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# UNESCO Global Geoparks in the UK: fighting against climate change

## Executive Summary

**This document provides an overview of the measures that the UK UNESCO Global Geoparks are taking in the fight against climate change.**

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There are currently eight UNESCO Global Geoparks in the UK, all of whom are at risk from the impacts of climate change. These risks include damage to the natural environment, damage to infrastructure, risks to health and well-being, risks to business and industry, and global impacts that will have an effect on the UK.

Whilst the impact of climate change on the UK will be great there are a range of climate change mitigation and adaptation measures that are being taken across the UK UNESCO Global Geoparks.

For climate change mitigation there are examples of enhancing natural carbon sinks, more sustainable use of lands and forests, responsible consumption of natural resources, adopting renewable energy sources and developing more sustainable transport systems. For climate change adaptation there are examples of nature-based solutions, engineered solutions, encouraging behavioural change, establishing good environmental governance and gathering of research and data.

Finally, when identifying measures to address the impacts of climate change it is essential that this is done in alignment with the 17 UN Sustainable Development Goals. By looking at these holistically, the UK UNESCO Global Geoparks will have a real opportunity to not just help to mitigate and adapt to the impacts of climate change, but to make a real difference to those that live, work and visit their territories.



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## Introduction

**Climate change refers to a large-scale, long-term shift in the planet's weather patterns and average temperature as a result of natural processes or human activity. Climate change is not a new phenomenon with evidence of changing climates being found throughout our planet's 4.6 billion year history. However, unlike in our geological past, the climate change the Earth is currently witnessing is not as a result of natural processes but as a result of anthropogenic, or human activity.**

Anthropogenic climate change threatens the safety and security of livelihoods around the globe. The expected temperature increases will have significant impacts on water supply and availability, on the integrity of ecosystems, on food production, on coastal areas and those living there, and on human health. There will also be irreversible changes in the behaviour of the ocean and climate system with major impacts on the climate.

These impacts will affect the basic needs of life - food, water, shelter, health - for billions of people. In order to address the impacts of climate change, a suite of measures to reduce the risks and threats is required that includes both climate change mitigation and adaptation.

The purpose of this brief is to provide an overview of the impacts of climate change in the UK and how the UK's UNESCO Global Geoparks (UGGps) and aspiring UGGps are mitigating and adapting to its effects. It will present key climate change mitigation and adaptation measures currently or already undertaken by the UNESCO Global Geoparks in the UK and conclude by highlighting how these contribute to the UN Sustainable Development Goals (SDGs).

## List of abbreviations

CCRA	Climate Change Risk Assessment
GHG	Greenhouse gases
IPCC	Intergovernmental Panel on Climate Change
NRW	Natural Resources Wales
RLUP	Regional Land Use Partnership
RSPB	Royal Society for the Protection of Birds
SDGs	Sustainable Development Goals
TDA	Torbay Development Authority
UGGp	UNESCO Global Geopark
UKNC	UK National Commission for UNESCO
UKCUGG	UK Committee for UNESCO Global Geoparks
UN	United Nations
UNESCO	United National Education, Scientific and Cultural Organisation
UNFCCC	United National Framework Convention on Climate Change



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## UNESCO Global Geoparks in the UK

UGGps are single, unified geographical areas where sites and landscapes of international geological significance are managed holistically for protection, education and sustainable development.

There are currently eight UGGps in the UK:

1. **Black Country UNESCO Global Geopark** (England)
2. **Cuilcagh Lakelands UNESCO Global Geopark** (cross-border between the UK (Northern Ireland) and Ireland)
3. **English Riviera UNESCO Global Geopark** (England)
4. **Fforest Fawr UNESCO Global Geopark** (Wales)
5. **GeoMon UNESCO Global Geopark** (Wales)
6. **Geopark Shetland** (Scotland)
7. **North Pennines UNESCO Global Geopark** (England)
8. **North West Highlands UNESCO Global Geopark** (Scotland)

## Impacts of climate change in the UK

UK Climate Risk produces the Climate Change Independent Risk Assessment (CCRA) on a 5-year basis outlining the impact of climate change in the UK. It considers the UK Climate Projections, current climate change research, climate change progress reports and government policies and provides a summary of the key climate risks across the UK, with separate reports for each of the devolved administrations.

