



giving  
nature  
a home

Harnessing the power of nature  
to tackle climate change:  
5 lessons based on what works





## Introduction

Many of us are seeing the impacts of climate change, not 'out there' but right here in the UK: we face hotter, drier summers and wetter winters<sup>1</sup>, both capable of bringing devastating consequences.

Nature is bearing witness too: climate change is impacting the behaviour and prospects of many species, with kittiwake numbers dropping by 70% since the 1980s due to declines in sand eel prey during the breeding season, partly due to warmer seas, and almost half of moths are in decline since 1970 due to climate change<sup>2</sup>.

Climate change and the loss of wildlife represent a twin crises that must be tackled together. Here in the UK, the Prime Minister has made clear his ambition to demonstrate global leadership on the environment.

Earlier this year, the world's top climate and biodiversity scientists confirmed<sup>4</sup> that we must address both challenges together. At home, the UK's climate advisors painted a grim vision of what will come if we fail to protect nature<sup>5</sup>.

As we approach two key global summits that will gather leaders from around the world to discuss nature and climate, it is clear that every country, including each government across the UK, must take action. And a key part of this action must be to harness the huge power of nature to tackle climate change.

This report demonstrates what is possible if we unleash nature's potential, sharing five of the most important lessons we have learnt from working with nature on the ground: storing carbon, helping to prevent flooding and safeguard communities' way of life, all while creating amazing havens for wildlife that people can enjoy.

The benefits of these 'nature-based solutions' to climate change are not restricted to climate and nature. Our practical experience, backed up by economic analysis<sup>6</sup>, shows that investing in nature projects can bring

**"If we're going to tackle climate change sustainably, we have to deal with the disaster of habitat loss and species loss across our planet..."**

**Boris Johnson,**  
April 22, 2021<sup>3</sup>

jobs to the places that need them most – highlighting the role that such projects can and need to play in a truly green economic recovery – as well as demonstrating just how cost-effective it is to protect the environment well in the first place rather than dealing with problems further down the line.

We can't afford not to invest in nature. Economists have found we can save over £176 billion over the next century if we restore our peatlands, saltmarshes and woodlands – a conservative investment that does not include benefits such as flood prevention, job creation and water quality management.

From the Solent coastline in Southern England, where saltmarsh stores carbon ten times faster than trees and helps shield communities from the devastation of rising sea levels, to the Scottish highlands where we are working in partnership with local people to restore native woodlands to their ancient limits, the natural wonders of the UK have given us an incredible return on our investment.



Imagine what could be if governments across the UK released the potential of our most precious asset – nature. By fully protecting our most special places, committing to large-scale restoration of our land and creating more, well managed havens, the nature and climate crisis stands a much stronger chance of being tackled. This report shows what is possible – for nature, the climate and people - and we look to political leaders to grasp the opportunity now. We cannot afford to wait any longer.

**Extreme weather is already threatening our health and our homes now. People in the UK are more likely to experience flooding than burglary. The deadly 2018 heatwave killed over 800 people, saw over 500 emergency water call outs and saw 10,000 subsidence claims.**

**At the same time more than one in ten UK species are at threat of extinction<sup>7</sup>. Over half of UK species are in decline and in the last 40 years almost 40 million birds have vanished from our skies<sup>8</sup>.**

## Citations

- 1 Met Office UK Climate Projections <https://www.metoffice.gov.uk/weather/climate-change/climate-change-in-the-uk>
- 2 2019 State of Nature Report: <https://www.rspb.org.uk/about-the-rspb/about-us/media-centre/press-releases/state-of-nature-2019/>
- 3 UK government speeches website: <https://www.gov.uk/government/speeches/pm-statement-at-the-leaders-summit-on-climate-22-april-2021>
- 4 IPBES-IPCC workshop report on biodiversity and climate change: <https://www.ipbes.net/events/launch-ipbes-ipcc-co-sponsored-workshop-report-biodiversity-and-climate-change>
- 5 The Climate Change Committee's June 2021 Independent Assessment of UK Climate Risk: <https://www.theccc.org.uk/2021/06/16/uk-struggling-to-keep-pace-with-climate-change-impacts/>
- 6 RSPB March 2021 *Economic benefits of nature based solutions* report: <https://www.camecon.com/what/our-work/rspb-economic-benefits-of-nature-based-climate-solutions/>
- 7 *State of Nature* report (see 1)
- 8 JNCC 2019 *Birds Directive* Report: <https://jncc.gov.uk/our-work/article-12-report-2019/>



