Scottish Natural Heritage

ARRAN NORTHERN MOUNTAINS SITE OF SPECIAL SCIENTIFIC INTEREST

SITE MANAGEMENT STATEMENT

Site code: 90

19 Wellington Square
Ayr
KA7 1EZ

Tel: 01292 261392
Fax: 01292 269493

Purpose

This is a public statement prepared by SNH for owners and occupiers of the SSSI. It outlines the reasons it is designated as an SSSI and provides guidance on how its special natural features should be conserved or enhanced. This Statement does not affect or form part of the statutory notification and does not remove the need to apply for consent for operations requiring consent.

We welcome your views on this statement.

Description of the site

Arran Northern Mountains Site of Special Scientific Interest (SSSI) on the Isle of Arran supports a variety of habitats and species. The mountains, which include two nationally important geological areas of Ordovician and Tertiary Igneous rock exposures, support the largest and most diverse upland habitat assemblage in west central Scotland. This habitat assemblage includes blanket bog, subalpine wet dwarf-shrub heath, subalpine dry dwarf-shrub heath, alpine heath, and alpine moss heath. The north west of the site supports the most extensive area of birch woodland within the site. The vascular plant assemblage includes endemic whitebeams and the Killarney fern while the diverse upland breeding bird community includes hen harrier, peregrine and golden eagle. The invertebrate interest includes both dragonfly and water beetle assemblages.

The mountains of north Arran are a south-westerly outlier of the South West Highlands, with landforms similar to those of the Highlands. The corries and cliffs are sharply defined, particularly in the Goatfell range in the east. The summits of the western heights of the Beinn Bharrain chain are less accentuated but still more pronounced than most other hills in southern Scotland. These two mountain blocks are separated by the wide glacial valley of Glen Iorsa. The vegetation displays the same kind of patterns seen on the higher mountains of western Scotland.

The plant and animal communities within the site show characteristics influenced by the maritime climate, acidic rock and soil formations, as well as altitudinal characteristics, not seen on the mainland of southern Scotland. An uninterrupted sequence of plant communities from sea-level to mountain tops can be found over a short distance.

Geological interest

Arran is regarded as a unique microcosm of Scottish geology. It encompasses, within a comparatively small area, a richness and diversity of rock types and formations that document many of the events in the last 700 million years of Scotland's history. The Northern Mountains include two areas of particular geological significance.

In the north-east of the site, in North Glen Sannox, there are exposures formed during the Ordovician period, which occurred about 470 million years ago. These formed when the floor of an ancient ocean was squeezed between what is now the Highlands and Midland Valley, along what is now the Highland Boundary Fault. The Glen Sannox rocks represent one of a number of narrow, 'fault-bounded' exposures, consisting of Ordovician ocean floor sediments (silts and muds) and igneous (volcanic) rocks that outcrop intermittently along the Highland Boundary Fault Zone. The oldest of the Glen Sannox Ordovician igneous rocks are pillow lavas formed from molten rock on the ancient ocean floor that once separated the Highlands from the lowlands.

The Ordovician Igneous feature is deemed to be in favourable condition as the key exposures remain intact with regard to extent, composition and structure. However there has been significant hammering of the shale and pillow lavas in the Sannox Burn area that is likely to have a detrimental effect on the feature and therefore it may be appropriate to adopt a no hammering policy and erect signs explaining why hammering and fossil collecting should be minimised.

Ancient Dalradian metamorphic rocks, which formed from sands, silts and muds laid down in an ocean environment over 600 million years ago are also present within the site. These rocks show dramatic evidence of being intruded by granite. This process involved molten rock moving upward through the Earth's crust and intruding into the Dalradian rocks around 60 million years ago, during the Tertiary geological period. The north-western part of the Northern Granite and the adjoining Dalradian rocks into which it was forced while molten, are visible in the mountain block between Guala Riabhach, south of Beinn Bharrain, and Glen Catacol. The granite of Arran's Northern Mountains formed when Scotland and Greenland were being pulled apart by continental drift with the formation of the north-east Atlantic. The granites represented volcanic activity deep in the crust, whereas volcanic rocks (such as lavas erupted from central volcanic vents) occur elsewhere. During tertiary times molten rock, or magma, also forced itself through the pre-existing layers of rock as basic (dolerite) or acid (felsite) sills - sheets of intrusive rock.