It identifies risks and opportunities and gives them a score depending on whether they are more urgent or less urgent. The CCRA is broken down into a number of areas including:

**Natural environments and assets:** Risks to ecosystems and to the natural environment.

**Infrastructure:** Cascading risks from storms, lightning, high winds, slope failure, flooding.

**Health and well-being:** Economic impacts from increased heat and cold health risks, vector borne diseases, health infrastructure.

**Business and industry:** Heat and reduced productivity, damage to industrial infrastructure.

In addition, the CCRA considers global dimensions in relation to the UK's international connectivity. Whilst the UK is made up of a number of islands physically, this is not the case economically and the impacts of climate change in other countries could affect the UK. For example, by disruption to supply chains or by displacement of peoples by natural disasters.



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## Climate change mitigation and adaptation

Despite the bleak outlook, there are measures that can be taken to address the impacts of climate change. These are climate change mitigation and climate change adaptation.

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### **Climate change mitigation: A human intervention to reduce the sources or enhance the sinks of greenhouse gases (GHGs) (IPCC, 2014).**

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Climate change mitigation is straightforward in theory and takes place in two ways. One is to reduce the flow of GHGs into the atmosphere (such as the burning of fossil fuels for electricity, heat or transport). The other is to enhance the 'sinks' that accumulate and store GHGs (such as the oceans, forests and soils).

However, mitigation cannot stop climate change and climate change impacts from happening as the GHGs already released into the atmosphere will remain there for many years and will take many years to work through to some climate impacts. In fact, increased climate change impacts must be expected in the future as a result of both the delayed impact from GHGs already released into the atmosphere and the continued release of GHGs into the atmosphere in the future.

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### **Climate change adaptation: The process of adjustment to actual or expected climate and its effects (IPCC, 2014).**

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Climate change adaptation is therefore necessary to address the impacts of climate change as a result of

inevitable warming due to past emissions. In reality, both adaptation and mitigation are needed to reduce the risks and threats associated with climate change.

## Fighting climate change in the UK UNESCO Global Geoparks

All of the UK UGGps and aspiring UGGps took part in a climate change workshop organised by the UK Committee for UNESCO Global Geoparks (UKCUGG) in conjunction with the UK National Commission for UNESCO (UKNC). The main purpose of this workshop was to provide information on climate change impacts in the UK and to assess what mitigation and adaptation measures have been or are being undertaken by the UK UGGps or their partners.

## Climate change mitigation in UK UNESCO Global Geoparks

### i) Enhancing natural carbon sinks

**A number of the UK UGGps are working to enhance natural carbon sinks.**

**Cuilcagh Lakelands UGGp** has been working on peatland restoration for over 20 years. The first phase of this was to restore an area of 28 hectares on Cuilcagh Mountain that was severely damaged by mechanical peat extraction. The most recent work has been with local landowners on Cuilcagh Mountain Special Area of Conservation (SAC) to stabilise and revegetate 17 hectares of eroding peat.

**English Riviera UGGp**, through its core partner Torbay Council has planted a significant number of trees at a range of sites in the area. In addition to acting as a carbon sink, these will



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help to improve air quality, help keep homes cool, provide space to improve health and well-being, and allow for the reconnection with nature.

**North Pennines UGGp** has restored over 40,000 hectares of damaged upland peatland in the past 15 years. This work provides avoided annual carbon losses of 440,000 tonnes – the equivalent of taking 7000 cars off the road each year.

## ii) More sustainable use of lands and forest

**The UK UGGps demonstrate a wide range of land-use types. Many of the UGGps are looking at how these can be better managed to enhance climate change mitigation.**

**Black Country UGGp** is working on the iTree project to help better understand and support the resilience of their 'urban forest'. The urban environment has additional stresses for trees including anticipated higher temperatures, reduced soil volumes, soil compaction and reduced access to water. This project assists climate change mitigation and will provide information to help steer future actions.

**Cuilcagh Lakelands UGGp** has developed a significant amount of recreational infrastructure to provide better access to parts of the Geopark and to ensure that the damage caused by walkers and other recreational users is minimised. This has included the installation of the Cuilcagh Boardwalk to help prevent damage to the sensitive blanket bog, and a number of forest walks and cycle trails.