## Lesson 1: Harness the power of our dynamic coasts: Medmerry

Medmerry Nature Reserve, in West Sussex, sits on a section of England's southern coastline which includes the small town of Selsey. This area was at extreme risk of flooding from high tides and storms. However, restoration of 183 hectares of intertidal habitat, including saltmarsh, means that Medmerry now provides not only some of the most important places for birds in Britain but cost-effective flood-risk management for 348 properties, for the local water treatment facility and for the only road to a local town servicing 5,000 residents. The new saltmarsh area also sequesters and stores carbon, helping to mitigate climate change, and helps the area to adapt to sea level rise and coastal erosion caused by climate change.

This was all achieved through a process known as managed realignment. Indeed, Medmerry is one of the largest open coastal managed realignments in Europe. Managed realignment involves building new sea defenses inland from the coast and allowing a new 'intertidal'

area to form seaward of the new defenses. Natural intertidal habitats such as saltmarshes and mudflats would ordinarily absorb strong waves to reduce the depth and length of peak water levels and erosion from storm surges. When this habitat is lost, or when it is not able to move naturally inland as sea levels rise, coastal communities are put at much greater risk of flooding. Projections suggest that UK will lose almost 3,000ha of intertidal habitat by 2050 due to climate change and sea level rise, and increased coastal erosion (RSPB Sustainable Shores Report, 2018). It is estimated that one in six people in England are living in properties at risk of flooding<sup>1</sup>.

There have been significant economic benefits from the managed realignment at Medmerry. Maintenance of the previous coastal defences, a 3km shingle bank, was costing the Environment Agency £300,000 per year. The overall direct economic benefits are estimated at £90 million, compared with project

cost of £28 million<sup>2</sup>. Climate benefits have also been important. Per unit area, coastal ecosystems can sequester and store more carbon dioxide than any other ecosystem<sup>3</sup> with saltmarshes sequestering carbon considerably faster than tropical rainforests<sup>4</sup>, whilst also creating incredible homes for wildlife and recreation spaces for the local community.

Local people are using this new, easily accessible green space to exercise and socialise and collectively help manage the reserve, which helps improve their health and mental wellbeing<sup>5</sup>. The project has also helped to attract green tourism; based on the use of the car parks alone, it is estimated that there are at least 30,000 visitors a year. Local farmers are also able to get higher prices for the beef produced from the cattle that graze the saltmarsh grasses on site, given that the beef has a higher percentage of salt that is favored by consumers.



Since the creation of the site, bird populations have flourished. In 2019, there were peak counts of 72 shoveler, 152 shelduck, and 1321 teal (Sussex Bird Report, 2019). The breeding and wintering populations of wading birds such as avocets, lapwings and oystercatchers have all increased significantly. Notably, avocets first bred at RSPB Medmerry in 2014, and in 2019, 22 pairs nested. Also in 2014, black-winged stilts bred, only the third successful breeding record in the whole of the UK.

### Lesson learned:

**Harnessing the power of our coastal wetlands through managed realignment provides not just carbon storage but vital protection to coastal communities and nationally important species.**

## Lesson 2: Work with business in ingenious ways: Wallasea Island

The Essex coast was a haven for wildlife 400 years ago, but coastal erosion and land conversion for agriculture meant that only a tenth of the original precious saltmarsh habitat on this coast remained. In response, the RSPB's Wallasea Island Wild Coast Project in Essex is an incredible example of habitat re-creation and a nature-based solution to climate change, which pioneered working with businesses to restore the saltmarshes and help local people adapt to rising sea levels – achieving remarkable things for carbon, nature and community.

