, aspen, grey willow, eared willow, bird cherry and in some areas Scots pine. Hazel, goat willow and wych elm will be suitable in slightly richer conditions. Juniper may also be appropriate in small amounts.
- Locate woodland so as to maximise the habitat network benefits.
- Prioritise woodlands that can bring multiple benefits to the area.
- Consider impacts on the NSA, any local landscape designations, the settings of designated cultural and historic sites, wild land search area, landscape character.
- Consider opportunities to improve public access.
**OBJECTIVE 2:** To promote and undertake sustainable woodland management, with an appropriate balance between woodlands and peatlands.

<table>
<thead>
<tr>
<th>ACTION REQUIRED TO ACHIEVE OBJECTIVE 2 AND ADDRESS ISSUES RELATING TO FORESTS AND WOODLANDS IN AND AROUND PEATLANDS</th>
<th>PARTNERS</th>
<th>PRIORITY</th>
<th>TIMESCALE</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.1 Promote incentives that support the sustainable management of woodlands and the expansion of woodland habitat networks, including riparian woodlands.</td>
<td>FCS*, SNH, RSPB, THC, SEPA, CC</td>
<td>High</td>
<td>Short</td>
</tr>
<tr>
<td>2.2 Provide clear guidance on the location and type of woodland that might be appropriate in and around the peatlands.</td>
<td>FCS*, SNH, SEERAD, THC, RSPB</td>
<td>High</td>
<td>Short</td>
</tr>
<tr>
<td>2.3 Develop guidelines on appropriate forestry restructuring and clearance, and develop incentives and mechanisms to enable these to be implemented.</td>
<td>FCS*, SNH, THC, RSPB</td>
<td>High</td>
<td>Short</td>
</tr>
<tr>
<td>2.4 Maximise the local economic and community benefits from any forest restructuring or clearance work.</td>
<td>FCS, THC, RSPB, CASE, NHFT, CC</td>
<td>High</td>
<td>Short</td>
</tr>
<tr>
<td>2.5 Support the preparation of Forest Plans for individual land ownerships</td>
<td>FCS*</td>
<td>Medium</td>
<td>Medium</td>
</tr>
<tr>
<td>2.6 Determine the appropriateness of promoting scrub/ open woodland at the edge of blanket bog.</td>
<td>FCS, SNH, SEERAD, RSPB</td>
<td>Medium</td>
<td>Medium</td>
</tr>
<tr>
<td>2.7 Develop modelling to identify areas where creation of new woodland would have maximum natural heritage benefits.</td>
<td>FCS*, SNH, THC, SEERAD, RSPB</td>
<td>High</td>
<td>Short</td>
</tr>
<tr>
<td>2.8 Promote the development of wood fuel and other local timber markets.</td>
<td>FCS, THC, CASE, NHFT</td>
<td>High</td>
<td>Short</td>
</tr>
<tr>
<td>2.9 Develop economic methods of extracting trees off peat bogs whilst minimising damage to bogs.</td>
<td>FCS, CASE, RSPB, NHFT</td>
<td>High</td>
<td>Short</td>
</tr>
<tr>
<td>2.10 Ensure forest and woodland planning and design take account of deer and future deer management.</td>
<td>DCS, FCS, THC</td>
<td>High</td>
<td>Ongoing</td>
</tr>
<tr>
<td>2.11 Undertake bird modelling to assist prioritisation of clearance of forestry areas not currently affecting the Natura site but where restoration to bog should be a priority.</td>
<td>RSPB*, SNH</td>
<td>Medium</td>
<td>Medium</td>
</tr>
<tr>
<td>2.12 Promote and implement national guidance on fencing for deer management.</td>
<td>Land managers, Land management interest groups, DCS, SEERAD, FCS, SNH</td>
<td>High</td>
<td>Ongoing</td>
</tr>
<tr>
<td>2.13 Encourage co-operation between deer and forestry managers to address forest deer issues.</td>
<td>Land managers, Land management interest groups, DCS*, FCS, SNH</td>
<td>Medium</td>
<td>Short</td>
</tr>
</tbody>
</table>

**TABLE 2**
The future long-term health of the peatlands depends very much on decisions that are made regarding community and economic development in the area. It is likely that to be successful, the future economy of the area will be a mixed one, with less of an emphasis on commercial timber production than has been the case in the past. New opportunities for estates and communities are likely to come through new native woodlands, management of existing woodlands for more mixed objectives including wood fuel, management for nature conservation, and "green" or wildlife tourism ventures. Small-scale renewable energy schemes may be appropriate in some places where this is compatible with other interests.