**North Pennines UGGp** is collaborating with farmers in the Geopark to implement agricultural practises that improves soil carbon storage, and reduces flooding and soil erosion. In doing so, the amount of GHG emissions produced by

land-use practices will be kept to a minimum and will also provide better further carbon sinks.

## iii) Responsible consumption of natural resources

**By considering the responsible consumption of natural resources, the UK UGGps can help to reduce GHG emissions and contribute to climate change mitigation.**

**Cuilcagh Lakelands UGGp** launched its Sustainability Business Training Programme that included the training of a number of local businesses in sustainable business practices. This includes the use of locally sourced materials, consideration of energy efficiency measures, and the need to reduce, reuse and recycle waste materials.

**Fforest Fawr UGGp**, through its managing authority the Brecon Beacons National Park Authority has been leading the way in promoting responsible tourism. By encouraging less waste, more sustainable transport, and supporting local tourism providers to be more sustainable, this helps to reduce consumption supports climate change mitigation.

**GeoMon UGGp**, through its core partner Anglesey County Council became the first county in the UK to be awarded 'plastic-free' community status. This has involved putting plan in place to cut plastic waste and establishing a community-led group to communicate this message.

## iv) Adopting renewable energy sources

**English Riviera UGGp**, through its core partner the Torbay Development Agency (TDA) is the location of a proposed solar park of approximately 13 hectares due to be developed on a former landfill site at Nightingale Park, Torquay. This will provide clean



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energy for the nearby Torbay Hospital with the surplus energy being made available to the local community.

**Geopark Shetland** has embraced renewable energy sources at one of its key sites, Sumburgh Head Lighthouse. The site is being used as part of wider scheme to enhance the sustainability of the lighthouse and adjacent visitor centre and uses shallow geothermal ground source heating, as well as banks of solar panels to generate electricity. The solar panels have been designed to minimise visual impact and they emit no sound nor have moving parts which is an important element of this site as a RSPB nature reserve.

## v) Developing more sustainable transport systems

**Black Country UGGp** has been involved in a number of innovative transportation schemes including development of a canal towpath network to encourage cycling and walking, and many smaller scale investments and projects to extend and better connect local cycling and walking routes. A major development is the light transit system, Midland Metro, that will connect more communities to better public transport and will re-invigorate an abandoned rail freight line with 13 new stations including one next to the Geopark Headquarters.

**North Pennines UGGp** has been working with tourism providers right across the Geopark to promote sustainable transport as part of their sustainable tourism initiatives. This includes the provision of an electric bike network, encouraging car-free days, and promoting local walks and cycle routes that are interconnected with key Geopark sites and tourism facilities.

## Climate change adaptation in UK UNESCO Global Geoparks

### i) Nature-based solutions

**Nature-based solutions are key to climate change adaptation and is the term given to approaches that work with nature, and not against it to adapt to the impacts of climate change.**

Both the **Cuilcagh Lakelands** and the **North Pennines UGGps** are actively involved in natural flood management projects as a result of their peatland restoration projects. These have the co-benefit of enhancing biodiversity and creating more resilient ecosystems that are better able to adapt to the impacts of climate change.

**Fforest Fawr UGGp** is working with Natural Resources Wales (NRW) to remove diseased larch trees. This will help to tackle larch disease by removing diseased trees but will also provide the opportunity to re-create native woodland habitats that will generate a more resilient ecosystem.

### ii) Engineered solutions

**Whilst nature-based solutions are preferred for climate change adaptation due to their numerous co-benefits, there are occasions when hard-engineering solutions are necessary.**

To adapt to increased storm activity and rising sea-levels, English Riviera UGGp through its core partner Torbay Council, are re-assessing sea defences in Paignton and Preston. These areas are protected by a sea wall that will only provide protection for another 10 years, so in consultation with the local community, solutions are being explored to adapt to the predicted climate change impacts.



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### iii) Encouraging behavioural change

**One of the key strengths of all UGGps is their role in raising awareness of and communicating the effects of climate change to their local communities and thereby encouraging behavioural change. By increasing the preparedness of residents and visitors of UGGps, it helps to reduce vulnerability and increase resilience to climate change.**

All of the UK UGGps deliver events, activities, education programmes, volunteer opportunities and interpretation that aim to build people's connection with nature, which will lead to action for nature and build community and individual resilience.

