Responding to the impacts of climate change on the natural environment: The Shropshire Hills

A summary

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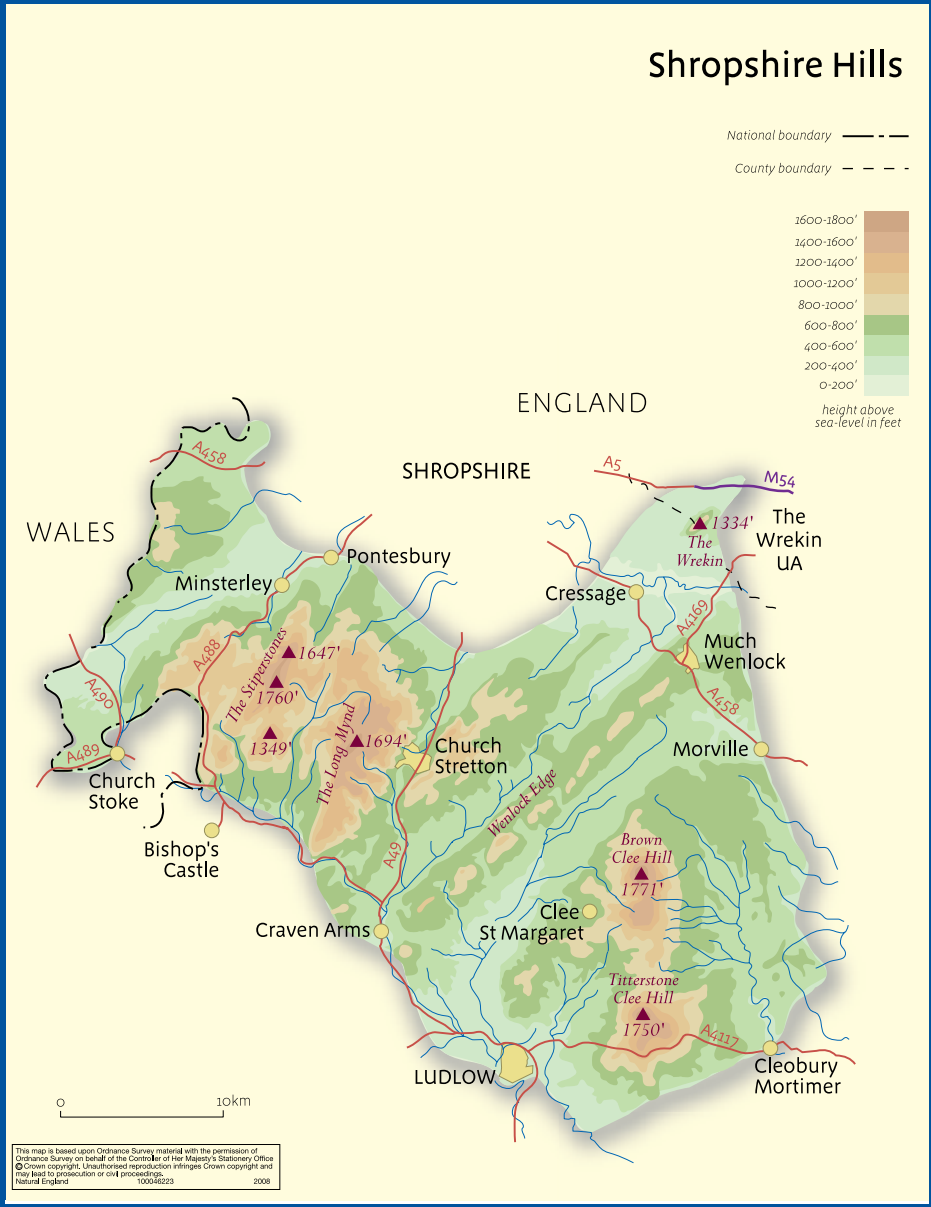
Shropshire Hills



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Introduction

Natural England is working to deliver a natural environment that is healthy, enjoyed by people and used in a sustainable manner. However, the natural environment is changing as a consequence of human activities, and one of the major challenges ahead is climate change.

Even the most optimistic predictions show us locked into at least 50 years of unstable climate. Changes in temperature, rainfall, sea levels, and the magnitude and frequency of extreme weather events will have a direct impact on the natural environment. Indirect impacts will also arise as society adapts to climate change. These impacts may create both opportunities and threats to the natural environment.

Natural England and its partners therefore need to plan ahead to secure the future of the natural environment. One way in which we are doing this is through the Character Area Climate Change Project.

The project aims to identify the local responses required to safeguard the natural environment and our enjoyment of it. In the pilot phase we are focussing on four of the 159 'Character Areas' in England, one of which is the Shropshire Hills. The others are Cumbria High Fells, the Broads, and Dorset Downs and Cranborne Chase.

This leaflet is a summary of the more detailed findings from the pilot project (these are available on our website at www.naturalengland.gov.uk). The leaflet:

- identifies significant biodiversity, landscape, recreational and historic environment assets;
- assesses the potential risks climate change poses to these assets; and
- suggests practical actions that would make them more resilient to the impacts of climate change.