The following section looks at development issues that already impact on the peatlands or may do so in the future and identifies actions to address Objective 3. Some aspects of socio-economic development are dealt with in other parts of the strategy, in particular woodlands (section 5), and tourism and interpretation (section 7).

Objective 3:
To encourage community and economic development that is compatible with safeguarding those features that make the peatlands important.

Infrastructure and other economic developments

Developments likely to occur in the area are infrastructure projects such as renewable energy schemes (see below), road and track repair or creation, water supply provision and house building. Community and economic benefits will need to be assessed against potential environmental impacts, including impacts on the peatlands. Potential impacts for wind turbines are described below, and the principles of many of these would also apply to other infrastructure developments, albeit the scale will vary. Major developments located in peatland areas should also demonstrate that mitigation measures are in place to minimise the potential
impact on the carbon balance and so on global warming. This includes minimising peat removal, drying and exposure.

There may be scope in the future to develop the economic benefits arising from the peatlands, through additional marketing or branding of products from the area. This could have the dual benefit of bringing additional income and also raising the profile of the area. Other possible future economic developments are covered in sections 5 and 7.

**Renewable Energy Development**

In 1997 at the Kyoto summit meeting, the UK government signed up to targets for reductions in the emissions of the greenhouse gases that contribute to global warming. The promotion of renewable energy technologies is one element of the government’s programme to meet these targets, and is supported by financial incentives.

Along with other areas with consistently high average wind speeds, open landscapes and relatively low population densities, Caithness and Sutherland have seen a rapid rise in interest from would-be developers encouraged by these incentives; particularly those looking at onshore wind technologies. There are currently over 40 wind turbine schemes proposed in Caithness and Sutherland. At present there is no national strategic framework to guide potential developers, although the Highland Council is now embarking on a regional strategy.

The development of renewable energy generation capacity is an important part of efforts to tackle global warming, but environmental standards should also be maintained to ensure that environmental losses do not outweigh gains. With adequate planning it should be possible to enable some schemes to progress in appropriate locations and at the correct scale. Smaller scale schemes that bring community benefit are likely to be more appropriate in this area. Highland and Islands Enterprise’s Community Energy Company has been set up to promote such schemes.

Particular issues in relation to the peatlands include the possible loss of habitats and wildlife. The impact on birds will depend on the numbers and species of birds present, their flight patterns in relation to the wind turbines, the number, size and characteristics of the wind turbines, and ancillary developments including transmission lines. Potential consequences include bird collision and disturbance.

Other issues are the potential damage to peat soils, bog structure, hydrological integrity, creation of access tracks into the peatlands, associated changes in land use, grazing, and disturbance to deer in the construction phase. Consideration is also needed of the impact on open landscapes, where wind turbines can be very visible, the potential attrition of the wild land resource and the cumulative impact of successive developments. Building on peat in the uplands, on a
slope or where previously disturbed by forestry are all very technically demanding situations, which can potentially cause difficulties.

Whilst proposals may not themselves be located on peatland, they may impact on the flight lines of peatland birds and the feeding range of eagles. Many of the breeding birds fly daily to the north coast to feed, passing over large areas of undesignated land. Migration routes also take birds across undesignated land. Information on bird flight lines is currently incomplete. There is a risk that developers will seek to fit proposals between the designated peatland sites, and consideration will need to be given to the impact this might have not only on the peatlands, but also on any potential World Heritage Site nomination.

The technology for harnessing tidal and wave energy is perhaps twenty years behind that for wind energy. Nevertheless consideration is already being given to the north coast, given its potential suitability. A particular issue here will be the use of the coast by peatland breeding birds. Red throated divers feed in the calmer sandy bays during the breeding season for example, and common scoters winter on the sea lochs.

The development of the infrastructure and markets for wood fuel is considered in Section 5. There are likely to be potential benefits for the peatlands, if wood fuel development can be linked to forest restructuring.

