National Trust

# A Climate for Change:
# Adaptation and the National Trust

# Contents




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# Foreword

For 128 years the National Trust has worked to promote the protection of hundreds of historic sites and buildings, as well as the coastline, rivers and open countryside for the benefit of the nation. Throughout that time the need to adapt to new circumstances while maintaining the integrity of those treasured places has not changed. What has changed is the climate.

Without concerted action over 70% of places in the care of the National Trust will be at medium or high risk of climate related hazards by 2060. The National Trust's Council endorsed its first statement on climate change, 'Adaptation to climate change needs be integral to all Trust decision-making', in 1998. We should all - government, business, local communities and civil society - think on that. Back then, climate scientists predicted more frequent and severe floods, heatwaves, storms, and wildfires. Now, those weather events are here.

This presents specific but not unique challenges to the National Trust. For instance, buildings in England, Wales and Northern Ireland weren't historically designed to regulate heat. This means visitors, staff and volunteers may now bring different expectations in their visits to National Trust properties, like an increased desire to stay cool during longer, hotter, drier summers. It might also mean the need to be prepared for more visitors in the autumn and spring months and fewer during summer heatwaves, when more people might visit coasts over inland properties.

Reading this report, you can see the National Trust is working through these challenges to give people and property a greater degree of climate security. The importance of listening to local experts shines through, as does the understanding of the need to work collaboratively and the wisdom to accept that no one has all the answers.

Responsible stewardship is about planning for potential hazards and taking appropriate action at the right moment to pre-empt future risk. This report shows the National Trust proactively assessing evidence, investigating appropriate adaption techniques and, crucially, taking decisive action.

As I write we are once again experiencing flooding in many parts of the country, and more storms are on the way. There is a lot to learn about the best approaches to climate risks, but we can't wait for more academic research, we can see the impacts of climate change all around us (even at our favourite National Trust properties!) and we must learn on the job.

I hope this report serves as a catalyst for increased public attention on climate security, a source of guidance and support, and a powerful message to decision makers in every sector that now is the time to act. Preparing the National Trust for a changing climate isn't about overhauling the organisation, its priorities remain caring for nature, beauty and history. Instead, it is about making sure that the Trust is here in another 128 years' time, fulfilling the same purpose and continuing to care for some of the most beautiful, historic, and nature-rich places in the country.

**Emma Howard Boyd**
Global Ambassador to the Race to Resilience

# 2. The story so far

This report details how the National Trust is dealing with the impacts of climate change in the present, and how we're adapting our approach to face them in the future.

While human-induced climate change is a more recent threat, caring for places through periods of change and upheaval has always been at the heart of the National Trust. It began 128 years ago, when Octavia Hill, Canon Hardwicke Rawnsley and Sir Robert Hunter came together in the face of British industrialisation with a shared belief that nature, beauty and history should be preserved for everyone's 'enjoyment, refreshment and rest'. They committed to protecting important spaces for everyone.

In doing so, they set out on a journey: one that will see us learning from the last century of protecting places, to inform how we navigate the next. A journey of this kind means accepting that we do not have all the answers yet and that we have much to learn, but also recognising that through testing, learning and researching, we can work together to improve our responses.

Fast forward a century to 1998, when the Trust's Council endorsed its first statement on climate change: 'Adaptation to climate change needs be integral to all Trust decision-making'.

And forward again to 2005 when the Council set out core principles that have since become our guiding light:

- 'Conservation is about the management of change.'
- 'Be pioneering and innovative in our approach to climate change adaptation.'
- 'Work with the grain of natural processes.'

That same year we released two reports. The first was *Forecast Changeable*, our initial attempt to come to terms with the threats of climate change at the places we care for. It explored climate challenges as they were in 2005, and considered what future impacts we might see in the UK based on the latest science. The 'exceptional' summer heatwaves, wetter winters and increasingly frequent heavy rainfall events we predicted in 2005 are starting to become everyday realities in 2023.

The second report was *Shifting Shores,* which shared the National Trust's experience of dealing with coastal change and rising sea levels as the nation's largest coastal custodian.


**Above:** 'Forecast Changeable' and 'Shifting Shores' reports

The coasts of England, Wales and Northern Ireland were perhaps the first frontier for the impacts of climate change, and this report provided a galvanising call to action for the strengthening of the their response.

Ten years later, in 2015, we revisited both *Forecast Changeable* and *Shifting Shores,* detailing refreshed approaches, broader evidence and newer science. These documents marked important updates in how we've evolved our approaches to climate impacts and coastal change.

In 2021, we had a breakthrough in our understanding of climate risks. Working with Government partners, our newly launched mapping visualisations (the Climate Change Hazard Map – see section four) helped us flag the potential impacts of risks such as flooding and coastal erosion to a new level of accuracy and detail. This tool is now central to how we plan our adaptation efforts across the places in our care.

Today, with this report, *A Climate for Change*, we'll build on this extended legacy of understanding and dealing with change, and chart a clear course of action for the next stage in our journey. Moreover, we will set out the holistic approach to climate change adaptation that we have developed – focused on people and places, driven by data and grounded in experience.

# 3. What are the changes we need to respond to?

We can see the impacts of climate change all around us. In the last two years alone we have experienced record temperatures, long-lasting droughts and flash floods, and storms are on the rise. And it's not just the scientists who can clearly see it, it's all of us.

74% of people feel that climate change has already affected them personally, or will in the next 20 years.

**The Intergovernmental Panel on Climate Change (IPCC)[1] says that if we don't reduce global greenhouse gas emissions:**

- Many species could be 'pushed past their physiological tolerance' and there would be 'irreversible phase shifts' in marine ecosystems.
- At least 4 billion people could become permanently short of water and there's a risk that crops could fail right across the world.
- By 2050 a billion people's homes could be at risk from the effects of climate change on the coast, and by the same date 143 million people in Latin America, sub-Saharan Africa and South Asia alone could be displaced by climate effects.

This could also mean severe impacts across the UK. The Climate Change Committee's (CCC) latest assessment of climate risk[2] predicted that hot summers, like those experienced in 2018 and 2022, are likely to occur every other year by 2050, potentially tripling the number of annual heat-related deaths.

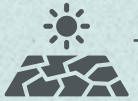
By 2050 our **average winter** will be


+1° warmer


+5% wetter

meaning more heavy rainfall events and more severe flooding.

