

Climate Ready Scotland



Biodiversity and ecosystems

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for Scotland's nature and landscapes.



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On the edge of Europe, Scotland has delicately balanced ecosystems with some distinctive species. There is already strong evidence of the impact of climate change in observed changes to breeding times, the geographic distribution of species and migration patterns.

More acidic oceans, due to rising levels of carbon dioxide in the atmosphere, will weaken/damage the growth of many organisms with shells and skeletons made up of calcium carbonate. This will have profound implications for marine ecosystems.

Some plants and animals will struggle to thrive in their current locations as the climate changes while warmer temperatures will enable pests, diseases and invasive non-native species to spread. Other species that can move readily may also benefit from changing environmental conditions and extend their range into Scotland.

Ecosystems, habitats and species that are in good condition will be better able to withstand climate change. Larger and better connected areas of habitat are often more resilient and can enable some species to move location in order to find suitable habitats.

Reducing other pressures on nature (e.g. pollution, habitat fragmentation) can help habitats and species adapt in a changing climate.

Healthy ecosystems are an important part of increasing the resilience of Scotland's communities to climate change. Working with nature can help society cope with flooding, coastal erosion and over-heating:

- Vegetation, soils, rivers and wetlands play major roles in slowing run-off from catchments and absorbing overspills within flood plains.
- Managing coastal habitats, making space for natural processes, can help address the effects of rising sea level and increased storm surges.
- In cities, greenspace provides shade and can help manage floodwater.



www.snh.gov.uk/climate-change/taking-action/carbon-management/peatland-action/information-for-applicants

Peatland ACTION

Healthy peatlands actively store carbon helping us mitigate and adapt to climate change. They play an important role in water storage and regulation of river flows, reducing downstream flooding and supporting Scottish freshwater species.

Many Scottish peatlands have been degraded by drainage, burning and erosion and have lost their natural capacity to adapt to changing conditions.

Peatland ACTION is helping to re-establish the active peat forming process in degraded peatlands. In time, they will stand a better chance of thriving in a changing climate.

What we have achieved

- Restoration on more than 10,000 hectares (across 150 sites) since 2013
- Ambitious target for another 8,000 hectares in 2017/18
- Chartered Institute for Ecology and Environmental Management 'Best Practice Large Scale Conservation Project Award' in 2016

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www.snh.gov.uk/climate-change

Helping nature adapt to climate change

There are ways we can help nature adapt. Scottish Natural Heritage have developed a set of Adaptation Principles for nature conservation:

- 1 Reduce other pressures
- 2 Make space for natural processes
- 3 Enhance opportunities for species to disperse
- 4 Improve habitat management
- 5 Enhance habitat diversity
- 6 Take an adaptive approach to land and conservation management
- 7 Plan for habitat change
- 8 Consider translocation of species

These principles are being put into action in National Nature Reserves – leading the way in helping nature adapt.

What we have achieved

- Show how we can help nature adapt through Adaptation Principles and practical case studies
- Test, refine and demonstrate climate change adaptation so that others can benefit from lessons learned
- Monitor and identify which adaptation techniques work best

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www.snh.gov.uk/protecting-scotlands-nature/protected-areas/national-designations/marine-protected-areas-mpa

Implications of climate change for Scottish Marine Protected Areas

Warmer sea temperatures and ocean acidification will have wide ranging impacts on our marine habitats and species.

We need to understand the implications on the character and long-term presence of sea bed habitats and species better. Research within 48 Scottish Marine Protected Areas (MPAs) is looking at a range of habitats and species including diverse maerl beds, horse mussel and flameshell beds, the rare fan mussel, native oysters, soft sedimentary habitats like burrowed mud and rocky reefs.

What we have achieved

- A review of climate change pressures likely to affect Scotland's marine environment
- An assessment protocol to determine the sensitivity of protected features to pressures and the level of exposure of features to these pressures at each site
- Individual feature and MPA vulnerability to climate change, with consideration of the potential for features to adapt

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Edinburgh Living Landscape

A Living Landscape involves creating and restoring robust, resilient and connected green (and blue) infrastructure on a large scale.

The project will develop ways to improve the health of Edinburgh's ecosystem over the long term. This will benefit urban wildlife, and improve air quality and flood prevention, and provide more opportunities for those living in the city to encounter nature.

What we aim to achieve

- Create healthy environments, able to withstand and combat the effects of climate change
- Get more people engaged in caring for their local greenspaces
- Get more people to use Edinburgh's connected network of green and blue spaces to move around the city by walking and cycling
- New developments are planned and delivered in such a way as to create low carbon, walkable neighbourhoods, and workplaces containing high quality green infrastructure

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Urban ecosystems: Monitoring biodiversity in an urban park

Holyrood Park's dramatic hills and crags shape Edinburgh's unforgettable skyline. This rare example of unimproved grassland has been largely unchanged since the 16th century. It is a remarkable urban wildlife haven rich in plant species and home to a variety of important invertebrate, amphibian, mammal and bird species.

Historic Environment Scotland Rangers are seeing evidence that our climate is changing and affecting the Park and its wildlife.

They regularly provide data for invertebrate species within Holyrood, specifically bumblebees and butterflies. Due to their short life cycles these animals are very sensitive to any changes to the environment or climate and so are excellent indicator species of the health of our site and indeed our planet.

What we have achieved

- Ongoing monitoring of species contributes to national understanding of the impact of climate change
- Planned action on biodiversity included in the Edinburgh Adapts Action Plan

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