Wallasea's saltmarsh had been enclosed by sea defences and drained for arable crops. However, in early 2008, the RSPB was approached by Crossrail Ltd regarding a project to build major new railway connections under central London. The company was seeking a beneficiary to re-use more than three million tonnes of clean spoil from their tunnelling. The Wallasea Island Wild Coast Project was born and sought to use this spoil to transform this island back into amazing intertidal coastal marshland, by raising the island and allowing hard sea coastal defences to breach to facilitate controlled flooding of the new saltmarsh and wetlands in a managed realignment like that at Medmerry. Public consultations with Local Authorities, Yacht Clubs and local communities helped the RSPB develop the reserve design that we see today.

The ability of Wallasea to hold water now helps to protect the adjacent estuary and land from the negative impact of an unplanned breach of its seawall, contributing to providing a long-term flood defence solution for the estuary. It also provides valuable habitat for coastal wildlife, sequesters carbon, and provides health and wellbeing benefits to the local community by providing a fantastic site for outdoor recreation. At 670 hectares, it is the largest coastal habitat restoration ever completed in the UK – twice the size of the City of London.

The £8 million project involved making approximately 160 hectares of the site available to Crossrail to use the earth from London tunnels to raise the land above sea level. The Environment Agency provided significant funding, working with other partners including Defra and Natural England, which helped secure that land as replacement intertidal habitat to offset losses of this habitat elsewhere. This resulted in the creation of a new 115-hectare intertidal area of saltmarsh, islands and mudflats, named Jubilee Marsh. Saline lagoons, a creek network and grazing marsh are managed by sluices to control water levels, creating a variety of depths of water to suit different species.

Wallasea sits within a Special Protection Area, meaning it is internationally important for wildlife. It provides remarkable habitats for breeding water birds such as avocets, terns (over 100

and 70 pairs respectively) and black headed gulls (2000 pairs). Around 30,000 water birds spend winter at the reserve, with eight species recorded in nationally important numbers, and 4 species present in internationally important numbers. In 2020, a survey found 25 nationally scarce invertebrate species across the reserve, and the



site also provides a nursery area for commercially important European seabass and herring – encouraging visiting common seals. The wet grassland is grazed by cattle that manage grass length for wading birds, such as black-tailed godwits and spoonbills and birds of prey such as short-eared owls and marsh harriers.

**Lesson learned:** working in innovative partnerships with business can present wildlife-friendly flood-defence solutions to the impacts of climate change upon our coastal communities that work for people, nature and carbon.



## Lesson 3: Prioritise peat: Forsinard

Flows to the Future, in the North of Scotland, was an ambitious partnership project led by RSPB Scotland, restoring areas of blanket bog in the heart of the Flow Country that had been damaged by forestry planting and drainage. It also involved and continues to connect people with this precious habitat, delivering real economic benefits for one of the most remote areas of Scotland.

Peat bogs are an important defence against climate change because the dead plant material in the peat contains carbon. As long as the peat remains wet, this carbon stays locked up, preventing its release as carbon dioxide into the atmosphere. Blanket bog is a rare type of peatland which only forms in cool places with plenty of rain and that covers the landscape like a blanket. Having grown for over

10,000 years, the peat is now up to 10 metres deep in some areas.

The Flow Country's blanket bogs alone store more than double the amount of carbon found in all of Britain's woodlands<sup>6</sup>. They are also areas of international importance for biodiversity. In addition, pollen preserved within the peat acts as an important record of past environments. However, after remaining largely untouched for millennia, a UK government drive to produce more timber in the 1970s and

'80s led to large areas of deep peat being planted with non-native forestry plantations.

This led to drying out of the peat, the release of stored carbon from the peat and the

disappearance from some areas of the habitat's special wildlife.

RSPB Scotland works in partnership with others to restore the damaged bogs by removing the forestry plantations and by blocking drainage ditches and forestry plough furrows, which allows the peat to rehydrate and start absorbing carbon rather than releasing it. So far, over 2,600 hectares of afforested bog have been cleared of trees to enable the bog to recover, but significant areas of land still need rewetted to both restore habitat and secure its carbon. According to the latest recommendations by the UK Committee on Climate Change, the UK urgently needs to rewet 100% of the UK's peatlands<sup>7</sup>.

This project to restore the degraded bog now avoids large-scale emissions of greenhouse gases at the site each year.