Our **average summers** will be


+10% drier


+1.5° hotter

which could bring longer droughts and water shortages.

Sea levels will have risen


+10–30cm

since the year 2000, bringing with them serious impacts for our coasts.[3]

In order to picture what a plus-1.5 degree world could like, scientists have suggested the experiences of the Mediterranean in the summer of 2023 as a good example.

Whether or not we meet the international goal of halting global warming to 1.5 degrees, we still need to prepare for the effects of climate change that are already locked in.

## What should we focus on?

The National Trust was set up to care for places of nature, beauty and history, and the range of ways that climate change can impact what we look after is significant. In the short term, the places we care for face flooding, wildfires, drought and coastal erosion. But there are long-term threats, too, like changing weather patterns disturbing habitats for certain species, or more humid conditions in buildings slowly damaging art and collections, making conservation more challenging.

We also have our commercial business. National Trust holidays, cafés and shops generate vital funds for our conservation work, as well as providing local jobs and giving much pleasure to visitors. Changes in our climate will affect all of us, how we travel and what we do with our time. For example, hotter weather could mean that our cafés overheat, or that more people choose to visit the coast during high summer, rather than a historic house inland. It's time to find innovative ways to adapt what we offer.

## What can we do?

We don't have all the answers right now, but we're in a good place to learn more about climate change and find ways to meet the challenges head-on. To sum up our approach to climate adaptation:

- **Every choice we make** will take account of the need to be resilient and adaptable to a changing climate.
- We're **embedding our approach** into everyday operations because climate change is happening alongside other social and ecological changes.
- There's **no 'end goal'** to adapting to climate change – it's about developing a resilient way of thinking, and the ability to make confident decisions when we need to.
- We are **driven by research and evidence**. We will test, try and share new approaches.
- We **learn from the past** at every opportunity. Previous generations have much to teach us.
- We **work with nature** – rather than against it – wherever possible.
- We work **in partnership with others**.

# 3a. Coastal change and communities

The National Trust cares for over 780 miles of the coasts around England, Wales and Northern Ireland, incredibly diverse in character and alive with the stories and traditions of the past and the wildlife of today. Change on the coast is nothing new and the coastlines we see today are a result of natural processes and patterns of waves, tides, storms and changes in sea levels.

But climate change is accelerating the rate of change, increasing the severity of storms and raising sea levels faster than in living memory. This is multiplying the challenges we face in managing coastal land. Harsher erosion and tidal flooding are going to result in more damage to buildings and infrastructure, and disruption and loss for local communities who love or rely on those spaces. There is a clear need to consider how best to adapt.

## Thinking long term

While we want to manage the impacts of climate change, we know that transformation is also part of the coast's natural function. Some coastal species rely on the dynamic and ever-changing nature of these landscapes to find the right habitats and keep thriving. Avoiding these changes can stop new landscapes from forming. That's why we're working with natural processes wherever possible, as we explained nearly 20 years ago in *Shifting Shores*. It's about taking a long-term view of coastal adaptation, which might sometimes mean letting nature take its course and preparing for losses, so that we can avoid storing up problems for future generations.

One place we're preparing for change is Dinas Dinlle in Gwynedd. This archaeologically important Iron Age hillfort has been slowly weathering for a long time, but climate change is accelerating its erosion and we estimate it will eventually be lost. Three years of observations already demonstrate that the intensity of rainfall is having a significant direct impact on the erosion of the hillfort.

While defences against rising sea levels or increased rainfall may slow the rate of change, they would not be effective or sustainable in the long term. It is likely to be more appropriate to work with natural coastal processes and use the opportunity to research and record the hill fort for future generations. We're now working in partnership to investigate and record the archaeology as it emerges from the cliff and before it is lost. As part of the CHERISH project (2017–2023), led by the Royal Commission on the Ancient and Historical Monuments of Wales in collaboration with Aberystwyth University, cutting-edge technologies have been used to analyse coastal and inland archaeology and to create a digital meshed 3D model of Dinas Dinlle. This has also involved working closely with the local community, who helped to assess how storms and seasonal changes affect the site.

Monitoring will continue, with help from the Royal Commission. Through this project, Dinas Dinlle is now being captured and digitally preserved for future generations.

## Working with the community

Responding to coastal change is a more complicated question than simply assessing what might be lost. Avoiding or delaying change may sometimes be appropriate, but working against nature is always difficult and rarely a long-term solution. There can be positive as well as negative trade-offs too. Coastal change is for example sometimes an essential part of natural habitat regeneration.

On the Studland Peninsula in Dorset, we are working with local communities, the leading Local Flood Authority and the Environment Agency to implement a Coastal Adaptation Strategy. This approach seeks to set a sustainable vision for people and nature while taking full account of natural processes. Forming part of the UK's first 'super' National Nature Reserve, the Studland Peninsula is incredibly important for nature and also well loved by tourists and locals alike. It is also a naturally dynamic coastline, meaning that the whole shape of the peninsula is undergoing continual change.

Middle Beach is a popular destination towards the south of the peninsula. Sea defences are affecting natural processes across the wider bay and increasing local erosion. Rather than rebuilding or replacing these defences, we plan to remove them and reinstate the shoreline to a more natural state. This response is not without consequences. We have already had to re-locate existing buildings and infrastructure from the site, including a popular café, and are currently developing a wider vision for the whole site.

Working with others is an important element of our adaptation work on the coast. Local people and businesses can play a part in shaping the future of their changing coastline, which can help communities themselves become more resilient to change. At Studland, this has involved many public drop-in sessions, workshops and consultations. During the initial four-year design period of the Coastal Adaptation Strategy, we held fortnightly face-to-face meetings with representatives from the parish Council, local residents and beach hut users. We also publish proactive local media articles, and have put up new interpretation around the site to ensure people understand the changes they are seeing.

Ultimately coastal change, accelerated by climate change, will give as well as take. We understand the importance of ensuring that communities are equipped to slow down or resist some changes to the coast, and to protect important coastal heritage and habitats. But we are also committed to embracing the new habitats and landscapes that climate change will create, and we want to ensure communities are empowered to enjoy and thrive in them.