It is noteworthy that the Northern Granite consists of two intrusions of granite - an older, coarser granite that forms the higher hills and a younger, finer granite in the centre forming the lower ground. At Glen Catacol over 700 meters of relief expose how the granite was forcibly intruded as a molten mass that disturbed and transformed the pre-existing Dalradian rocks of the area, such as altering sandstones to white quartzites.

The volcanic remnants in northern Arran have, over the last 55 million years or so, been heavily eroded. This has removed the characteristic volcano shape and has worn the rocks down to the level where the molten rock or magma exploited points of weakness in the crust. These magma reservoirs, which fed the vent, cooled to form

granite, a very hard rock that is more resistant to erosion than the surrounding ancient sedimentary (Dalradian) rocks. The geomorphological features resulting from the glaciation of the area are also of considerable interest.

The Tertiary Igneous feature is deemed to be in favourable condition as all key exposures are intact with regard to extent, composition and structure.

Upland assemblage

The mountains support the largest and most diverse upland habitat assemblage in west central Scotland. Dry heath is common throughout the site on steep slopes. Where slopes level out, a transition community containing blaeberry gives way to blanket bog at lower altitudes. Purple moor grass, deergrass and hare's-tail cottongrass are dominant in these bogs, with their composition varying with altitude and topography.

At higher altitudes, on more exposed slopes the dry heath takes on a prostrate growth form and communities such as fescue-blaeberry heath and wind-clipped alpine moss heath (dominated by *Racomitrium* moss) with large patches of dwarf willow are found. Dwarf juniper *Juniperus communis* ssp *nana* is an important component of the wet heath community, below 600m. On north-east facing slopes immediately below ridges, such as on Beinn Bharrain, small areas of blaeberry snow-bed vegetation may be found. In the lower parts of several glens (e.g. Glen Sannox and Glen Rosa) bracken forms a mosaic with purple moor grass and heather over large areas.

In line with the guidance in use at the time the monitoring was carried out, the condition of the upland assemblage feature overall was determined purely on the basis of the extent of the component habitats (blanket bog; subalpine dry dwarf-shrub heath; alpine heath; and alpine moss heath) and therefore the condition was assessed as favourable. However, the individual habitat components were also looked at in more detail at a number of sample points to give a better idea of the effects of current management. This highlighted a number of concerns with the actual condition of the individual habitat components. There were areas of eroding soil, associated with trampling on the spur extending northwest from north Goatfell, although it is unclear whether the damage is due to walkers or herbivores. Extensive burning was also evident on the north face of Suidhe Fhearghas, a subalpine dry dwarf-shrub heath area of high sensitivity. It is thought that past grazing and burning regimes may have facilitated the spread of bracken on the lower slopes which is affecting the areas of dry heath. Areas of blanket bog and wet heath have also been damaged due to cumulative grazing pressure and there has been a very wide spread outbreak of heather beetle. In order to improve the condition of all components of the upland assemblage feature it will be necessary to review some management measures.

Upland birch woodland

The most extensive area of native birch woodland on Arran is found in the north-west, between Lochranza and Catacol. The canopy is predominantly birch, although rowan, oak and ash are locally present. Throughout the site a few scattered trees can be found on the crags (usually rowan) but trees are more common on steep-sided river banks or gullies at lower elevations where rowan, birch and rarely aspen occur.

The upland birch woodland feature is in an unfavourable, declining condition as although there was no loss in the area of woodland, the feature failed due to its very open canopy cover in places due to the historic overgrazing (by a combination of deer and sheep). The presence of invasive species such as bracken and rhododendron are also threats to this feature, suppressing natural regeneration.

Vascular plant assemblage

The vascular plant interest within the site includes the nationally rare endemic whitebeams (the Arran service-tree, the Arran whitebeam and the Catacol whitebeam), which are listed as vulnerable in the British Red Data Book (RDB). These endemic tree species are restricted to the northern part of the island, growing in river gorges and are most abundant in Gleann Diomhan and the Allt nan Calman), where they are found growing with birch and rowan. Other plants in the assemblage include the gametophyte stage of the Killarney fern and the nationally scarce brown beak-sedge and alpine enchanter's-nightshade.

The vascular plant assemblage is considered to be in favourable condition as populations of all the target species were found. The assemblage was originally considered to be unfavourable as marsh clubmoss *Lycopodiella inundata* was not found during the monitoring visit. As this species has not been recorded on Arran since 1988 and is considered locally extinct, it has been removed from the vascular plant assemblage.

Invertebrate interest

Many of the mires and lochans within the site have invertebrate interest. Significant communities of dragonfly are present, particularly at Loch a' Mhuilinn in which nine breeding species have been recorded out of the ten that occur in the whole site. The tenth species, the keeled skimmer *Orthetrum coerulescens* has been found in Glen Iorsa, its only known locality in Arran and Ayrshire.

