

Scotland's Geodiversity Charter

Update Spring 2015

Scotland's Geodiversity Charter, launched in June 2012, presents a vision that Scotland's geodiversity is recognised as an integral and vital part of our environment, economy, heritage and future sustainable development, to be safeguarded and managed appropriately for this and future generations. The 57 signatory organisations of the Charter have committed to maintain and enhance Scotland's geodiversity and recognise the contribution it makes to many aspects of society. This update reports on some of the initiatives taken forward in 2014-15.

Angus Miller, Chair, Scottish Geodiversity Forum 0131 555 5488 chair@scottishgeodiversityforum.org

Focus on Tourism: How can Scotland's geodiversity boost the tourist economy?

It is widely recognised that Scotland's scenery is a major draw for visitors, consistently listed as one of the main reasons for a visit. The front page of visitscotland.com puts it explicitly: "Come and discover Scotland, world famous for its awesome scenery, vibrant culture and spectacular heritage". For many heavily-visited areas such as Glencoe, the Cairngorms, Loch Lomond, Skye and Iona, scenery is clearly one of the main attractions; but this is also undoubtedly true for Edinburgh, Stirling and many other popular destinations where the dramatic settings of the built heritage are intimately linked to geology.

The Scottish Geodiversity Forum and partners have been working with Visit Scotland to look at how we can do more to explain Scotland's scenery to visitors. The obvious starting point was with Scotland's Geoparks, and they now have an improved web presence on [visitscotland.com](http://visitscotland.com/about/nature-geography/geoparks):

[www.visitscotland.com/about/nature-geography/geoparks](http://visitscotland.com/about/nature-geography/geoparks)

We published a short paper to highlight how tourism organisations can work with the Forum and other partners to help implement the Charter. Download at <http://scottishgeodiversityforum.org/charter>

We consider that training for tourism providers is vital to highlight the benefits of a greater awareness of geodiversity. The Forum is keen to work with partners to facilitate local training sessions that introduce businesses to their local geodiversity and the added value it can bring.

Upcoming training events:

Lochaber Geopark: 4 evening classes, every Wednesday in March 2015
<http://lochabergeopark.org.uk/training-for-guides>

North West Highlands Geopark: Thursdays 19 & 26 March 2015
www.nwhgeopark.com/whatson

Scottish Natural Heritage Sharing Good Practice conference:
Geodiversity and Tourism, Wednesday 25 November 2015



Visitors approaching the Steall waterfall in the Lochaber Geopark
© Angus Miller

Scotland's three Geoparks

Geoparks are UNESCO-designated areas of particular geological importance, intended to conserve the geological heritage and promote public awareness of it, typically through tourism.

Geopark Shetland and the North West Highlands Geopark are existing members of the European and Global Geoparks Networks, and Lochaber Geopark is being evaluated to rejoin.

In 2013, all three Geoparks received Scottish Government funding for two years to enable them to take forward new initiatives and prepare business plans for future development.



The Printers' Stone, one of the overgrown rock exposures in Rouken Glen
© Steve Edwards

East Renfrewshire: exemplar Geoconservation Management Plan for Rouken Glen

Rouken Glen, a varied and very popular park in Giffnock, is a geological SSSI that features a nationally important Carboniferous rock sequence. The natural rock faces add to the scenic value of the Park and are of significant educational value. Recently, the geological features have benefited as part of major improvement works in the park, funded through the Heritage Lottery Fund's Parks for People programme and East Renfrewshire Council. The geology was being lost through landslips and vegetation growth. A broad programme of park enhancement works and initiatives is now underway including more than £56,000 being allocated specifically to restore the park's geological assets.

Given the popularity of the park and the very challenging topography of Rouken Glen, detailed geotechnical evaluation was undertaken with recommendations for enhancement work on 25 different rock exposures. This allowed the preparation of a five year Geodiversity Conservation Management Plan for Rouken Glen and work is now well underway to restore this geological gem.

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100 Great Geosites: Scotland's geology rated highly in UK-wide poll

Scotland's rich heritage in earth sciences ensured a strong showing in the final listing of the UK and Ireland's 100 Great Geosites, announced by the Geological Society in October 2014. 34 sites are listed in Scotland, from the islands of Unst and St Kilda to urban locations in Edinburgh. Scotland also provided four of the ten "people's choices" - as voted in a public poll. These are: Glencoe, the isle of Staffa, Siccar Point and the mountains of Assynt. The full listing is available at www.geolsoc.org.uk/100geosites

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The foreland mountains of Assynt
© Rob Butler

Lochaber Geopark: an outdoors playground, sculpted by nature

Funding from the Scottish Government has enabled the Geopark to employ two full time members of staff. Our application to rejoin the European Geoparks Network (EGN) has been submitted and our new website is now online. Check out our 'Rock Routes' and 'Geotrails' pages for high quality images and information. The site is now more tourist focused, without losing any of the geological content: www.lochabergeopark.org.uk

We have hosted many events this year, including regular geology walks and talks, a geology open day with visits to Strontian Mine, and participation in the very successful Wild Lochaber Festival. We are working with local guides and activity providers, and 60 people turned up to our open evening in December, keen to learn more about the landscape in which they work. We are following this up with a regular talks programme and a training course in March.