# Case study: Mullion Harbour, Cornwall

**Working with the local community to adapt to a changing climate**

Cornwall's sea levels have risen by 19cm since 1914 (measured by the Newlyn tide gauge) and are predicted to rise by another 80cm in the next century. Over the last 50 years, waves in the English Channel have become 50cm higher, storms are twice as frequent, and low pressures are deeper, causing much windier weather.

Mullion Harbour was built in the 1890s and the National Trust has cared for it since 1945. In that time, we've spent over £2 million repairing the harbour's two breakwaters, with more than 80 per cent of that spending since 1995, as winter storms have become more frequent and violent.

**Left:** Aerial views of Mullion Cove, Cornwall

## Threats to the harbour

In 2004 we started thinking about a long-term solution and commissioned the *Mullion Harbour Study*. The study analysed 20 years of wave data, inspected the harbour's structure and the seabed, and carried out geological, environmental, economic and archaeological surveys. The study showed us that the harbour will become more vulnerable to the impacts of climate change as it ages. The local residents, authorities and agencies involved in the study agreed a way forward: the National Trust would continue to repair and maintain the harbour for the time being while accepting that eventually a tipping point would come when it would be necessary to shift from conservation to adaptation.

## The tipping point

In the winter of 2014, the harbour was hit with 80mph winds. Some waves were more than 6m high and the area experienced its heaviest rainfall since 1770. The waves pounded the breakwaters and caused significant surface damage, washing away granite coping stones and paving setts, and damaging iron railings and bollards. A mixture of Trust money and grant funding supported some major repairs. But, less than 10 years later, we're already seeing signs of significant damage reappearing on the southern breakwater.

When the 2006 decision was reached, the tipping point for when the Trust would stop repairing the harbour was not specified. Initial thinking was that this tipping point would be a single catastrophic event like the 2014 storm. However, we are now beginning to understand that the situation is more likely to be one of gradual but persistent decline, with different adaptation timelines for the two breakwaters, given their differences in construction and condition.

## Next steps

We're collaborating with the local harbour society and cove residents to keep the working harbour welcoming and safe for residents and visitors as we plan for adaptation of the harbour structures. This approach has given the local community more autonomy over harbour operations, while making best use of long-standing skills and experience. We've been working with the community to bring people together to carry out small but vital pointing repairs on the western breakwater to support its resilience, and we are beginning to discuss what 'roll-back' of the southern breakwater might look like.

It is more important than ever that we, as local stakeholders, engage positively with the National Trust. As the effects of a changing climate accelerate, it becomes vital we accelerate our actions to match. We all need to be involved in adapting to these changes. Mullion Harbour is an incredibly special place to so many locals and visitors and I believe for that reason alone it is worth taking a positive, proactive and committed approach to its future. What happens in Mullion could set a benchmark for how we care for so many other vulnerable areas of our historic coastline for future generations to use and enjoy.

**Jonny Pascoe, Chairman of the Mullion Cove Cooperative Winch Society**

# Testimonial: Cwm Ivy Reserve, North Gower

**Change providing opportunity**

Cwm Ivy marsh is a small parcel of land on the coast of North Gower. It was claimed from the sea to be used as farmland in the 17th century and was protected by a sea wall.

The sea wall started showing signs of distress in November 2013. Heavy rain was becoming more frequent and the sluice gate that drains the marsh simply couldn't remove the water fast enough. The pressure of water forced a small hole under the wall. By the following winter, storms and high tides had begun to widen the hole, allowing sea water into the freshwater marsh. And by August 2014 the summer storms finally caused the wall to fail, effectively ending its time as a sea defence.

The landscape started to change very soon after the breach. In March 2015, we were seeing the first signs of salt marsh plants such as delicate scurvy grass, species of samphire, sea blight, thrift and sea spurrey. By June 2015 the whole marsh was alive with the vibrant greens of the healthy salt marsh that nature had originally intended.

**Peter Morgan** farms the land nearby and is using conservation grazing, which involves finding ways for grazing livestock (in this case ponies) to boost the land's biodiversity. The breach in the sea wall has provided benefits for him, too.

Peter said:

"Now we see milder winters with little or no frost, the ponies have a richer diet on the remaining grassland as it continues to grow throughout the year. To counter this, we've slowly increased the ponies' numbers to ensure the reduction of the lush grass and spartina (an invasive salt-tolerant grass species), allowing for the native marshland plants to spread and colonise the reserve.

As the sea wall breach continues to widen, we will see a less forceful tide and hopefully an equilibrium between the grasses on the reserve, as salt-tolerant plants begin to dominate. Strangely the increase in summer temperatures has had little effect on the ponies as the marsh plants adapt better to the dry spells as they continue to thrive with more salt than freshwater for their needs. The shift to salt marsh is an exciting prospect and the ponies have become so intrinsically linked to the ecosystem at the reserve it continues to captivate us as a family. As climate shift continues the little egrets have continued to spread across the marsh of North Gower and it reminds us that our ponies might one day mirror those of the Camargue in France surrounded by flamingoes and spoonbills."

# 3b. Visitor operations

Our core charitable purpose is to protect nature, beauty and history. We care for places so people can thrive, so when thinking about climate adaptation, we know we cannot just think about places in isolation. We also need to consider how these places fit in to people's lives.

Securing appropriate funding is an important part of the picture. The National Trust raises funds through membership and visits, through our shops, cafés and holiday cottages, through forestry, renewable energy and agriculture, and through our wider investments. All these areas are potentially vulnerable to the effects of climate change and so we need to consider a broad range of activities when thinking about climate adaptation. One way we capture this activity is by following an approach developed by the Task Force on Climate-related Financial Disclosures (TCFD), which aims to increase the reporting of climate-related financial information. We publish yearly updates on this in our annual report.

## Investing for the future

We're being careful about how we invest in the places we look after, making smart choices that consider both the present, and potential climate futures, when we develop and deliver projects. For example, we're ensuring that any new buildings are, wherever possible, designed to be resilient to future conditions.

This might mean, for example,

avoiding the use of too much glass to keep buildings from being exposed to intense sunlight

or deciding not to build new infrastructure in areas prone to flooding.

Our Board of Trustees has asked us to improve our ability to take future climate risk into account when making investment decisions ('Climate-informed investments'). A good example of this is at Formby, where the existing car park is increasingly affected by sand dune movement as a result of the coast receding and larger waves accelerating coastal erosion. Sand movement is reducing the number of parking spaces by eight per year, making this facility unviable in the future. Tackling this operational challenge, however, also opens up opportunities to restore the precious dunescape and create new habitats which can be future-proofed to respond more easily to the changing coastline.

