Scottish Natural Heritage

ARTHUR'S SEAT VOLCANO
Site of Special Scientific Interest

SITE MANAGEMENT STATEMENT

Site code: 91

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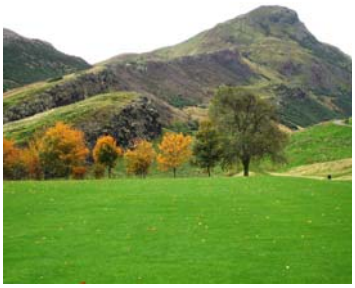
Purpose



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

Arthur's Seat Volcano Site of Special Scientific Interest (SSSI) is notified for its geological and botanical interests. The SSSI consists of three separate areas in and around the centre of Edinburgh. Holyrood Park, comprising Arthur's Seat hill itself, is the largest area, occurring to the south east of the city centre, while the smaller Calton Hill and Castle Rock form the high ground of the city centre landscape.

The small composite volcano of Arthur's Seat is one of the most studied ancient volcanoes in the world. All the component parts of a typical strato-volcano are well displayed and the sequence of eruptions can be traced with a continuity unique in Britain. The volcano consists of five vents from which separate lava flows were produced at various times. The volcanic rocks can be divided into three general groups: lavas, volcanic debris (such as ash and agglomerate) and basic intrusions, where the magma below the earth's surface was squeezed upwards or between sedimentary rock layers but did not reach the earth's surface. The geological interest takes in Holyrood Park, Calton Hill and Castle Rock. Due to its excellent exposure and the wide variety of volcanic features, Arthur's Seat is one of the most important educational sites for geology in Britain.

Features of particular geological interest include a lava lake, crater lavas, intrusive plugs and spectacular agglomerates. There are over 20 lava flows separated by tuffs (layers of consolidated volcanic ash) and tuffaceous sediments, and a range of later intrusions including the Salisbury Crag Sill which was one of the earliest sills to be recognised. The Sill was important in the development of modern geological theory, when James Hutton used evidence at Salisbury Crags to prove molten rock had intruded into older sedimentary rocks (an intrusion), and the best example on the site is known as Hutton's Section.

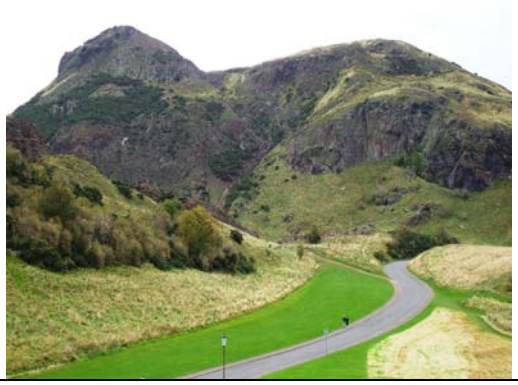
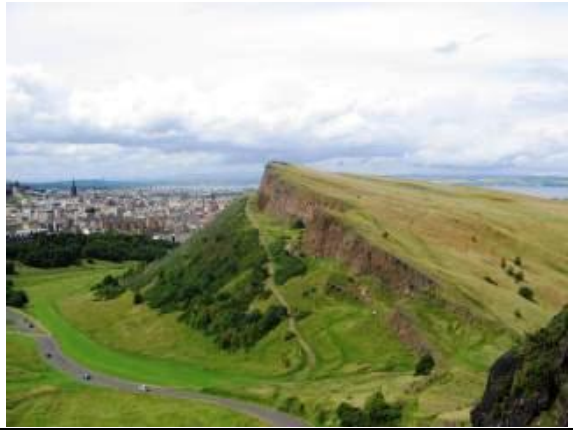
The geology of the Edinburgh area is dominated by sedimentary rocks, one group of which were deposited during the volcanic period, and formed on the flanks of the volcano. These sediments contain fossils and evidence of vegetation. The sequence of sediments mixed with the volcanics enables past environments to be determined in extraordinary detail.

The complex geology of this area is also reflected in the richness of the plant communities that are present. Holyrood Park is unique in Edinburgh as an example of lowland, unimproved grassland, and is the largest and most diverse area of such unimproved lowland grassland in the Lothian area. Depending on the underlying rock and soil type, acid, neutral and calcareous grassland have all developed on the site. Sedge-rich marsh, gorse scrub and open water with associated aquatic plants add further diversity. The park is also of exceptional interest due to the diversity of plant species present, with over 350 species of higher plant being recorded from within Holyrood Park, including a large number of rare species with over 60 plants that are rare in Scotland or the Lothian area. A number of rare bryophyte (mosses and liverworts) and lichen species have also been found. Several uncommon plants are also found on the cliffs of Castle Rock, and Calton Hill has disturbed woodland, scrub and species poor acid grassland of local interest within Edinburgh.

The adjacent Duddingston Loch SSSI is also integral to the interest of this site.

The 2001 site condition monitoring (SCM) assessment of the geological feature found it to be in a favourable condition with all exposures present and in good condition. The most recent SCM assessment of the vascular plant assemblage found the feature to be in a favourable condition with the relevant component plant populations remaining present in their existing locations or even increasing in size or range. The 2007 SCM assessments of the grassland features found each to be in an unfavourable condition. A lack of grazing (or other forms of management) has, to some extent, resulted in the grassland being species poor, with excessive sward height and a reduction in overall extent. Attempts are being made to address the existing grassland management situation through trial management plots (see below).