Lochaber Geopark will be opening "Darwin's Rest Coffee Shop" in Roy Bridge in early 2015 along with a shop selling local food and crafts and an information point for things to do in the Park. Located beside one of our top geosites, The Parallel Roads, we believe this will become a first port of call for visitors as they enter Lochaber.

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Documenting and managing the highlights of Scotland's geoheritage

Scottish Natural Heritage (SNH) has completed another round of Geological Conservation Review (GCR) site documentation. GCR sites represent the best and most representative examples of Britain's geology and each site is of national or international importance. GCR sites in Scotland underpin the statutory designation of geological Sites of Special Scientific Interest (SSSI). In order to manage geological SSSIs more effectively, SNH's programme of site documentation provides plain English descriptions of the geology and guidelines for management.

With over 900 GCR sites across Scotland, and only limited resources available, it has taken over twenty years to reach the final phase of the project, with only a few sites in North Highland and the Northern Isles undocumented. Photographs taken over the years are proving invaluable in site monitoring, providing a baseline record of site condition.

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Ardscalpsie Bay, Bute
© Colin MacFadyen/SNH

Fossil Five Poll – Engaging the public to select 'Scotland's Favourite Fossils'

Scotland has an amazing fossil record, spanning 1,200 million years of Earth history, and including such highlights as the world's oldest known insect, important transitional forms between amphibians and reptiles, some of the oldest known plants, and significant earliest mammal remains. Scotland's fossil heritage has therefore had a crucial role in the study of evolution.

New discoveries are still being made – for example the Tetrapod World project (<http://tetrapods.org>) is exploring the early Carboniferous rocks of the Scottish Borders, looking for fossils to fill "Romer's Gap" an important evolutionary stage in tetrapod amphibians. In early 2015, the PalAlba consortium announced the discovery of a new species of Ichthyosaur, named *Dearcmhara shawcrossi*, in a re-examination of past donations to Scottish museums.

The Fossil Five Poll runs until March – vote for your favourites at www.scottishgeology.com/poll



Case Study: working with industry to capture geoscience data - Boyne Quarry GCR site

Breedon Aggregates provided a great opportunity to access the overburden above a working quarry face at Boyne Quarry, near Portsoy, Banffshire in the summer of 2014. Jon Merritt documented the glacial facies in the cleared 12m high section and recorded new evidence for subglacial channels. The presence of sandy channel-fill deposits adds to current understanding of the sequence. Being able to access a working face as it retreats provides an unrivalled opportunity to examine the deposits and establish their three-dimensional relationships. As a result of this documentation the glaciectonic stacking of units at the site is confirmed, but some of the rafts of sand described previously may have been derived locally from similar subglacial channel fills.

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Jon Merritt, British Geological Survey and Gavin Mennie, Breedon Aggregates



Channel sand unit at Boyne Quarry
© Jon Merritt

Integrating geodiversity into the ecosystem services framework

Despite its critical importance, geodiversity is still hugely under-represented in ecosystem service assessments. A new PhD project supervised by Dr Heidi Burdett at the University of St Andrews and Drs Nicole Archer and Katie Whitbread at the British Geological Survey will attempt to integrate geodiversity into mainstream thinking. Utilising the laboratory facilities of the two institutions and the field expertise of the supervisory team, the PhD candidate will seek to develop methods for quantitatively assessing geodiversity. We are still in the process of selecting a candidate, but hope this research will get underway towards the end of 2015.

Contact Heidi Burdett hb57@st-andrews.ac.uk

East Lothian Council Geodiversity Audit

BGS Scotland has been working with East Lothian Council and Lothian and Borders GeoConservation to audit geodiversity sites in East Lothian. We have identified 30 geodiversity sites that display the best of the regions' diverse geology, and its importance in the development of the unique character of the local towns and villages. East Lothian is characterised by exceptional coastal rock exposures and its remarkable geodiversity has inspired geoscientists for well over a hundred years.

The East Lothian geodiversity audit is the latest commissioned audit conducted by BGS for local councils in Scotland, adding to previous audits for Glasgow City Council, East Dunbartonshire Council and West Lothian Council. A total of 138 geodiversity sites have now been audited across the Central Belt, contributing valuable information for the protection and management of Scotland's unique geodiversity.

Katie Whitbread, British Geological Survey kwhi@bgs.ac.uk



BGS staff auditing shore sections at Yellow Craigs, East Lothian
© Rachael Ellen, BGS/NERC

Scotland's Geodiversity Charter aligned with IUCN recommendations

In recent years, the International Union for Conservation of Nature (IUCN) has formally recognised that geodiversity is part of natural diversity and geoheritage is part of natural heritage. It has also recommended the use of inclusive terms like 'nature' or 'natural heritage' when referring to nature in general. IUCN resolutions have acknowledged the scientific, cultural, aesthetic, landscape, economic and intrinsic values of geoheritage and the wider value of geodiversity in underpinning biological, cultural and landscape diversity.