What we learn from the four pilot projects will be used to extend the approach across England as part of our aim to build a healthy and resilient natural environment for the future.

Although the project is primarily concerned with the natural environment, it has also considered the impacts of climate change on other areas of Natural England's remit, including access and recreation, landscape and the historic environment.

The hoverfly Arctophila superbiens – a species that may decline in the Shropshire Hills as a result of climate change impacts. © Nigel Jones /Natural England

About the project

The objective of the Character Area Climate Change Project is to ensure that when decisions on the future of places like the Shropshire Hills are made, proper account is taken of impacts on the natural world, as well as on communities and their livelihoods. It is not Natural England's role, or intention, to take such decisions, but to initiate debate on the impacts of climate change on the natural world, so that well informed decisions about its future can be taken.

Communities and their livelihoods are vital considerations in the development of any future strategy to respond to climate change. This leaflet does not attempt to cover these issues, not because they are unimportant, but because our role is primarily in relation to the natural environment.

Ensuring a strong, healthy, diverse and inclusive society that lives within environmental limits is the key objective of sustainable development. Natural England seeks to contribute to this through its management of the natural environment. We recognise that environmental and social solutions need to proceed in tandem. Informed by this project, we will engage with communities, other organisations and Government to find approaches that deliver successful and long-term adaptation to climate change.

Taking action to respond to climate change will also depend on the cooperation of those who own and manage the land. We do not take that cooperation for granted and are aware that many measures will require appropriate incentives. At this stage we wish to explore with others potential responses which are feasible and acceptable in principle, and have not yet considered the detailed mechanisms of change.

The combined effects of drought and intense storms may damage mature trees © Nigel Jones/Natural England

Significant natural assets

The most significant biodiversity assets found in the Shropshire Hills include the following:

- European dry heaths that contain features transitional between lowland heathland and upland heather moorland. The Stiperstones is regarded as an outstanding example of European dry heath and further extensive areas occur on the Long Mynd.
- Old sessile oak woods with holly and hard fern – the Stiperstones and the Hollies contain an area of this habitat that is regarded as nationally important.
- Other nationally important habitats are semi-improved and unimproved grasslands on acidic soils, and lowland meadows.
- A number of species protected under the EC Habitats Directive, including river water crowfoot, otter, white clawed crayfish, lesser horseshoe bat, dormouse, and brook lamprey.
- Biodiversity Action Plan (BAP) priority species, including otter, water vole, red grouse, merlin, curlew and lapwing.

The majority of the Character Area falls within the Shropshire Hills Area of Outstanding Natural Beauty. Significant landscape assets include:

- moorland on the Stiperstones, Long Mynd and Clee Hills;
- unimproved semi-natural grassland across much of the area;
- ancient and semi-natural woodland, adding variety to the landscape scene;
- rivers and streams with associated lines of alder trees that are prominent features in the landscape; and
- historic environment features, including prehistoric earthworks, mine workings, veteran trees, deserted medieval villages, traditional orchards and associated planned farmsteads, historic field boundary patterns, and prehistoric and Romano-British crop mark complexes.

The Shropshire Hills also has a more varied geology than any other area of comparable size in Britain. Recognised as a classic area for geological study, the Shropshire Hills contain many sites of national and international importance

Wild flower rich lowland meadows are a feature of national importance © Wayne Davies / Natural England

for their geological features. Many of the pioneering geological investigations were carried out in south Shropshire and series names such as Wenlock and Ludlow define internationally accepted periods of geological time.

The Character Area is widely used for recreation and tourism. It possesses a number of access and recreation assets, including:

- an extensive network of public rights of way totalling 2,407 km and including popular routes such as the Offa's Dyke National Trail, Jack Mytton Way and the Shropshire Way;
- more than 6,000 ha of open access land, much of which coincides with some of the best heathland on the Stiperstones and Long Mynd;
- rivers used for angling and providing income to local landowners;
- rugged uplands, popular for off-road cycling;
- Sustrans cycle routes;
- open access land and certain routes that are popular for horse riding; and
- areas such as the Long Mynd that are well used by educational groups undertaking environmental field work.

The most significant ecosystem services provided by the Shropshire Hills, from which we all benefit, include:

- the soils and geology which underpin all of the agricultural enterprises in the area;
- water resources, which are key to agriculture and important for human and animal health;
- food and fibre products from its farming, fisheries and forestry enterprises;
- recreation, tourism and education opportunities, which are abundant throughout the Shropshire Hills;
- the important roles played by the Stiperstones and Long Mynd in holding water during peak rainfall events and helping to provide flood protection for Shrewsbury and other towns downstream in the river Severn Catchment; and
- the contribution that maintaining and expanding the heathland and woodland network is contributing towards climate regulation by locking up carbon from the atmosphere (with significant potential for further network expansion).

Likely impacts of climate change on the Shropshire Hills

Evidence from the UK Climate Impacts Programme (2002) shows that the climate in the Shropshire Hills over the coming century is likely to become warmer and wetter in winter and hotter and drier in summer. In addition, rainfall intensity will probably increase. Extreme events such as heat waves and storms are predicted to increase in frequency and severity.