Community management and ownership

Over recent years there has been an increasing interest in community involvement in land management and ownership, spurred on by the creation of the Scottish Land Fund and the provisions of the Land Reform Act. There are various ongoing local initiatives to support community development. Scottish Executive policy is also encouraging greater community involvement in planning, as a result of which the Sutherland Partnership is currently preparing a Community Plan. A similar exercise is anticipated for Caithness under the Caithness Partnership.

Community engagement in the peatlands has the potential to ensure that community priorities are addressed, that more economic benefits are retained locally, and that a sense of ownership is maintained or developed.

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The various crofting Grazing Committees are an existing mechanism for collective management, which has been used widely in recent years, with some now planning and carrying out drain blocking for example. A number of Grazing Committees have taken advantage of changes in legislation and have carried out woodland regeneration or planting schemes. Several have used income from the Peatland Management Scheme to support wider community initiatives such as village halls (for example West Halladale), rather than retaining the benefit solely for the crofting land.

The only peatland within the Natura site in community ownership at present is on the Melness Crofters Estate. The Assynt Crofters Trust, Kylesku Crofters Trust and Culag Community Woodland Trust also own areas of peatland. In addition the North Sutherland Community Forest Trust (NSCFT) owns several large sheds at Forsinain, to be used for wood processing. The NSCFT is currently looking at ways of developing local economic benefits from forestry, which may involve land ownership. They are already involved as contractors in some of the forest clearance work being undertaken at Forsinard as part of the LIFE Peatlands Project.
**OBJECTIVE 3:** To encourage community and economic development that is compatible with safeguarding those features that make the peatlands important.

<table>
<thead>
<tr>
<th>ACTION REQUIRED TO ACHIEVE OBJECTIVE 3 AND ADDRESS ISSUES RELATING TO COMMUNITY AND ECONOMIC DEVELOPMENT</th>
<th>PARTNERS</th>
<th>PRIORITY</th>
<th>TIMESCALE</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>3.1</strong> Support community involvement in planning and management of the peatlands area.</td>
<td>THC, SNH, CC, FCS, CASE, SP</td>
<td>High</td>
<td>Ongoing</td>
</tr>
<tr>
<td><strong>3.2</strong> Ensure any development planning, community planning or community development initiatives take into account the need for sustainable management of the peatlands.</td>
<td>Community groups, THC, CASE, SNH, FCS, SP</td>
<td>High</td>
<td>Ongoing</td>
</tr>
<tr>
<td><strong>3.3</strong> Promote a more strategic approach to the development of renewable energy developments in the area.</td>
<td>SNH, THC, RSPB, FCS, SEPA, CC</td>
<td>High</td>
<td>Ongoing</td>
</tr>
<tr>
<td><strong>3.4</strong> Support renewable energy developments where these are compatible with the natural heritage.</td>
<td>SNH, RSPB, FCS, CEC, SEPA</td>
<td>High</td>
<td>Ongoing</td>
</tr>
<tr>
<td><strong>3.5</strong> Ensure infrastructure developments are compatible with natural heritage interests.</td>
<td>THC, SNH, CC, FCS, CASE, Land managers</td>
<td>High</td>
<td>Ongoing</td>
</tr>
<tr>
<td><strong>3.6</strong> Promote development of sustainable peatland and non-timber forest products and product branding.</td>
<td>THC, CASE</td>
<td>Medium</td>
<td>Medium - Long</td>
</tr>
<tr>
<td><strong>3.7</strong> Review economic and community benefits arising from the peatlands.</td>
<td>SNH, CASE</td>
<td>Medium</td>
<td>Long</td>
</tr>
</tbody>
</table>

**TABLE 3**
Despite the acknowledged importance of the peatlands, opportunities to find out more are very limited, as are places where you can access and enjoy the peatlands. Our understanding of the peatlands is also far from complete. This section looks at issues surrounding the promotion of better understanding and enjoyment of the peatlands and identifies actions to address Objective 4.

Objective 4: To promote greater awareness, understanding and enjoyment of the wildlife, landscape, historical and cultural values of the peatlands.

Spreading the message about the peatlands

Tourism, recreation, awareness and interpretation

Levels of awareness of the value of the peatlands amongst local people have grown considerably in local years, but still remain variable. Local support for and pride in the peatlands is key to ensuring the objectives of this strategy are met, and is likely to come not only from increased awareness, but also from demonstrable economic benefit. Tourism is the most likely source for this, but in itself is more likely to be successful where there is a pride in the local area.