Sessions at the IUCN 6th World Parks Congress in Sydney, Australia, in November 2014, highlighted the wider values and importance of geoheritage for nature and society. This included: the relevance of all IUCN protected area categories for protecting geoheritage, the wider values of geoheritage, the relevance of geoconservation principles for sustainable management of natural systems, and the importance of understanding the functional links between geodiversity and biodiversity to maintain ecosystem health as part of an integrated approach that recognises the value of 'conserving nature's stage'. All of these form a central part of Scotland's Geodiversity Charter. For further information on geoheritage and IUCN, see: Crofts, R. & Gordon, J.E. (2014). Geoconservation in protected areas. Parks, vol. 20, no. 2, 61-76 <http://parksjournal.com/parks-20-2>

John Gordon, Scottish Geodiversity Forum

Climate change: the work of ClimateXChange to assess risks to our geoheritage

Over the last two years, ClimateXChange has looked at vulnerability to climate change of natural heritage features in protected areas, including more than 650 notified Earth Science features in Scotland's Sites of Special Scientific Interest. Scottish Natural Heritage has taken a lead role in this work alongside the James Hutton Institute, Aberdeen University and Dundee University. The project assessed risk of detrimental climate change impacts on Earth Science features based on factors including fragility, location and extent. This work will continue in 2015, and consider suitable mitigation and adaptation measures to reduce the impacts of climate change for features ranked as high risk. www.climateexchange.org.uk

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Intertidal features, like the unique permineralized Mesozoic plant remains at Eathie near Cromarty, may be vulnerable to loss due to climate change induced sea-level rise © SNH

Promoting geodiversity: the work of the Geological Societies of Edinburgh and Glasgow

The Geological Societies of Edinburgh and Glasgow encourage public interest in geology and the advancement of geological knowledge. Both societies have winter programmes of public lectures and summer excursion programmes led by experts. Each society also has local geoconservation committees that work to designate, publicise and help maintain Local Geodiversity Sites in their respective areas.

In 2014 the societies supported the "Cruise of the Betsey" project, a sailing voyage in homage to Hugh Miller's voyage of discovery on the Betsey around the Inner Hebrides, in the summer of 1844. The project was organised by the Royal Scottish Geographical Society and the Friends of Hugh Miller, and the Geological Societies gave grants that enabled two young geoscientists to take part in the voyage and for the production of educational resources.

Applications for grants from the Edinburgh Geological Society are invited from organisations or individuals, submitted by either 30 April or 31 October. Funding requests under £500 are more likely to be awarded, especially if they are matched by other funding. For more information see www.edinburghgeolsoc.org/s_awards.html

www.thefriendsofughmiller.org.uk

https://cruiseofthebetsey.wordpress.com



Simon Cuthbert reading from 'The Cruise of the Betsey' during the 2014 voyage
© Martin Gostwick

Setting the international standard for fieldwork ethics

Damage of rock outcrops is an increasing problem – with much of it done in the name of scientific research, such as indiscriminate rock coring in important conservation areas including some Sites of Special Scientific Interest. The academic geological community is coming together to stop this practice, by requiring authors of scientific papers to state that all rock materials have been collected ethically. The Geological Society, signatories to the Charter, are at the forefront of this initiative, with ethical rock sampling now at the heart of their Code of Ethics for scientific publication, as important when judging papers as other ethical considerations, such as falsification of results and plagiarism. Other publishers are moving to tighten their codes of ethics too.

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Rock coring damage in a SSSI in Assynt
© Rob Butler

Fossil tourism and conservation on Skye

Scottish Natural Heritage (SNH) and partners, particularly Scotland's museums, are looking at how Skye and Rassay's fossil heritage can be promoted as a tourism asset, being experienced and enjoyed in ways that benefit the local economy, but at the same time safeguarding our fossil heritage.

SNH is also working to improve communication between the local communities, fossil collectors, dinosaur fossil experts, museums, Highland Council, and landowners. We hope to develop a communication loop to facilitate a rapid response to instances of damaging fossil collecting and to report new fossil discoveries of national importance, in order that they may be rapidly recovered and secured for the nation.

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Dinosaur footprint, Skye
© Colin MacFadyen/SNH



The Scottish Geodiversity Forum aims to promote Scotland's geodiversity, and seeks to widen the profile of geodiversity and influence national and local policies. It is the Scottish national forum for geoconservation groups, geoparks and other related organisations, and interested individuals. The Forum promotes the role and value of geodiversity in education, community involvement and health, the development of tourism and the wider economy.

The Forum is open to all organisations and individuals who are interested in promoting Scotland's geodiversity and the sharing of experience and good practice.

www.scottishgeodiversityforum.org

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