The most significant impacts of climate change on the Shropshire Hills are predicted to be:

- a change in the species and communities that make up habitats;
- changes in the timing of seasonal events like flowering, breeding and migration;
- more frequent droughts, which could result in crop failures and very low river levels affecting river biodiversity;

Landscapes may change as farming practices are adapted to cope with changing weather conditions © Nigel Jones

- increased erosion in winter, resulting in more nutrients being washed into rivers;
- an increase in fire risk, particularly on areas of heathland such as the Stiperstones and Long Mynd, as outdoor recreation becomes more popular and visitor numbers grow;
- more frequent intense storm events, which means that habitats will struggle to recover from any storm damage – this may have the greatest impact in wooded areas such as Wenlock Edge;
- a loss of mature trees in the landscape as these succumb to extended droughts and more severe storms;
- differences in the ability of woodland species to adapt to a longer growing season;
- an increase in the popularity of shaded areas such as woodland for recreation as temperatures rise;
- greater risk of heat stroke and sunburn as average summer temperatures increase and peak temperature events become more frequent;
- an increase in visitor numbers;
- a reduction in the water resources that are available for agriculture, recreation, potable water supply and habitats;
- changes in the viability of some crop varieties and livestock breeds that are less able to cope with drought conditions; and
- damage to historic buildings and structures such as earthworks, caused by an increase in soil erosion during peak rainfall events.

It is important to remember that climate change will not be the only change over the coming century. Changes in farming systems, the economy, population patterns and cultural values will also affect the natural environment of the Shropshire Hills. Indeed, climate change may have a greater impact on natural assets through changes in agriculture than through direct biophysical impacts. Changes in the types and varieties of crops, sowing dates, irrigation, pests, diseases and soil erosion are all likely. Our project does not try to assess these, although they will have significant implications for the area and any proposed adaptation measures.

Adaptation options

Responding to the impacts of climate change requires adaptation to prevent natural environmental assets and the social and economic benefits that they provide from being lost. There are a number of adaptation responses that could be employed within the Shropshire Hills:

- Improve the condition of existing habitats to improve their resilience and expand their extent.
- Restore and create habitats by extending existing areas of semi-natural habitat and creating new areas. Extending existing habitat networks is recommended as the best way to safeguard the greatest number of species.
- Ensure structural diversity within new and existing habitats, so that there is a wide variety of microclimates.
- Identify research needs and commission appropriate studies to build adaptive capacity.
- Be aware of and plan for potential future catastrophic events such as the emergence of new pests and diseases. These could have significant impacts on agriculture and wildlife.
- Provide shade and drinking water at tourist attractions and recreation sites.
- In the wider landscape, promote a variety of tree species to eventually replace existing mature trees and safeguard against susceptibility to drought and storms.
- Re-establish pollarding regimes in historic parklands to reduce the susceptibility of mature trees to storm damage.
- Record and rescue some structures and known archaeology, where at extreme risk, as a safeguard against total loss of features through climate change impacts.

Walkers below the Long Mynd © Nigel Jones

- Regularly monitor and manage important geological sites to ensure that exposures remain visible.
- Manage catchments to reduce rainfall run-off from land in the upper catchment, by maintaining or establishing appropriate land cover and thus safeguarding downstream features from the risk of flooding.
- Adopt sensitive farming methods - leaving vegetated buffer strips around fields and not leaving fields bare, so that run-off of potentially harmful sediments is reduced.
- Use the spatial planning system to maintain adequate land for the natural environment.

Next steps

This project on how climate change is likely to affect the natural environment of the Shropshire Hills Character Area, and the adaptation responses required, is a significant first step but cannot be conclusive. It provides an indication of what may happen. However, the future impacts of climate change are still uncertain and are partly dependent on the amount of greenhouse gases that society releases and how much is released by natural feedback loops from the environment (one of our biggest unknowns).

When identifying adaptation actions, existing strategies, policies and initiatives need to be considered. Some actions defined as climate change adaptation are already occurring under a different name and it may be possible to modify existing programmes to provide a mechanism for delivering adaptation. An example of this is the planned incorporation of climate change adaptation into Natural England's Environmental Stewardship Scheme.

Natural England is now working on the following:

- An implementation plan, which may include a demonstration project. Natural England will work with local partners to ensure that this dovetails with existing initiatives.
- Learning from the pilot process to assess likely climate change impacts and the required adaptation strategies for other Character Areas both regionally and nationally.

The future of the Shropshire Hills depends on the actions we all take today to reduce our greenhouse gas emissions. This, combined with decisions we make about managing our landscapes to adapt to unavoidable climate change, will determine whether we continue to have a high-quality landscape that is cherished and respected by all.

Burwarton Park © Nigel Jones

Front cover photograph: View south west from the Lawley, looking towards the Long Mynd.
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Natural England is here to conserve and enhance the natural environment, for its intrinsic value, the wellbeing and enjoyment of people and the economic prosperity that it brings.

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