At present the infrastructure of interpretation facilities (both for locals and visitors), and backup support for locals involved in tourism is limited, with the notable exception of the RSPB visitor centre at Forsinard. A recent positive development is the creation of a new countryside ranger post for North Sutherland, which is likely to enable a greater emphasis to be put on the peatlands by the Council’s Ranger Service.

Given that visitor numbers are unlikely to be large, there is currently no justification for major capital spend (for example on an additional visitor centre), and a number of small items of infrastructure (such as interpretation boards) spread geographically is likely to be more successful, with some perhaps being linked through a trail. Marketing of the area should be carried out in tandem with this proposed small-scale development, and should include actions at both a local and national level. This would not only bring potential tourism benefits, but also could engender wider support for any policy change or funding support that
might be required. Other activities that have been suggested include a “Peatfest”, viewing platforms, art competitions, and hot air balloon rides.

Planning for fixed interpretation and events will need to take into account the fragile nature of the peatlands, as peatland cannot withstand the pressure of many trampling feet or the possible disturbance to nesting birds. Nevertheless the Dubh Lochan trail at Forsinard demonstrates that access can be compatible with maintaining the nature conservation interest. Limitations are also presented by the remoteness of much of the area, with access often being only by single-track roads and in some cases a long walk.

Interpretation of the peatlands is most likely to engage people if it is linked to man’s activities in the peatlands, both today, through land management such as crofting, and historically. Interpretation of peatland restoration work should also be provided. As visitors may not initially be aware of the peatlands, interpretation should be made available at places where people are going anyway such as at accommodation providers, tourist attractions, on the train and at visitor centres (for example the proposed Caithness Horizons centre in Thurso). Opportunities should also be taken to interpret the peatlands at existing sites such as Camster Cairns and Yarrows.

Any interpretation should be provided as part of an overall agreed approach to the area and should carry the same clear messages, which are likely to include highlighting why it is special, the international importance of the area, its fragility and that people live and work here. An overall identity also needs to be developed for the area.

From a tourism perspective, increased opportunities in the peatlands should be linked to the promotion of other themes and opportunities across the whole of Caithness and Sutherland, including for example the coast and archaeology. In this way a wider market can be appealed to and the whole experience on offer is likely to be greater than the sum of the constituent parts.

There are currently very few walking, cycling or horse riding routes, other than in the forests. The identification of more peatland routes would be beneficial, particularly short walks in interesting places. Route marking, alongside promotion of the recently published “Outdoor Access Code”, could also reduce any potential conflicts with sporting and agricultural management. Despite the recent changes in legislation clarifying rights in relation to public access, no significant increase in the public’s use of open land in this area is anticipated, given the difficulty of much of the terrain.

Following on from the recently completed Highland Access Project, the Highland Access Officers are identifying and facilitating path networks around settlements in the counties. Further work is needed to identify any appropriate routes in more remote areas.

‘Local support for and pride in the peatlands is key to ensuring the objectives of this strategy are met’

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World Heritage Site nomination

In 1999 the Flow Country was added to the "Tentative List" held by the UK government of sites that might be put forward for nomination as World Heritage Sites. UNESCO bestows this international accolade on either natural or cultural properties of outstanding universal value. The Flow Country would be submitted in the natural heritage category, but to date no action has been taken to progress the nomination. Nominations are made through the Scottish Executive and then through the UK government, and are more likely to be taken forward where there is a clear demonstration of support from local communities, land managers and other interest groups. Any submission would need to be accompanied by a management strategy for the area.

If a nomination were to be successful it would not bring with it any additional planning procedures or burdens for land managers in the area. As an accolade however, this international designation could make a significant contribution to raising the profile of the peatlands, both nationally and internationally. It might also stimulate additional funding to develop aspects of this strategy.

There is strong support from a large number of local and national organisations for the proposed nomination of the peatlands as a World Heritage Site. At present many landowners and managers support the nomination in principle, but would like further information on the implications of any designation and reassurance as to the possible impacts on their land management.