The dragonfly feature is in favourable condition as a total of nine dragonfly species were recorded and adults of the tenth known species, *Sympetrum striolatum*, were recorded just outwith the SSSI boundary. Suitable breeding habitat was also present and larvae of a number of species seen as adults were recorded.

The lochans in the vicinity of Clachan are of most interest for water beetles. Three Nationally Scarce species have been recorded here, including *Dytiscus lapponicus* at the southern limit of its Scottish range.

The beetle feature is considered to be in a favourable, maintained condition as the habitats they depend on are present and four of the five target water beetle species were found during the most recent monitoring visit: *Hydroporus morio*, *Ilybius aenescens*, *Dytiscus lapponicus* and *Gyrinus minutus*. *Stictotarsus multilineatus* was not recorded although its typical habitat is present (gravelly lochans with patchy peat). Factors such as short sampling period and prevailing weather conditions could have affected the ability to find all five target species. Therefore failing to find one species is not considered sufficient reason to warrant classing the feature as unfavourable. Some enrichment of the lochans is apparent, most likely due to the use of the Clachan prominence as a gull roost.

Breeding bird assemblage

The ornithological interest centres principally on the variety of upland breeding bird communities which feature golden plover, hen harrier, peregrine, golden eagle and red-throated diver. These species, of international importance, are listed on Annex 1 of the EC Birds Directive.

The breeding bird assemblage is in favourable condition as there is no known loss to the extent of habitats used by the breeding bird assemblage. The assemblage diversity (calculated using the BTO index score system) is above the threshold qualifying score for this habitat type. There were sixteen different breeding species present which includes two species on the BTO's Birds of Conservation Concern (BOCC) red list: hen harrier and ring ouzel and a further eleven species on the BOCC amber list. The site is the most southerly Scottish locality for ptarmigan and although there are no recent breeding records for this species, its continued presence on Arran from 1989 up until records in 2008/9 is a strong indicator of a breeding population.

Additional interest

Although not part of the notified feature the Arran population of red deer has been assessed as being almost free of hybridisation and they have therefore been declared as a refugia population. Red deer refugia were established under the Wildlife and Countryside Act 1981 (variation of Schedule 9) Order 1999. This Act makes it an offence to release sika or their hybrids or deer of the *Cervus* genus on to specified Scottish islands. The aim of the refugia is to maintain and protect the genetic integrity of the resident red deer populations through preventing the colonisation of other non-resident deer. The most significant proportion of the Arran deer herd live on the open hill land within the Arran Northern Mountains SSSI.

The large heath butterfly is found in flat wetland areas within the heather moorland, where hare's-tail cottongrass is normally found along with other nectar sources. The large heath is listed as vulnerable within the Red Data Book and is a Biodiversity Action Plan (BAP) species. Other butterflies and moths species present include the emperor moth, northern eggar, dark green fritillary and scotch argus as well as the more unusual speckled wood and green hairstreak, which are scarce within Ayrshire.

The common hawker (*Aeshna juncea*) a species of dragonfly found at this site.

Dense bracken on the slopes of the SSSI.

Natural features of Arran Northern Mountains SSSI	Condition of feature (date monitored)	Other relevant designations
Ordovician Igneous	Favourable, maintained (July 2000)	
Tertiary Igneous	Favourable, maintained (March 2007)	
Upland assemblage	Favourable, maintained (June 2006)	
Upland birch woodland	Unfavourable, declining (May 2008)	
Vascular plant assemblage	Favourable, maintained (August 2003)	
Breeding bird assemblage	Favourable, maintained (July 2009)	
Beetle assemblage	Favourable, maintained (June 2010)	
Dragonfly assemblage	Favourable, maintained (August 2002)	

Features of overlapping Natura sites that are not notified as SSSI natural features	Condition of feature (date monitored)	Designation (SPA or SAC)
Hen Harrier *Circus cyaneus* (breeding)	Favourable, maintained (July 2009)	SPA

Part of Arran Northern Mountains SSSI (1390 hectares) is designated as part of Arran Moors Special Protection Area (SPA) for breeding hen harriers *Circus cyaneus*. Hen harrier is also a protected natural feature of the SSSI as part of the breeding bird assemblage.