In addition to the carbon benefits and other important but hard to quantify biodiversity and ecosystem benefits, to offset the estimated £10.5 million total project expenditure over 5 years, future peatland restoration is expected to deliver a further £6.3 million of benefit in additional employment impacts (Gross Value Added) across Caithness and Sutherland in the next 30 years<sup>8</sup>, all whilst providing habitat for wading birds like golden plovers, dunlins and greenshanks to return once the conditions are right.

### Lesson learned:

Rewetting and restoring peat bogs is a vital step to prevent damaged peat acting as a carbon source rather than a carbon sink, whilst simultaneously providing important habitats to restore biodiversity and bringing economic value to the surrounding area.





## Lesson 4: Right tree, right place: Cairngorms Connect

Cairngorms Connect is a partnership project with a bold and ambitious 200-year vision to enhance habitats, species and ecological processes across a vast area within the Cairngorms National Park, Scotland. The project partners include the RSPB and neighbouring landowners and the area stretches over 600 square kilometres, filled with ancient woodlands, rivers, lochs, and mountains, containing vast expanses of blanket bog, tranquil wetlands and woodland bogs.

The Cairngorms Connect project seeks to enhance the ecosystem services provided by a healthy environment rich in life. We know that joined up, natural landscapes function more effectively and better serve the needs of wildlife and people and the project embraces our responsibility to deliver these benefits such as flood regulation, climate regulation, food provision and a

contribution to the quality of life, culture and well-being of local people.

This work is revolutionary in its vision and is the biggest habitat restoration project in the country, with a goal to create a seamless landscape for nature, resilient to the effects of climate change. The project also seeks to reduce carbon emissions through restoration and to increase carbon sequestration through locally-appropriate delivery of nature-based solutions to climate change.

Over 5,000 species have been recorded at Cairngorms Connect, around 20% of which are Nationally Rare or Scarce. Some are recorded nowhere else in Britain. Eagles, wildcats, pine martens, black grouse, ptarmigan, otters, lapwings, tooth-fungi, shining-guest ants and sub-Alpine mosses all find a home in the project area.

Financial support to make all of this happen comes from the Endangered Landscapes Programme<sup>9</sup> which is funded by Arcadia and managed by the Cambridge Conservation Initiative.

One of the many strands of the project focuses on enhancing native woodlands by managing herbivore impacts (domestic livestock and deer populations), the eradication of non-native trees and shrubs where they risk dominating native woodlands, and the enrichment of tree species that have been lost from native woods due to high levels of grazing.

As such, by December 2023, the project will successfully complete 800ha of new Scots pine regeneration, 600ha of new native woodland planting, repaired 900ha of damaged bog woodlands. Working with the principle 'right tree, right place', the project seeks to create a bigger forest which will be more able to accommodate the ecological impacts of large-scale

damaging events such as fire, disease and windthrow, as well as helping reduce the warming of watercourses.

Finally, one of the goals of Cairngorms Connect is to build understanding in the community about the project and to increase acceptance of the benefits of restoration. This is done through stakeholder engagement with the local community, surveys, and real market economic impact being measured in jobs and value added to the local economy.

### Lesson learned:

Adhering to the principle of 'right tree, right place' has multiple benefits for wildlife as well as the ecosystem services that the area provides for local communities and ensures the land is more adaptable to climatic changes.



## Lesson 5: People, nature and climate can live in harmony: St Aidans

At St Aidan's in the Lower Aire Valley of Yorkshire, the RSPB, the Environment Agency and Leeds City Council have created an inland 400-hectare wetland nature reserve by adapting a former opencast coal mine. The site stores 7.5 million cubic metres of flood water and can reduce the downstream flood peak by 400mm, protecting homes in Allerton Bywater, Castleford and surrounding villages.

The current site was formed when the opencast coal mining area was flooded in 1988, after the riverbank collapsed. Mining subsequently ceased in 2002 and the land was converted to a nature reserve with natural flood

management benefits. This natural flood management approach eliminated the need for expenditure on concrete walls and both protects the immediate community and prevents funnelling flood water to communities further down the Humber estuary.

The site is linked with the nearby Fairburn Ings nature reserve, which is also designed to protect locals from flooding. When the River Aire reaches capacity, water is directed onto Fairburn Ings, away from homes and business in Castleford, and the river level is reduced downstream. The visitor centre is on stilts to help protect it from the intermittent rise in water levels.