Research

Despite the international importance of the peatlands, research efforts have been sporadic, hampered by a lack of funding and the remoteness of the area from most universities and colleges. RSPB are currently carrying out research to look at the impact of forest blocks and their removal on bird populations on adjacent peatlands. They are also examining whether drain blocking has a beneficial impact on the carbon balance, by reducing the breakdown of peat. FCS has carried out extensive research on the impacts of forestry on peatlands and the potential for peatland restoration. Research is also underway at the Plantlife reserve at Munsary. A survey of historic landuse has recently been completed for Caithness and will shortly be complemented by a survey for Sutherland.

There is currently no agreed strategy on what research and monitoring is required to increase our overall understanding of the development of and current condition of the peatlands and to guide land management decisions.

A key issue on which little research has been carried out is the potential impact of climate change on the peatlands. Increasingly drier summers and heavier rainfall events in autumn/ winter are anticipated, with overall rainfall amounts increasing. This is likely to cause increasing erosion in peatland areas. By the 2050s the temperature is likely to be 1-2 C above the temperature at the end of the last century. These increasing temperatures and drier summers are likely to have negative impacts on peat formation.

Obligations under the Water Framework Directive (WFD) may result in additional monitoring and research requirements in the area. The principle objective of the WFD is to achieve “Good Ecological Status” in all of Scotland’s waterbodies by 2015.
**OBJECTIVE 4:** To promote greater awareness, understanding and enjoyment of the special wildlife, landscape, historical and cultural values of the peatlands.

<table>
<thead>
<tr>
<th>ACTION REQUIRED TO ACHIEVE OBJECTIVE 4 RELATING TO SPREADING THE MESSAGE ABOUT THE PEATLANDS</th>
<th>PARTNERS</th>
<th>PRIORITY</th>
<th>TIMESCALE</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.1 Establish a forum of those involved in the management of the peatlands to oversee co-ordination and monitoring of this strategy.</td>
<td>SNH, FCS, VisitScotland, RSPB, CC, Plantlife, THC, Land managers, Land management interest groups, Community and other interest groups</td>
<td>High</td>
<td>Short</td>
</tr>
<tr>
<td>4.2 Prepare an interpretive strategy for the peatlands, seek funding for and promote its implementation, including both local and national actions.</td>
<td>SNH*, VisitScotland, FCS, THC, CASE, Plantlife, Community and tourism interest groups</td>
<td>High</td>
<td>Short</td>
</tr>
<tr>
<td>4.3 Review existing interpretation facilities/materials and revise as required.</td>
<td>SNH, VisitScotland, All interpretation providers</td>
<td>Medium</td>
<td>Short</td>
</tr>
<tr>
<td>4.4 Undertake and support interpretation projects that encourage community involvement and bring local benefit.</td>
<td>VisitScotland, SNH, FCS, CASE, THC</td>
<td>High</td>
<td>Ongoing</td>
</tr>
<tr>
<td>4.5 Encourage all interpretation providers within the peatlands to promote peatland messages where appropriate e.g. Scottish Executive, Historic Scotland, FCS, RSPB.</td>
<td>All interpretation providers</td>
<td>Medium</td>
<td>Short</td>
</tr>
<tr>
<td>4.6 Provide training on interpretation of the peatlands for those who work with visitors and interest groups.</td>
<td>CASE, FCS, SNH, UHI VisitScotland</td>
<td>Medium</td>
<td>Short</td>
</tr>
<tr>
<td>4.7 Encourage and provide appropriate recreation and access facilities.</td>
<td>CASE, SNH, FCS, THC, VisitScotland, Community, tourism and recreation interest groups</td>
<td>Medium</td>
<td>Short - medium</td>
</tr>
<tr>
<td>4.8 Develop and market the peatlands as a green tourism destination and support appropriate ventures that bring local benefit.</td>
<td>CASE, VisitScotland</td>
<td>Medium</td>
<td>Medium</td>
</tr>
<tr>
<td>4.9 Undertake initial preparatory work for a future WHS bid.</td>
<td>THC, SNH</td>
<td>High</td>
<td>Short</td>
</tr>
<tr>
<td>4.10 Hold workshop to promote research in the peatlands and identify a research and monitoring programme.</td>
<td>SNH*, FCS, RSPB, Education and research bodies, HS</td>
<td>Medium</td>
<td>Short</td>
</tr>
<tr>
<td>4.11 Support and undertake research and monitoring that enhances understanding of the development and current status of the peatlands and associated habitats and species and the impact of management on them.</td>
<td>SNH, FCS, SEPA, RSPB, Education and research bodies, HS</td>
<td>Various</td>
<td>Ongoing</td>
</tr>
<tr>
<td>4.12 Foster links between those engaged in research on both present environments and palaeo-environments.</td>
<td>HS, SNH, RSPB, FCS, SEPA, Education and research bodies</td>
<td>Medium</td>
<td>Medium</td>
</tr>
</tbody>
</table>