Past and present management

Deer stalking continues to be an important land use activity that started during the nineteenth century. A deer fence bisects the island, running along the course of the String Road south of the SSSI boundary. This restricts the movement of deer between the north and south of the island. The deer fences are inspected four times a year with an annual report submitted to the Arran Deer Management Group (ADMG). The SSSI forms the largest part of the open deer range on Arran. The Red Deer Commission produced the Arran Deer Management Plan (ADMP) in 1995 (covering 225 km^2) which is implemented by the ADMG with the objective of enhancing the management of deer in the area. Management includes setting desirable deer population targets and assigning culling figures accordingly. Deer are counted and classified at least once a year and the plan is reviewed annually. Species such as corvids, mink, feral cat and rabbits are also controlled.

Barytes, a heavy barium mineral, was mined in Glen Sannox during the last century and between the World Wars. There are disused mine buildings at the river in Glen Sannox and excavations and spoil mounds extend northwards up the slopes of Cnocan Donna. Historically there has been occasional peat cutting at Sannox for domestic use.

On the National Trust for Scotland (NTS) Goatfell property past land use practices - predominantly grazing - has removed almost all native woodland, leaving only small fragments along burn sides and on crags. The NTS are attempting to regenerate native woodland within fenced enclosures at Coire Burn, Glen Rosa and at Garbh Allt. These were installed as part of the millennium forest project. The most recent focus of activity has been the restoration of blanket bog in Corrie a' Bhradain and on Maol Donn by the installation of dams in old moor grips.

Over large areas of the site there is generally low intensity stock rearing, predominantly sheep. Some grazing is let annually and there are deer fences surrounding both agricultural and forestry holdings. Some heather management occurs in the form of muirburn.

The majority of Arran Northern Mountains SSSI is under positive management, which has and continues to be been funded through a variety of schemes including from 2003, Scottish Natural Heritage's Moorland Management Scheme (MMS). More recently these programmes have been replaced by the Scottish Rural Development Programme (SRDP) and currently (January 2011) five Rural Development Contracts (RDCs) have been concluded over sections of the SSSI. The aim of these various management schemes is, in broad terms, to encourage the establishment of an appropriate heather management programme. This was aimed initially at breaking up the undermanaged heather while allowing other areas to recover. In time it is hoped that this will create an intricate patchwork of managed heather. Other aims of the schemes are to control bracken and agree a sustainable grazing regime across the SSSI. Although the National Trust is not under a formal management agreement, they manage their ownership under a management plan agreed by SNH.

In addition to the above schemes there are two current Section 15 Management Agreements covering 208 hectares of the site. One agreement covering bracken control is due to expire in July 2012. The other agreement, due to expire in March 2017, aims to provide conditions for the long term survival and continuing evolution of the Arran Whitebeams through fencing small enclosures and to monitor the success of management measures. Gleann Diomhan supports the nationally rare endemic whitebeams and has been managed as a National Nature Reserve since 1956 but it is planned to be denotified in 2011.

The northern mountains of Arran are a very popular mountain recreation destination. Footpath repairs and construction are continually required to reduce the erosion and damage to fragile upland pathways from recreational pressure. Loose stones have been removed from scree in Glen Rosa and Glen Sannox for footpath repairs in the past. Stones are transferred by helicopter to the relevant sites. The Arran Access Trust was set up in 1999 to address access issues and it is hoped that the Trust will continue to facilitate a wider programme of footpath repairs and maintenance.

The Council Roads Department carry out maintenance of drainage ditches at roadsides and cut back verge vegetation as necessary to maintain road safety. The Hydro-electric Board rebuilt overhead power lines in 1988. The intake weir for the Claddach Hydro plan is located on the Cnocan Burn near the boundary of the SSSI. Scottish Water installed a storage tank for the Lochranza drinking water supply adjacent to the road in Glen Chalmadale.

A range of survey and monitoring has occurred within the site including: a survey of all whitebeam specimens and their general condition; upland and peatland site condition surveys; Phase 1, NVC and deer range condition surveys; NTS lichen and juniper surveys; a general visitor number surveys and bird surveys. The NTS also carry out regular heather condition monitoring, walk butterfly transects and have undertaken condition monitoring of the summit vegetation. Fixed point quadrats have been established to measure the effectiveness of the blanket bog restoration work.

The MacAulay Land Use Research Institute (MLURI) investigated the impact of burning and sheep / deer grazing on north Arran upland areas in 1996. The invasive encroachment of bracken is assessed via photographic monitoring methods and its spread is managed on limestone grassland areas by hand pulling. Elsewhere, extensive areas of bracken have been treated using aerial application of selective herbicide.