The long term aim is to find a way to move visitor facilities onto higher ground, giving nature more space to move. This is challenging in an area of ecological sensitivity. Any new visitor facilities will be designed to have a low carbon footprint, and be more comfortable and sustainable for future generations of staff, volunteers and visitors.

## Adapting our business model

As well as thinking carefully about the best way to invest in the places we care for, we are also thinking about how our future business model is informed by climate change.

The weather is a significant factor in people's decision to travel and visit somewhere. To understand the potential impact of a changing climate, we commissioned early research with Oxford University School of Computing and 3Keel in 2019, which compared local Met Office weather data to visitor patterns. This confirmed that visitor numbers depend on the weather; they are higher when it's warm, and drop if certain thresholds of wind speed, temperature or rainfall were met. The results also showed us that where people choose to visit differs with the weather. As temperatures climb, people are more likely to head for the coast than historic houses.

As weather patterns change, organisations like the National Trust may have to think again about long established patterns of how we welcome visitors at different times of year. We may increasingly need to be prepared, for example, for more visitors in the autumn and spring months (predicted to become warmer as the climate shifts) and fewer during summer heatwaves or heavy winter rain. We are involved in research (funded by UK Research and Innovation (UKRI) and in partnership with Exeter University and Historic Environment Scotland) into how the connection between weather and visitors will impact visitor businesses like ours.[4] Alongside this research we are starting to consider how we may need to change the way we operate in future.

Professor Tim Coles of Exeter University offers his thoughts on this research:

> Climate change is a major consideration in the management, operations and outcomes of businesses and organisations. Very little is known about how weather impacts on visitation and spend in the heritage sector as a major part of the UK visitor economy

This is a view shared by many. The UK's second Climate Change Risk Assessment (CCRA2) identified tourism as a 'bellwether sector that is particularly vulnerable to climate risk in the UK', and the more recent Third Risk Assessment (CCRA3) stated that 'Greater UK-based tourism driven by reduced flying could place added pressure on heritage assets or vulnerable locations'.

Extreme weather will bring additional challenges beyond visitor patterns. The welfare of staff, visitors and volunteers needs to be prioritised, for instance making sure that people are not left exposed to extreme temperatures in gardens or car parks. At Ham House, for example, we have occasionally made the decision to close early when high heat has made working conditions unsafe.

Ultimately, the Trust recognises that we need to future-proof both our investments and our income streams, so that we can best look after the buildings and landscapes in our care, and the people who visit, live and work in them. This means thinking about when and how people might want to visit, as well as enabling Trust places to evolve so that people will still enjoy visiting them in the future.

# Testimonial: Keith Jones

**Senior National Consultant – Climate Change**

"There are many push and pull factors for people in deciding where and when to visit, with weather being key. Climate can be considered simply 'weather over time', and therefore we are already seeing climate change as a major factor in visiting choices.

Chatting with many members of National Trust operational teams across the years, I have been able to get an overall view of the visiting patterns we are seeing at our properties. Building on our anecdotal understanding of visiting behaviours – 'when it's really sunny visitors want to go to this part of my property, but not this part' – I've been working with several research institutions to fully codify and map these patterns by matching daily footfall across our sites with local weather station data.

Through all this, we are seeing some big pictures emerge. On hotter days, our visitors want more access to water – coasts, rivers, and lakes – meaning these areas can become congested and overcrowded without due preparation and planning. We are seeing more footpath erosion in the countryside due to periods of drought or high rainfall followed by increasing footfall. We are seeing an increase in the use of disposable barbecues which, when combined with increasing drought, creates greater risk of wildfires. These are all challenges for the ways we manage our business and protect places.

There are also positives brought about by milder weather earlier and later in the year – but these are only opportunities if we plan for and adapt to them."

# Case study: Chirk Castle, Wrexham

**Protecting trees from increased winds**

Chirk Castle sits within 480 acres of estate parkland at the meeting points of two rivers. The estate itself is a Site of Special Scientific Interest (SSSI) because it's home to rare invertebrates, bats, fungi and wildflowers.

Chirk's gardens and woods are famous for many reasons, but the veteran and ancient trees that line the estate's walkways and drives are a key feature. The trees aren't just a distinctive part of the estate's character – they also provide vital habitats for local plant and birdlife and create shelter and shade for Chirk's many human visitors.

But trees this old are particularly vulnerable to high winds and storms. In the worst cases they can be fully uprooted and blown over. This is a particular risk when trees are in full leaf due to the 'sail effect'. Similarly, extremes in weather – for example a very dry spring followed by heavy rainfall in summer can cause the trees to go into shock, causing them to drop otherwise healthy branches.

**Right:** Statue of Hercules in the Lime Walk at Chirk Castle

Chirk's staff have a detailed management plan to keep the area safe without damaging the character of the veteran trees. As part of this, the estate has long practised a 'closure threshold', which triggers if gusts of wind reach 45 mph in the winter and 40 mph in the summer.

Chirk has had to close many times over the years, mostly during the winter when the risk of storms is high but, helpfully, visitor numbers are low. Although this pattern of closures had remained fairly consistent, the property team have reported that storms are becoming more intense, with greater potential to cause damage. Storm Arwen – which hit in November 2021 – had a significant impact across the landscape, including a veteran beech tree blowing across the estate's main access route in and out. The site had to close for a week while the team cleared the drive and made it safe for visitors.

We believe that the number and length of these closures is likely to increase. Recent academic research on site by Dr Lucia Watts of Bangor University, exploring the impacts of climate change on veteran trees, highlighted a shift in storm wind direction that could potentially lead to greater exposure and seasonality (greater variances between seasons) for the veteran trees. It also concluded that Chirk's wind speed threshold could be met more often, especially during the summer months, leading to more regular closures.

The team at Chirk Castle are finding ways to lessen the effects of storms, keeping the delicate balance between enabling people to visit safely and protecting the character of the veteran trees. One of the ways they do this is by regularly performing minor tree surgery, helping the trees to be a bit more wind-resistant without losing their important features.