Having sites like this along a river system is a huge opportunity to protect homes and businesses from flooding, an issue identified by the Committee on Climate Change as one of the critical risks that the UK is not yet prepared for in our adaptation planning in the face of more extreme weather events<sup>10</sup>. This scheme demonstrates how we can slow the flow of water by holding flood water safely within the catchment to reduce the risk of damage to homes and increase the resilience of local communities to extreme weather events.

The site hosts 12km of public trails, promoting access to nature and outdoor exercise opportunities to the local population of Leeds. The green tourism potential for new visitors is huge, with the site acting as a vital base on the migratory journey of a wide range of birds like the curlew, lapwing and pochard.

It is also an important site for breeding populations of the black-necked grebe, bittern and redshank as well as hosting otters, harvest mice and a range of bat species. The site is made up of a tapestry of different habitats such as reedbed, wetland, meadows and woodland that support this incredible array of wildlife and bring the local community closer to nature on their doorstep.

### Lesson learned:

Natural flood management has multiple benefits for nature and people in the face of a changing climate, protecting communities from flood risks as the impacts of extreme weather events worsen, whilst providing adaptive spaces for nature to thrive and for communities to access nature.





# Estimated savings and benefits to the UK over the next century if we restore and create our **peatlands, saltmarshes** and **woodlands**

Based on carbon and recreation benefits, as well as air quality benefits for woodlands

RSPB analysis of how much of these habitats we need to restore and create over the coming decades suggests that these nature-based solutions could generate benefits worth

# £176 billion

This figure doesn't include a host of other benefits



Biodiversity



Water quality



Flood management



Noise mitigation



Temperature regulation



Job creation



## Endnotes

- 1 [https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/292928/geho0609bqds-e-e.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/292928/geho0609bqds-e-e.pdf)
- 2 <https://environmentagency.blog.gov.uk/2016/10/17/building-a-greener-future/>
- 3 <https://www.nature.com/articles/s41586-019-0951-7>
- 4 <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3704532/>
- 5 <https://www.nature.com/articles/s41598-019-44097-3>
- 6 <https://www.theflowcountry.org.uk/flow-facts/flow-fact-1/>
- 7 <https://www.theccc.org.uk/2021/06/16/uk-struggling-to-keep-pace-with-climate-change-impacts/>
- 8 <https://www.theflowcountry.org.uk/about-us/flows-to-the-future/>
- 9 <https://www.endangeredlandscapes.org/>
- 10 <https://www.theccc.org.uk/2021/06/16/uk-struggling-to-keep-pace-with-climate-change-impacts/>



**giving  
nature  
a home**

Unless otherwise stated, all images are from [rspb-images.com](https://www.rspb-images.com). Front cover: river by (shutterstock.com). Page 2: flooding by Richard Packwood, Black-legged kittiwake by David Tipling. Page 3: Storm Ciara Richard Packwood. Page 4: Medmerry by (Environment Agency), shelduck by Ben Hall. Page 5: spoonbill by Richard Brooks, Wallsea Island by David Wootton. Page 6: Peatland pools at Forsinard by David Tipling, golden plover by Mike Lane. Page 7: Cairngorms by David Tipling, capercaillie by (shutterstock.com). Page 8: St Aidans by Jennie Smith, otter by (shutterstock.com). Page 9: wild flowers by Colin Wilkinson, water vole by Ben Andrew, flooded field by Gwyn Williams, trees by (RSPB), traffic jam by Eleanor Bentall, cracked soil by Ben Andrew, hands by (shutterstock.com). Above: tree by David Broadbent.

## Our mission

The RSPB is dedicated to creating a world richer in nature. We use our expertise in birds and nature to provide evidence-based solutions to the nature and climate emergency, helping people live well in harmony with nature. We work with our partners to keep common species common, recover threatened species, protect and restore special places and inspire and enable everyone to act for nature. We are the UK partner of BirdLife International, operating in the four countries of the UK, the Crown Dependencies and Overseas Territories. We also work globally, wherever our shared nature goes or the need exists.