Both the **Cuilcagh Lakelands** and **North Pennines UGGps** are working with local schools to enhance the understanding of climate change and encourage local action to mitigate and adapt to its effects. In the North Pennines UGGp a specific climate change programme for primary schools is being developed as part of a major Landscape Partnership Scheme in part of the Geopark. Whilst in the Cuilcagh Lakelands UGGp, an eco-schools programme has been established to help schools assess their contribution to climate change and provide support on how to address that.

### iv) Establishing good environmental governance

**All of the UK UGGps are embedded in, or at least partnered with local government authorities, many of whom have called climate emergencies including Black Country UGGp (West Midlands Combined Authority), Cuilcagh Lakelands UGGp (Fermanagh & Omagh District Council), English Riviera UGGp (Torbay Council) and GeoMon UGGp (Anglesey County Council).**

**This helps to ensure that climate change is mainstreamed into local government policies and strategies, and that adequate consideration is given to addressing climate change in everything that the local authorities do.**

The UK UGGps are also involved in regional-scale policy development such as the North West Highlands UGGp who are participating in the North West Highlands Regional Land Use Partnership (RLUP) pilot. RLUP pilots have been established to demonstrate how regional-led activity may help achieve Scotland's climate and environment targets in a just and fair way.

### v) Research and data

**Finally, in order to adapt to climate change, it is essential that there is a strong evidence-base on which to make decisions. Many of the UK UGGps carry out scientific research to better understand the impacts of climate and work with partners such as statutory agencies, universities and research institutions to deliver this important aspect of climate change adaptation.**

**Black Country UGGp** is part of the Black Country Observatory that collates intelligence and carries out detailed analyses on the potential impacts of climate change and how best to address these.

**Cuilcagh Lakelands UGGp** is part of the Catchment CARE project that aims to improve freshwater quality in cross-border river basins and to better understand the interaction between groundwater and surface water bodies. In doing so it will help to deliver more resilient ecosystems and will improve community understanding of the role of integrated river catchment science.



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**Fforest Fawr UGGp** through its research seminar programme is working with universities and other research institutions to use the Geopark to gain a better understanding of past climate change. It is also used to assess present day and future climate change and how they will impact not just the Geopark but the wider region.

## Climate change and the UN Sustainable Development Goals

The Sustainable Development Goals (SDGs), also known as the Global Goals, were adopted by the UN in 2015 as a universal call to action to end poverty, protect the planet, and ensure that by 2030 all people enjoy peace and prosperity. Climate change impacts upon every one of these and is a real threat to their achievement. However, each goal has measures in place to tackle climate change and it should not solely be considered as the objective of **SDG 13 (Climate Action)**.

These include:

**SDG2 (Zero Hunger)** – Climate change will have a significant impact on food security

**SDG6 (Clean Water and Sanitation)**  
– Climate change will have a significant impact on water security.

**SDG7 (Affordable and Clean Energy)** – Clean energy in the form of renewable energy is one of the major contributors to climate change mitigation efforts.

**SDG9 (Industry, Innovation and Infrastructure)**  
– Climate change needs to be taken into consideration when planning future infrastructure.

**SDG12 (Responsible Consumption and Production)** – Sustainable tourism is essential to help mitigate and adapt to climate change.

**SDG14 (Life Below Water)** and **SDG15 (Life on Land)** – Resilient ecosystems both in the marine and terrestrial habitats are essential to adapt to climate change.

**SDG16 (Peace, Justice and Strong Institutions)** – Good governance is absolutely essential to be able to provide the institutional framework to deliver climate change actions.

**SDG17 (Partnership for the Goals)** – Climate change is a global challenge, and only by working together can the fight against climate change be won.

By looking at the SDGs holistically, the UK UGGps have a real opportunity to not just help to mitigate and adapt to the impacts of climate change, but to make a real difference to the lives and livelihoods of the people that live, work and visit their territories.

This document has been prepared for the UK Committee for UNESCO Global Geoparks with the support of the UK UNESCO Global Geoparks.