As is the case with many places we care for, we don't yet have all the answers to the challenges of climate change at Chirk Castle. But a combination of research and action is helping us to understand more and to make informed decisions that will help places adapt.

# 4. What is our approach?

We've been working hard to make adapting to climate change an everyday part of how the Trust is run. But this is not easy. Like many others, we are still learning, researching and testing to understand both the right actions to take, and how to motivate a positive change in our behaviour.

**And there are a few obstacles to overcome:**

- Long-term solutions cost money, and while we know acting now will deliver benefit in the long run, it can be difficult to allocate limited budgets away from current, everyday problems.
- While solving individual problems, we also need to consider the bigger picture. Will our actions at one place have a knock-on effect on the wider area?
- Nobody can predict the future, and while we can model possible changes, there is inevitably a level of uncertainty we have to account for and be prepared to meet with flexibility.

Finally, there is no standardised approach we can deliver everywhere. In the case of the National Trust, every place we look after is different, and one size does not fit all. In the hot summer of 2022, for example, two National Trust in-hand farms on roughly the same latitude experienced totally different effects. In Wales the heat meant that the farm had one of its best yields in 30 years, while in the East of England drought caused catastrophic losses.

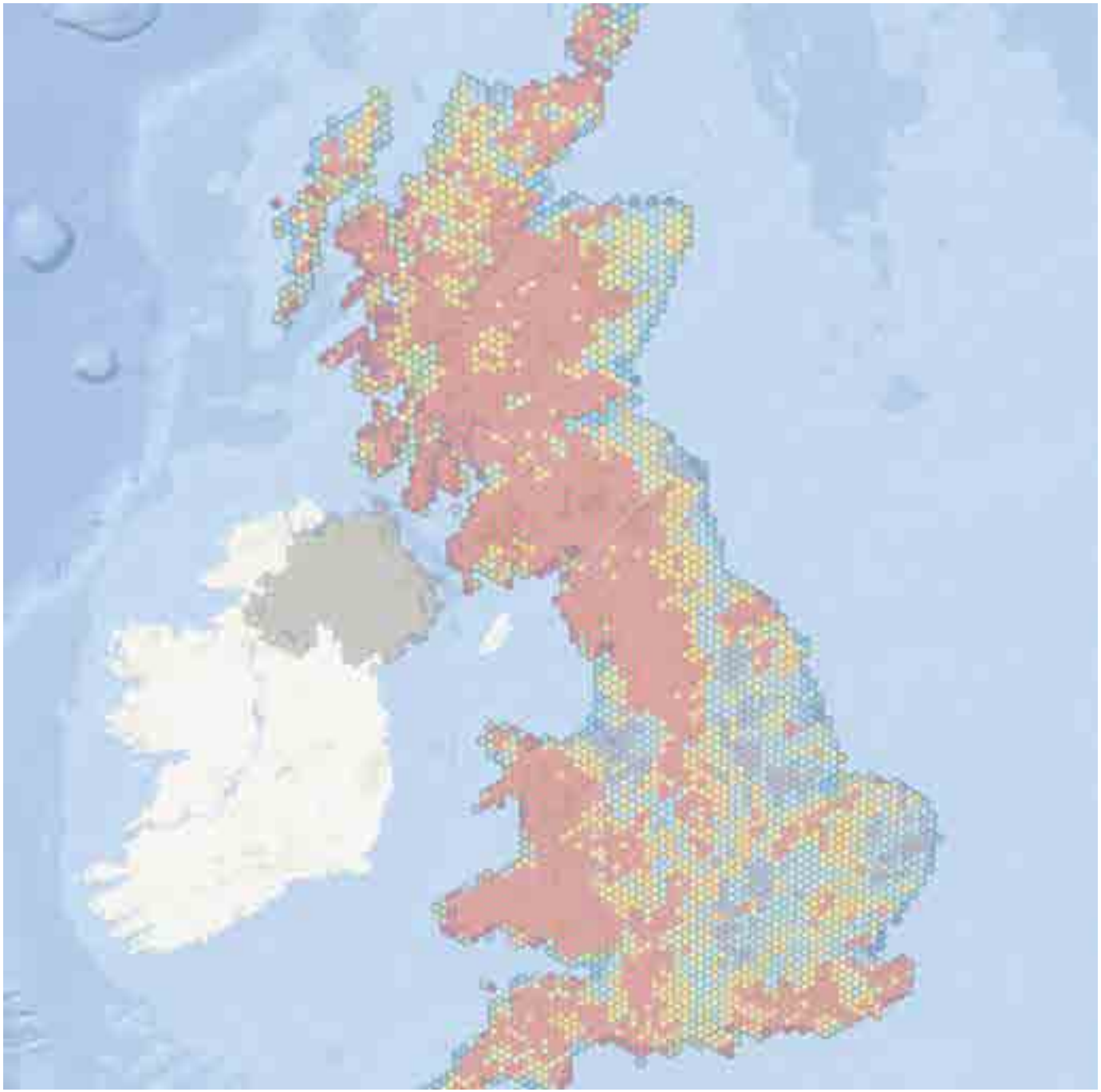
As such, we know we must support and empower our teams who mange the breadth of National Trust places to understand the risks they are facing, and then decide locally if, when, and how to act. This means we need to build confidence and skills widely, rather than concentrating on just a few places or people.

We don't have all the answers, but we hope that by sharing the story of how we have started on this journey and where we think we're heading, that we can support others to take similar steps.

## Identifying where we need to adapt

Adapting to the impacts of climate change starts with seeking to understand, as far as we can, how future climate trends may affect the different places in our care.

To begin to answer this question, we've worked with partners to develop our 'Hazard Map'.[5] Working to a 'worst-case scenario' model, where emissions continue unchecked at their current levels until 2060, the map plots places in the UK alongside data which models changing climate trends, flagging potential risks including extreme heat, humidity, landslides, high winds and floods. The map was the first of its kind when launched in 2021, and it's being improved all the time, with 40 new risk layers that have recently added details like intense rainfall events, drought and storm damage. This marks another significant step in our climate adaptation journey, showing that the per centage of National Trust sites at medium or high risk of climate-related hazards could increase from 30% in 2020 to 71% in 2060.