**TABLE 4**
What happens next?

This strategy offers a new beginning for those managing and looking after the peatlands of Caithness and Sutherland. A wide range of organisations and individuals have already expressed their support for the strategy, through their enthusiastic participation in its development. Ongoing support is now essential if the strategy is to be translated into action on the ground and policy change.

The next step is to develop the action tables into detailed work programmes with costings. For each of the actions in the strategy, a lead partner or group of partners will be identified to lead on implementation. Numerous other organisations and individuals will also need and wish to be involved in the implementation process. A key proposal in this strategy is to establish a forum of those involved in the management of the peatlands. This forum will oversee implementation of the strategy and spread the word about progress with it.

Additional funding will be required for many of the proposed actions. In some cases this can be addressed through reprioritisation of existing funds, but in other cases additional sources of funding will need to be sought.

Although the strategy is the result of much deliberation, it should still be considered very much as a working document and not the “last word” on the subject. There is still much that is not fully known about the peatlands and about the impacts of both former land use policies and restoration techniques. Future revisions of the strategy will be informed by experience, changes in community, economic and environmental conditions, and the results of monitoring and research.
Bibliography and sources of further information

- Macpherson, C and MacLeod, D 2002 A survey of the attitudes and awareness of local people and communities to the peatlands of Caithness and Sutherland.
- UNESCO World Heritage homepage http://whc.unesco.org/pg.cfm?cid=31
Annex 1
SAC and SPA descriptions

Caithness and Sutherland Peatlands SAC

Site details

<table>
<thead>
<tr>
<th>Country</th>
<th>Scotland</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unitary Authority</td>
<td>Highland</td>
</tr>
<tr>
<td>Grid Ref*</td>
<td>NC886402</td>
</tr>
<tr>
<td>Latitude</td>
<td>58 20 10 N</td>
</tr>
<tr>
<td>Longitude</td>
<td>03 56 15 W</td>
</tr>
<tr>
<td>SAC EU code</td>
<td>UK0013602</td>
</tr>
<tr>
<td>Area (ha)</td>
<td>143538.7</td>
</tr>
</tbody>
</table>

* This is the approximate central point of the SAC.

General site character

Inland water bodies (standing water, running water) (3%)
Bogs. Marshes. Water fringed vegetation. Fens (78.5%)
Heath. Scrub. Maquis and garrigue. Phragmites (18%)
Dry grassland. Steppes (0.5%)

Annex I habitats that are a primary reason for selection of this site

3130 Oligotrophic to mesotrophic standing waters with vegetation of the Littorelltea uniflorae and/or of the Isoëtophytos-Nanojuncetea
Caithness and Sutherland Peatlands supports a range of high-quality freshwater loch habitats that include Oligotrophic to mesotrophic standing waters. The lochs are part of large, generally nutrient-poor, drainage systems which characterise this part of the northern Highlands. The site covers an area greater than 140,000 ha and includes several hundred freshwater lochs of which the larger are oligotrophic. The lochs are generally located within 7130 blanket bog and peatlands that sit on nutrient-poor rocks. The aquatic vegetation is dominated by a very narrow range of species typical of northern, upland, lochs but there is much local variation in their abundance. The most characteristic species are shoreweed Littorella uniflora, water lobelia Lobelia dortmanna, bulbous rush Juncus bulbosus, bog pondweed Potamogeton polygonifolius and alternate water-milfoil Myriophyllum alterniflorum. More mesotrophic lochs support a wider range of pondweed Potamogeton species; other species present include stoneworts Chara spp. and Nitella spp. and least bur-reed Sparganium natans. The margins of a few lochs support two nationally scarce plants; bog hair-grass Deschampsia setacea and marsh clubmoss Lycopodiella inundata. Other notable species include awlwort Subularia aquatica and water sedge Carex aquatilis. The range of aquatic invertebrates includes the nationally rare water beetle Oreodytes alpinus.