Objectives for Management (and key factors influencing the condition of natural features)

We wish to work with the owners and occupiers to protect the site and to maintain and where necessary enhance its features of special interest. SNH aims to carry out site survey, monitoring and research as appropriate to increase our knowledge and understanding of the site and its natural features and to monitor the effectiveness of the management agreements.

The EU Habitats and Birds Directives oblige Government to avoid, in SACs and SPAs, the deterioration of natural habitats and the habitats of species, as well as disturbance of the species for which the areas have been designated, in so far as such disturbance could be significant in relation to the objectives of these Directives. The objectives below have been assessed against these requirements. All authorities proposing to carry out or permit to be carried out operations likely to have a significant effect on the European interests of this SSSI must assess those operations against the relevant Natura conservation objectives (which are listed on our website through the SNHi - SiteLink facility).

1. **To maintain the condition of the geological outcrops and ensure visibility and access to outcrops** by ensuring protection from damaging impacts and that established footpaths are maintained and vegetation encroachment does not threaten to obscure the rock exposures.

   Within the Sannox Burn area pillow lavas have been damaged in the past by over-zealous hammering by geologists. Protecting this area from damaging impacts will ensure it remains intact as a valued education and teaching resource into the future. SNH recommends a no hammering policy for the site and if possible signs should be erected explaining why hammering should be minimised. Any sampling from exposures that does occur should only take place in accordance with the Geological Code.

   Access to the outcrops should be maintained by keeping routes clear of impeding structures and vegetation. Access to the site should follow the Scottish Outdoor Access Code (SOAC).

Should there be any proposals of works to roads (A841) or bridges within the Sannox Burn area, full consultation with SNH must be conducted and efforts made to minimise disturbance to any areas of geologically significant rock outcrops.

2. **To maintain the extent and enhance the condition of the upland assemblage** by ensuring damaging impacts are minimised. Such impacts include invasive species encroachment, browsing damage by deer and livestock, burning (both controlled and accidental), and recreational pressure.

   Efforts should be made to ensure no further loss of the heather moorland occurs, especially due to encroachment by rhododendron and bracken. The densest swards of bracken should be subject to control measures in the first instance. Works to control rhododendron spread should continue.
   Browsing damage from the native deer populations poses a threat to upland habitats across the site. The Arran deer population should continue to be managed at a sustainable level through implementation of the Arran Deer Management Plan. Monitoring and mapping of the deer population and the condition of the habitats within the range on an annual basis should continue to inform targets for the annual deer cull through the Arran Deer Management Group.

   High intensity burning will encourage undesirable species such as purple moor grass and could accelerate the erosion of heaths and cause damage to blanket bog habitats. Any burning on site must be in accordance with the Muirburn Code of Practice (Scottish Government 2008 or later editions). Burning must be timed appropriately and confined to a specific area at any one time. This will allow a sward of varying age and height to develop, supporting a wide range of flora and fauna. Heather beetle, which has caused damage to upland habitats, is unlikely to be controlled by burning as the beetles hibernate under the litter layer during muirburn season.

   Recreational pressure, by mountaineers, ridge-walkers and ramblers, is evident on the established footpaths to the summits with water damage from poor drainage exacerbating erosion. Established footpaths should be maintained where and when necessary, especially on summits and ridges. This will help confine the recreational pressure to these routes.

3. **To maintain and ensure the long-term survival of the populations of constituent species within the vascular plant assemblage** by ensuring protection from damaging impacts, in particular ensuring grazing takes place at appropriate levels.

   The whitebeam populations are ageing and there is a suspicion that regeneration is being limited by browsing and insect damage. It is essential that the deer exclosures in Gleann Diomhan and around the Allt nan Calman are maintained as any unhindered access by deer has the potential to suppress the natural regeneration of important species in this sensitive area.

4. **To maintain and enhance, where possible, the natural species composition of the upland birch woodland** by removing non-native species regeneration, controlling invasive species and preventing overgrazing by ensuring deer-proof fencing is maintained.

   Control of non-native tree species should be carried out where practicable by removing young trees and saplings. The removal of rhododendron within the site should continue as it shades out the native ground flora species associated with upland birch woodland. The woodland above Catacol and Lochranza contain areas of dense rhododendron where control would be appropriate.