**Right:** Hazard Map layer showing future risk presented to heritage sites across the UK from slope failure

**But the data from the Hazard Map can only take us so far:** Its a combination of hundreds of years of weather data and trends, all built into a model. But we also need to understand the experience of teams on the ground if we want to build a better picture of what is already changing, alongside the specific vulnerabilities of the objects and places we care for, their local communities and wildlife.

## The 'Adaptation Handrail'

Working with our staff and external expertise the National Trust has developed a property facing approach we are calling the 'Adaptation Handrail':

Our Adaptation Handrail is flexible and is not tied to a specific date or time. This means that local teams can adjust their response to current circumstances, but it also offers concrete, measurable actions, which budget holders and property managers can use to plan for the future with better confidence.

1

**Develop an Impact Assessment,** using the data from the Hazard Map and the experiences of those on the ground, to assess how climate change is having an effect today, and is likely to affect in the future, the places in our care.

2

**Hold workshops with local teams** to establish those risks which may have the most significant impacts. These workshops will:

- Ask what our most difficult choices could look like in future. This might be having to close the site for several days a year due to weather conditions or facing loss due to coastal change.
- Work backwards from the need to make these decisions, assessing whether we could or should avoid having to make this difficult choice, or whether we can only delay or accept.
- Identify the various actions that could be put in place to help avoid or delay an unwanted outcome.
- Identify trigger points that will guide when we might take these additional actions, such as a certain number of days into a drought or after a catastrophic event that damages the land or buildings.

3

Use the Property Observation Tool to **monitor when trigger points are reached.**

4

Once a trigger point is reached, it prompts a discussion about whether we need to take action. We'll **implement the actions** we identified in advance.

## Supporting our people

Equipping our teams with the tools and training they need to adapt is vital. Sharing skills and experience is a big part of how we are moving forwards together, as is developing new ways to support understanding and action. One example is the Property Observation Tool, an app that our teams use to log local climate impacts, helping to monitor changes on the ground and understand when 'trigger points' are reached.

Working with other heritage organisations across the UK and Ireland we are also creating comprehensive Adaptation Guidance, which offers key things to consider, case studies and recommended actions across a wide variety of areas. The guidance looks at a range of different assets and activities associated with historic estates and landscapes. It highlights likely climate threats, and lists options, examples and thresholds for when and how to take action.

In thinking about when to act, we have tested the 'Dynamic Adaptation Policy Pathways (DAPPs) approach. This focuses on identifying specific trigger points (like a certain number of flood events or a certain number of repairs) which might then suggest a set of specific actions (known as a pathway). We have also tested an approach developed by the Climate Action Unit at University College London (UCL), which puts a greater emphasis on human decision-making, working back from asking the question 'what's the most difficult decision we could be forced to make?'

# 4a. Historic buildings and collections

The National Trust cares for more than **28,500 buildings** across England, Wales and Northern Ireland, housing museum collections totalling over one million items. Over the long term climate change is likely to be the biggest threat they face.

The sheer scale and diversity of the heritage we care for is one of our main challenges when thinking about climate adaptation.

## What climate change means for historic buildings

Historic buildings are durable over time but only if they retain their material and structural integrity through regular maintenance and appropriate repair. Many buildings were built for a different climate, which means they may fare less well in drought conditions or intense rainfall and storms. Older, narrower gutters, drainage and lead work, for example, may not be able to cope, with intense rain putting strain on the fabric of the building. The way that our historic buildings are cared for in the context of climate change will not only affect their future conservation as important historic assets. It will also affect their internal environment – for staff, volunteers and visitors, and for collections of precious objects and materials.

When a building's fabric fails, we start to see problems like damp seeping in, which may mean that interiors and collections are threatened, or timbers start to decay.

In extreme cases, flooding, drought and changes in the moisture content of the soil may affect the building's foundations. We're already seeing a need to increase our monitoring, maintenance and repairs to the buildings in our care.

## What we know so far

For a long time, we've been monitoring the internal environment of our buildings. This has given us decades of data on temperature, relative humidity and ultraviolet (UV) radiation, which is a vital baseline for monitoring changing conditions. We're now using the Hazard Maps, Adaptation Guidance and Property Observation Tool (see section four) to build our knowledge and do more to help places to adapt.

## Heavy rainfall

Cragside in Northumberland has had more frequent and intense rainfall as a result of climate change. The house's original drainage system was overwhelmed, and water was finding its way inside this arts and crafts mansion.

Most affected was the drawing room, with its irreplaceable, ornate Victorian inglenook fireplace made of Italian marble. The water was causing the surface and supporting plaster to deteriorate. Work took place to stop water getting into the house and to stabilise and future-proof the fireplace to ensure it's around for years to come.

## Extreme heat

Abnormally dry and hot summers, like we experienced in 2022, not only cause major problems for the landscapes and habitats we care for, but affect built environments too. Some historic buildings aren't designed to regulate heat. This is a problem for historic collections that are sensitive to extreme temperature changes, and it can also have an effect on our staff, volunteers and visitors inside the building. In summer 2022 the temperature inside Chartwell in Kent (Winston Churchill's former home) hit its highest ever at 36°C. While we did not have to close the building on this occasion, we might need to consider future remedial action to cope with extreme heat if, as expected, similar events happen on a more regular basis.

## Unpredictable levels of pests

Data from the Trust's programme of insect pest monitoring for collections care give information on long-term pest trends in our buildings, but it is difficult to identify a climate signal or particular trends in these data at present. Insect pest levels will be affected by climate, but also depend on local factors such as collections care, cleaning and preventive/treatment actions. Pest populations can be subject to quite rapid changes: Webbing Clothes Moth – one of our most common pests – increased by 18 per cent from 2020 to 2021 (possibly because people weren't around during lockdowns), but then fell by 39 per cent from 2021 to 2022. And in 2022, overall pest numbers were down 3 per cent from 2021.

However it is likely that milder winters will cause more year-round pest activity, possibly with new species emerging. Insect pests are one of the hardest threats to plan for, understand and mitigate, which makes finding ways to adapt more of a challenge.

## Improving on previous work

Another significant challenge to how we manage buildings and collections in a changing climate is maladaptation – where previous modifications to a building are now causing harm and worsening the effects of climate change. For example, using non-breathable materials such as cement instead of lime renders for repairs can make the impact of rainfall worse. Non-breathable materials hold water within the building, so switching to lime may help the walls breathe and dry out.