3160 Natural dystrophic lakes and ponds
This site represents Natural dystrophic lakes and ponds on 7130 Blanket bogs in northern Scotland. The scale and diversity of the peatlands of Caithness and Sutherland make them unique in Europe. They are three times larger than any other peatland area in either Britain or Ireland. The site is important because of the considerable abundance of large (several square kilometres) continuous areas of Sphagnum carpets and hummocks, including Sphagnum fuscum, S. imbricatum and S. pulchrum, and for its numerous intact pool systems. Not only are these features usually rare and localised on other bog systems in the UK, but a very high proportion of this ground remains undisturbed. The vegetation is mainly cross-leaved heath Erica tetralix with Sphagnum papillosum as well as reedgrass Trichophorum cespitosum and hare’s-tail cottongrass Eriophorum vaginatum blanket mire. Freshwater pools and lochs are an integral component of the mire expanse.

Annex I habitats present as a qualifying feature, but not a primary reason for selection of this site

4010 Northern Atlantic wet heaths with Erica tetralix

7140 Transition mires with Erica tetralix

1355 Otter Lutra lutra
This extensive site contains numerous lochs, lochs and extensive areas of headwaters of burns and rivers. There is extensive habitat suitable for otters Lutra lutra and this is reflected in the presence of a good population, representative of the northern mainland of Scotland.

Annex II species present as a qualifying feature, but not a primary reason for site selection

Not applicable.
The Caithness & Sutherland Peatlands are located across the northernmost parts of mainland Scotland. The SPA contains a large proportion of these peatlands, which form one of the largest and most intact areas of blanket bog in the world. The peatlands include an exceptionally wide range of vegetation and surface pattern types (pool systems), some of which are unknown elsewhere. This range of structurally diverse peatland and freshwater habitats supports a wide variety of breeding birds including internationally important populations of raptors, wildfowl and waders.

### Qualifying species

This site qualifies under Article 4.1 of the Directive (79/409/EEC) by supporting populations of European importance of the following species listed on Annex I of the Directive:

#### During the breeding season:

- **Black-throated Diver Gavia arctica**, 26 pairs representing at least 16.3% of the breeding population in Great Britain (11 year mean, 1986-1996)
- **Golden Eagle Aquila chrysaetos**, 5 pairs representing at least 1.3% of the breeding population in Great Britain (Count, as at 1992)
- **Golden Plover Pluvialis apricaria**, 1,064 pairs representing at least 4.7% of the breeding population in Great Britain (Count, as at mid-1990s)
- **Merlin Falco columbarius**, 54 pairs representing at least 4.2% of the breeding population in Great Britain (Count, as at early 1990s)
- **Red-throated Diver Gavia stellata**, 80 pairs representing at least 0.5% of the breeding population in Great Britain (Two year mean, 1993-1994)
- **Short-eared Owl Asio flammeus**, 30 pairs representing at least 3.0% of the breeding population in Great Britain (Count, as at mid-1990s)
- **Wood Sandpiper Tringa glareola**, 5 pairs representing up to 50.0% of the breeding population in Great Britain (Two year mean, 1994-1995)

This site also qualifies under Article 4.2 of the Directive (79/409/EEC) by supporting populations of European importance of the following migratory species:

#### During the breeding season:

- **Common Scoter Melanitta nigra**, 27 pairs representing <0.1% of the breeding Western Siberia/Western & Northern Europe/Northwestern Africa population (1996)
- **Dunlin Calidris alpina schinzii**, 1,860 pairs representing at least 16.9% of the breeding Baltic/UK/Ireland population (Count, as at 1994)
- **Greenshank Tringa nebularia**, 256 pairs representing at least 0.4% of the breeding Europe/Western Africa population (1994/95)
- **Wigeon Anas penelope**, 43 pairs representing <0.1% of the breeding Western Siberia/Northwestern/Northeastern Europe population (1994)
Conservation Objectives for Caithness and Sutherland Peatlands Special Area of Conservation

ANNEX I HABITATS

(* indicates European priority habitat)

To avoid deterioration of the qualifying habitats:

- Blanket bogs*
- Depressions on peat substrates of the Rhynchosporion Natural dystrophic lakes and ponds
- Northern Atlantic wet heaths with Erica tetralix
- Oligotrophic to mesotrophic standing waters with vegetation of the Littorelletea uniflorae and/or of the IsoëtophyphenoldstyleNanojuncetea
- Transition mires and quaking bogs

thus ensuring that the integrity of the site is maintained and the site makes an appropriate contribution to achieving favourable conservation status for each of the qualifying features.