   Bracken is a further invasive species presenting a threat to the upland birch woodland. Where bracken has formed dense swards the bracken litter may be having a smothering effect on native tree saplings and ground flora. Bracken litter takes a long time to decompose and can inhibit tree regeneration, especially of small seeded species like birch. However, it is possible that in some places the bracken is aiding birch regeneration. In locations where bracken is not dense and where conditions allow bracken to decay, the bracken fronds can provide a surrogate woodland canopy, allowing a sheltered, humid microclimate for developing seedlings. The seedlings are also afforded protection from browsing animals. Therefore assessment of the negative and positive impacts of bracken is necessary before putting control measures in place. Control should be targeted at bracken stands that are so dense they provide no positive benefits. Dead and decaying trees and branchwood should be left within the site to provide microhabitats for invertebrates.

   In order to promote natural native tree regeneration it may be necessary to erect deer fencing around important birch woodland areas to exclude grazers.

5. **To maintain the populations of water beetles and dragonfly** by ensuring protection from damaging impacts and ensuring the quality of habitat, particularly at Loch a' Mhuilinn and in the Clachans area, is maintained.

   There was no evidence of eutrophication of the lochans, pollution or tipping in the vicinity of habitat components important to the dragonfly assemblage and current management is deemed appropriate for this feature. There is evidence of rhododendron invading the area around the lochan and this should be targeted before it becomes a significant problem.

   The Clachans is a complex of largely peaty and shallow pools which are of interest for water beetles. Activities such as peat cutting and afforestation in the vicinity of the lochans at Clachan would not be appropriate.

   Marginal and emergent vegetation will have the greatest invertebrate interest and should consist of a good mixture of vegetation structure and height to accommodate the greatest range of species. Grazing in the vicinity of water beetle habitat appears to be light and is deemed appropriate. There is no excessive damage to important marginal vegetation due to trampling by stock or deer. Future monitoring will continue to assess any impacts of grazing and trampling and will inform any required management.

The habitat quality surrounding the water bodies is important for dragonflies as flower-rich areas provide nectar and pollen, whilst taller vegetation offers shelter. Some species use woodland for roosting and feeding. The surrounding habitat quality will be assessed during future monitoring and management informed accordingly. As mentioned above the woodland above Catacol and Lochranza contain areas of dense rhododendron where control would be appropriate.

6. **To maintain the diversity and populations of breeding birds** by maintaining upland habitats utilised by breeding birds.

   The main threats to the breeding bird assemblage are changes in habitats caused with burning, inappropriate grazing and heather beetle damage. Large areas of the mire and wet heath have been burnt in the past, both as controlled muirburn and via both accidental and illegal fires. Deer grazing pressure is locally high resulting in the inhibition of heath and woodland regeneration and the promotion of grassland habitat. The grazing pressure has kept woodland regeneration in check, resulting in little or no regeneration on most hill areas. Heather beetle infestation has damaged extensive areas of blanket bog, wet and dry heath throughout the site. Such damage to the upland habitat reduces the available niches for breeding birds.

   Burning, when carried out in a controlled manner, in line with the Muirburn Code of Practice, can increase the diversity of moorland habitat structure for moorland birds. However, there have been large accidental fires on Arran in the past which have damaged sensitive areas of bog and wet heath – important breeding habitat for species such as hen harrier. Any burning must be under strict management to ensure no detrimental impacts occur. Particular care must be taken to plan muirburn to avoid areas of blanket bog, screes, rock faces, juniper heath and summit vegetation, as recommended in the Muirburn Code. There have also been large fires started by deliberate acts of vandalism and occasionally by the irresponsible use of camp fire/barbeques.

   Measures are currently in place within the site to address the threats of bracken encroachment and deer grazing in sensitive upland breeding bird areas. Forestry operations adjacent to the SSSI may have positive effects on the breeding bird community through diversification and restructuring of the woodland edge, improving foraging habitat for some species.

Other factors affecting the natural features of the site

Armed Forces: HMS Gannet and the Territorial Army undertake regular manoeuvres within the Arran Northern Mountains area. Current activities are within an acceptable threshold; however any extension of these activities would require assessment of the potential impacts on the scientific interest of the site.

Front page photograph: view of Arran northern mountains, the white tufts of *Eriophorum* spp. a blanket bog coloniser, can be seen in the foreground.

Date last reviewed: 28 January 2011

Photograph credits:

Aeshna juncea on page 7 by Jens Buurgaard Nielsen, 2005
(see http://en.wikipedia.org/wiki/File:Aeshna_juncea_hovering.jpg).
Permission to use this image is granted under Creative Commons Licence Attribution-Share Alike 3.0 Generic Licence. To view this licence see (http://creativecommons.org/licenses/by-sa/3.0/) (accessed 13/01/10).