By focusing on the principles of breathable construction, natural materials, and historic character, we aim to avoid future maladaptation by making decisions that are both future-proofed for a changing climate, and appropriate to the special character of the buildings in our care.

## Our approach

While each building or object may need specific treatment, our approach to adapting historic buildings and their collections for climate change is underpinned by three key things:

1. Considering the present and the future (keeping a building stable in the short term while we investigate how we can adapt it for the long term).

2. Understanding the building (its history, its modern-day function and what it needs).

3. Understanding the wider landscape (for example, local climate and geography).

## Considering the present and the future

Good adaptation may mean considering what can be done now to prevent more serious and expensive damage in the future.

Climate impacts aren't always major weather events like extreme heat or flash floods. Sometimes they come in the form of slowly increasing damage, which may require less structural change but benefit from smaller shifts in how we manage buildings day-to-day. Sometimes it can be the 'little and often' actions we take that help avoid major damage to buildings.

One important action that everyone can take is simply keeping buildings in good repair so they're wind and weather-tight. Since 2021 our facilities managers have been helping us to do just that, spotting where the weather is causing damage and taking action before it goes too far. For example, they might discover that the best way to protect a library and its contents isn't to intervene in the actual room, but to start with cleaning the gutters.

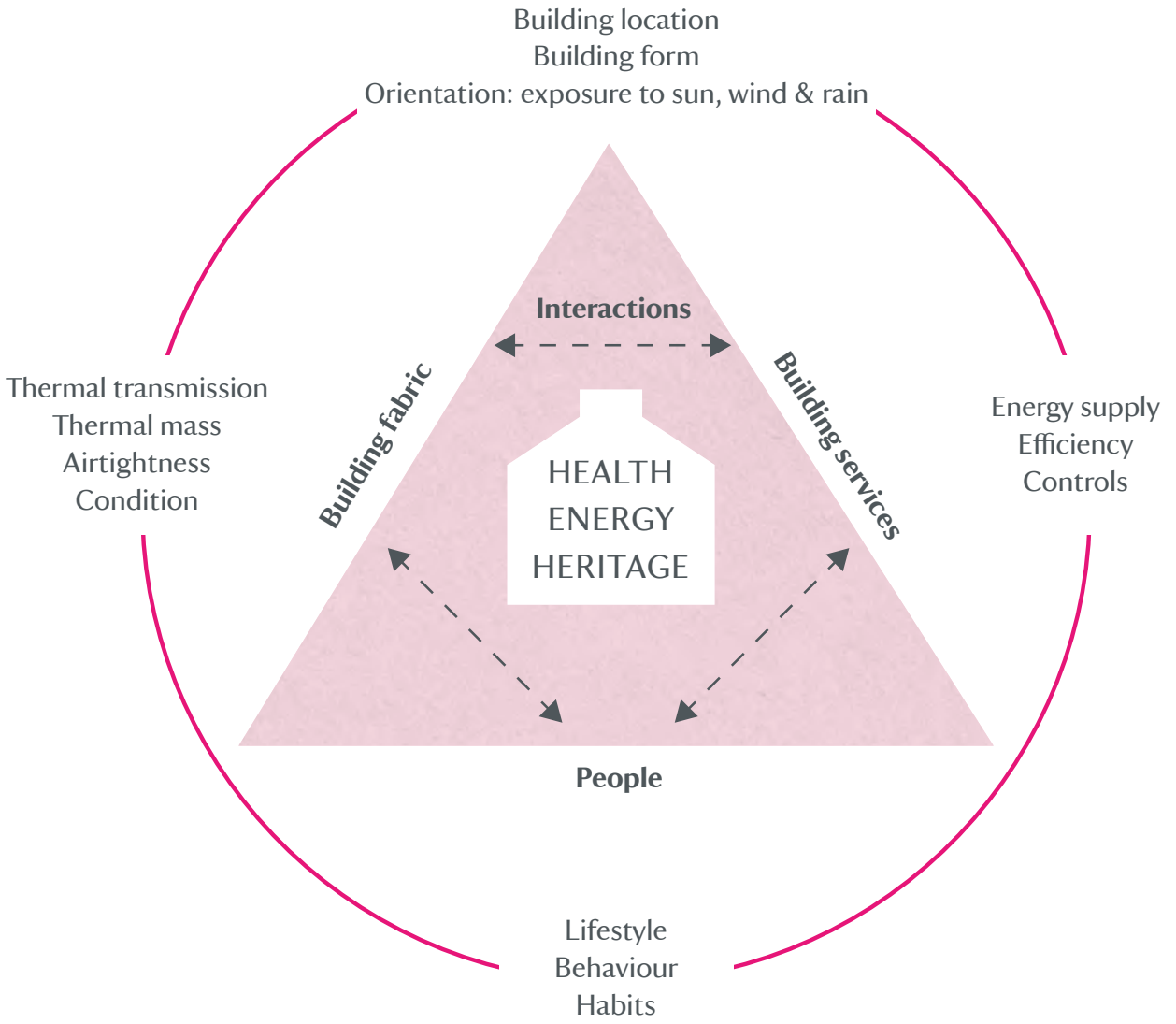
Sometimes regular maintenance isn't enough, and we need to find ways to sensitively adapt a building to keep it safe. This may involve work such as improving weathered material with like-for-like replacements, repointing masonry walls with lime, using higher codes of lead on roofs or adding new ridges and slates to keep a roof secure. We try to make sure these changes are sympathetic to the building's style and era, and draw on the advice and seek consent from regulatory bodies (for example, listed building consent).

## Understanding the building

We can learn a lot from a building or collection's past to protect its future. Every building is different, from factors like location and construction to the way it's maintained and used. We make sound decisions for adaptation by adopting Historic England's 'whole building approach'.[6] This ensures we take into consideration all aspects of a building, from its form, design and building fabric, its services (such as heating), and what we need from it in terms of comfort levels for staff and visitors, or conditions for the collections it houses. This approach means not only using less carbon intensive technologies, but also utilising approaches that are more in tune with natural events, and considerate of historic fabric – allowing buildings and their contents to live and breathe in their contemporary context.

The thick walls of some traditionally constructed buildings have high thermal mass, which can help them keep thermally stable in higher temperatures. Good condition of building fabric contributes to a building's overall thermal performance and energy efficiency. By keeping historic buildings going, we harness their 'embodied energy' and avoid the emissions that would come from demolition and/or reconstruction.