To ensure for the qualifying habitats that the following are maintained in the long term:

- Extent of the habitats on site
- Distribution of the habitats within site
- Structure and function of the habitats
- Processes supporting the habitats
- Distribution of typical species of the habitats
- Viability of typical species as components of the habitats
- No significant disturbance of typical species of the habitats

ANNEX II SPECIES

To avoid deterioration of the habitats of the qualifying species:

- Otter Lutra lutra

or significant disturbance to the qualifying species, thus ensuring that the integrity of the site is maintained and the site makes an appropriate contribution to achieving favourable conservation status for each of the qualifying features.

To ensure for the qualifying species that the following are maintained in the long term:

- Population of the species as a viable component of the site
- Distribution of the species within site
- Distribution and extent of habitats supporting the species
- Structure, function and supporting processes of habitats supporting the species
- No significant disturbance of the species

Conservation Objectives for Caithness and Sutherland Peatlands Special Protection Area & Ramsar Site

1. Conservation Objectives for Caithness and Sutherland Peatlands SPA

To avoid deterioration of the habitats of the qualifying species:

- Black-throated Diver Gavia arctica
- Common Scoter Melanitta nigra
- Dunlin Calidris alpina schinzii
- Golden Eagle Aquila chrysaetos
- Golden Plover Pluvialis apricaria
- Greenshank Tringa nebularia
- Hen Harrier Circus cyaneus
- Merlin Falco columbarius
- Red-throated Diver Gavia stellata
- Short-eared Owl Asio flammeus
- Wigeon Anas penelope
- Wood Sandpiper Tringa glareola

or significant disturbance to the qualifying species, thus ensuring that the integrity of the site is maintained.

To ensure for the qualifying species that the following are maintained in the long term:

- Population of the species as a viable component of the site
- Distribution of the species within site
- Distribution and extent of habitats supporting the species
- Structure, function and supporting processes of habitats supporting the species
- No significant disturbance of the species

2. Conservation Objectives for Caithness and Sutherland Peatlands Ramsar Site

To promote the conservation of the wetland so as to avoid deterioration of the wetland habitats of Ramsar interest and significant disturbance of associated species.
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Acronyms and abbreviations
ATVs All Terrain Vehicles
CASE Caithness and Sutherland Enterprise
CAP Common Agricultural Policy
CEC Community Energy Company
CC Crofters Commission
DCS Deer Commission for Scotland
DMG Deer Management Group
EU European Union
FCS Forestry Commission Scotland
HS Historic Scotland
LBAP Local Biodiversity Action Plan
LIFE L’Instrument Financier pour l’Environnement / The Financial Instrument for the Environment
LPP LIFE Peatlands Project
NCC Nature Conservancy Council
NHFT North Highland Forest Trust
NSA National Scenic Area
NSCFT North Sutherland Community Forest Trust
PMS Peatland Management Scheme
RSPB Royal Society for the Protection of Birds
RSS Rural Stewardship Scheme
SAC Scottish Agricultural College
SAC Special Area of Conservation
SEERAD Scottish Executive Environment and Rural Affairs Department
SEPA Scottish Environmental Protection Agency
SFP Single Farm Payment
SNH Scottish Natural Heritage
SSSI Site of Special Scientific Interest
SP Sutherland Partnership
SPA Special Protection Area
THC The Highland Council
UK BAP UK Biodiversity Action Plan
UNESCO United Nations Educational, Scientific and Cultural Organisation
WFD Water Framework Directive
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Braemore, Caithness; Pool system at Shielton; Black-throated diver and Sundew

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Further information on the Project is available at [www.lifepeatlandsproject.com](http://www.lifepeatlandsproject.com)