Natural features of Arthur's Seat Volcano SSSI	**Condition of feature** (and date monitored)
Carboniferous – Permian Igneous	Favourable - maintained (April 2001)
Lowland calcareous grassland	Unfavourable – no change (July 2007)
Lowland acid grassland	Unfavourable – no change (July 2007)
Vascular plant assemblage	Favourable - maintained (March 2009)

Arthur's Seat	Salisbury Crags
	

Present Management

Holyrood Park: The park has been managed by Historic Scotland Ranger Service since 1999. It is managed to safeguard and enhance its wild and natural character whilst providing access, enjoyment and understanding for members of the public. The park is managed to maintain its various interests including landscape, archaeology, history, geology and geomorphology, as well as to enhance its nature conservation interest and to encourage recreational use and safe access. A 10 year Management Plan (MP) was prepared in 1993 with help from SNH and the Scottish Wildlife Trust (SWT). A subsequent review of this Plan was undertaken in 2004 but no new MP has been produced to date. In the meantime, management of the park is continuing as per the old Plan.

Sheep grazing ceased in the park in 1979. Mowing takes place to manage and control coarse grasses, to increase the diversity of the grasslands and to maintain amenity areas in the park. However the grassland is not as diverse as it could be. Ideally grazing would be the most beneficial management for the grasslands but a feasibility study carried out in 2006 highlighted the costs and impracticalities of a re-introduction of grazing. Instead, cutting and burning were re-examined to find the best combination to improve the grassland habitats. This study (titled Holyrood Park Grassland Management Plan) was jointly carried out between the Ranger Service, SNH and the Scottish Agricultural College (SAC). Trial management plots have been underway since 2007 and are due to be monitored after six years, to assess the effects of the different management regimes. The trial plots are looking at varying aspects such as cutting with removal or leaving of arisings, herbicide use and burning. Initial observations suggest that cutting and collection of arisings is having the most beneficial effect.

The Ranger Service regularly survey and record the rare and uncommon plants in the park. This data collection is also useful for informing SNH's site condition monitoring programme. Most of these plants occur in inaccessible locations such as craggy rocky exposures and therefore management opportunities are limited, although not particularly required. However, seeds of some plants are transplanted to other suitable locations as opportunities arise, both within the park and to other sites within the SSSI. Some of these species are also included in the Edinburgh Local Biodiversity Action Plan (LBAP), which includes actions to continue this propogation and transplantation to other suitable areas.

The northern brown argus butterfly (UK BAP species) became extinct in Holyrood Park in 1869. However it re-appeared in the park in 2005 and the population has continued to increase annually. Rock-rose, which occurs in the park, is the food plant for the larvae of this species.

Vegetation is cleared from the geological exposures as necessary and rock faces monitored for safety. Remedial action is undertaken to stabilise rock faces where required.

Erosion, on and around footpaths, is an on-going issue due to the large numbers of people visiting the site. There has been a programme of erosion control undertaken over the last few years which include stabilising and re-grassing of the slopes, drainage and path improvements, and managing access.

Gorse is present in the park and extensive in some areas and the grassland/gorse requires on-going management, including gorse-burn. Accidental fires, and out of control gorse-burn, are an on-going risk in the park, particularly in the areas of gorse and grassland. Some fire control is undertaken with fire breaks created within the gorse. Fire can cause damage to vegetation, fauna and archaeological interest.

Some woodland management is undertaken around the park. Thinning is carried out in

plantations which have been planted over the last 30 years and Dutch elm diseased trees are cut and replaced where required.

Calton Hill: Management is carried out by the City of Edinburgh Council through the City Centre Neighbourhood Team. A 10-year Calton Hill Management Plan is currently in preparation which will co-ordinate management of the hill, its greenspace and its monuments. In recent years some management has been undertaken to improve the hill, its landscape, views, access and safety. SNH were involved in these early discussions to ensure that SSSI considerations were included. The buildings on Calton Hill are excluded from the SSSI designation.

There has also been some co-ordination of biodiversity work with Holyrood Park. There has been some planting of rock whitebeam and seeding of sticky catchfly. However the seeding subsequently failed and the Council are now trying to propagate the seed in a nursery and plant out at a later stage.

Castle Rock: Historic Scotland manages much of the rockface of Castle Rock. Stabilisation and maintenance of the rock face is undertaken on a routine basis. Recently, meshing of a large part of the rock was undertaken for health and safety reasons, as the rock surface was unstable. However, meshing is not considered compatible with the SSSI interests and discussions have taken place about possible alternatives, particularly as other parts of the rockface may require such work. It is crucial that SSSI interests (as well as World Heritage and landscape considerations) are taken into account during these discussions in order to reach a satisfactory outcome that meets all requirements.

The parkland below the rock is maintained by City of Edinburgh Council for recreational use as part of Princes Street Gardens.

Sticky catchfly was re-introduced to Castle Rock, a former location for this nationally rare species, several years ago. The seed was collected from the population at Arthur's Seat, propagated and then transplanted to Castle Rock. Some seed was also sown. It was successful but its current population status is unknown.

The Castle itself is not included within the SSSI boundary.

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

We wish to work with the owners 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 monitor the effectiveness of management.

1. **To maintain and enhance the habitat and species interest for which the SSSI is notified.**

This can be achieved through continuing grassland management at Holyrood Park and through the regular survey, monitoring and translocation of species from Holyrood park to other parts of the SSSI and beyond.

2. **To ensure that geological exposures are maintained at present levels and that adequate access to these exposures is maintained.**

This can be achieved through maintaining the current visibility of the geological features at Holyrood Park, Castle Rock and Calton Hill.

3. **To encourage recreational, educational and research use of the site, without compromising the above interests.**

Other factors affecting the natural features of the site

None noted at present.
Date last reviewed: 21 January 2011