## Whole building approach



## Understanding the wider landscape

As well as considering the building itself, we can also look farther into its landscape context for ways to support its resilience. The National Trust is well placed to take this approach as we often have opportunities to work on our own land, or in partnership on a landscape scale.

For example, at Fountains Abbey in North Yorkshire, regular flooding in the Skell Valley has posed a significant risk to the UK's largest monastic ruin, a UNESCO World Heritage Site. Frequent and serious floods were undermining the structure of the building and archaeology. A partnership between National Trust and other local stakeholders along the River Skell developed a holistic approach to combine heritage and catchment management: we've planted trees, created wetlands and fenced banks to reduce the run-off of soil and slow the flow of the river. This adaptation is helping to protect the abbey and archaeology downstream while also making the river better for nature and wildlife.

## Co-benefits

Managing buildings for both present and future conditions means places can be better prepared for today and tomorrow. As with all maintenance, repairs and adaptation measures, it is almost always the case that acting now means reducing the risk of having to address more serious and more expensive damage in the future. 'A stitch in time' to clear gutters or increase their capacity may prevent more extensive damage from water ingress in the future, such as onset of dry rot. Maintenance and adaptation is therefore likely to be the most preventative and resource efficient choice.

Of course, caring for and adapting the buildings and collections in our care is part of our core charitable purpose. We'll keep monitoring, learning and taking appropriate action so that future generations can enjoy them too.

# Case study: Blickling Hall, Norfolk

**Adapting to more frequent flooding**

When people chose to start building at Blickling in the medieval period, it was probably because of its proximity to the River Bure. Over the centuries, through Blickling's growth to a large estate surrounding a Jacobean house, the river has remained an important part of its character. At one time the Silvergate Stream – a tributary of the River Bure – ran through the walled garden, feeding the nearby lake to provide fresh water to the house and help with waste management. Over time this developed into a more complex water system, with a series of culverts, drains, sewers and chambers installed by the Victorians.

The Hall's connection to the water continues today, but the effect that climate change is having on the river, as well as local rainfall, is making the estate more difficult to manage.

**Right:** Riverlands project, Blickling Estate, Norfolk

## Threats to Blickling Hall

Today, new extremes in both rainfall and drought are threatening the structure of the building. The ornamental parterre garden is flooding to the point where water is being pushed through the brick retaining walls of the moat. If this continues, we predict parts of the moat wall might collapse. In recent years we've also seen the dry moat and basement fully flood and cause damage. The mansion is built on a seam of clay that follows the line of the Silvergate Stream up to the lake. Clay is sensitive to changes in moisture: when it gets very wet it swells and in a drought it shrinks and hardens. We've monitored the building and seen signs of movement, likely caused by the soil's constant state of flux. If this continues, the mansion's external walls could start to crumble.

In addition, the mansion's old gutters were designed in a different climate and can't manage the volume of rainfall that we've seen in recent years. This means rain is penetrating the roofs and walls, allowing additional water into the building.

Finally, in the process of carrying out a major project on the building in 2019, we found severe damage from deathwatch beetles (a woodboring pest) in the Long Gallery. It's most likely the infestation happened because of damp. The team had to replace rotten timbers, secure the Jacobean plaster ceiling, and repair the damaged roof and downpipes. We've also found decay in the Upper Ante and South Drawing Room and had to secure their ceilings. Damp has crept into the Clocktower too, and in the Chinese Bedroom it's led to high numbers of silverfish (insects that thrive on moisture), which might damage the 18th-century handmade Chinese wallpapers.

## What we're doing now

Assessment and understanding are at the heart of the approach we are taking at Blickling. We're doing the following investigations to understand more.

- Historic research to understand the design, location and function of Victorian and earlier drainage systems.
- CCTV surveys across all accessible drainage systems, mapping their locations and condition.
- Hydrology studies to understand how quickly the drainage system floods and where this flooding is likely to happen.
- Monitoring movement in the foundations of the mansion from season to season.
- Monitoring the ground's moisture in the dry moat to see how weather is affecting the clay foundation.

## How we're adapting for the future

We've started to improve the management of water and minimise flooding by:

- Installing a new drain linking to two 8,000-litre water storage tanks, after the garden wall collapsed due to waterlogged soil. This will keep the new wall secure while capturing water to use in the garden.
- Clearing and repairing the culverts that run around the mansion and alongside the lake to make the Victorian water systems more accessible and viable.
- Repairing the sluice and lake wall within the dam of the lake to reduce potential flooding.

## Finding natural solutions to care for heritage

In 2019, we restored the Silvergate Stream, because over several years it had deteriorated into muddy patches and barely flowing water. The project involved re-digging the stream path and introducing a series of measures to trap silt and create natural riffles (shallow areas). We also re-dug channels around an existing reedbed to help it develop, and created a small wet woodland just upstream, which is meant to flood during heavy rainfall and help filter the water before it enters the stream and moves into the lake. Since finishing the project, we've found that flooding in the Hall's basement has noticeably reduced and when it does flood it's on a much smaller scale.

This is an encouraging result that's inspired us to explore further methods of conservation that benefit both nature and heritage.

## What's next?

We're investigating two main ways to further adapt the estate's water management for a changing climate:

- Establishing a new surface water drainage system that works seamlessly with the existing Victorian systems to manage water and reduce damage.
- Redesigning the mansion's rainwater goods (gutters, hoppers, stumps, valleys, downpipes) to a size that can manage more intense rainfall. This will also involve re-directing internal rainwater goods to stop water getting into the building. As part of this, we'll be inspecting and repairing water-damaged roofs.

# Case study: Dyffryn Mymbyr, Eryri (Snowdonia)

**Using traditional methods to adapt for the future**

Dyffryn Mymbyr is a Grade II-listed, 16th-century farmhouse near Capel Curig in Eryri, the second wettest region in the UK. It's been in our care since 2003 and is now a holiday cottage.

When we first started to care for the cottage, it was already showing signs of water damage from rain penetrating the masonry gable wall. Old houses usually get a little wet in the winter and then dry out over summer, but this wasn't happening at Dyffryn Mymbyr. Instead, the cottage was getting damper. Climate change has made wind-driven rain more frequent and severe in this area, which was the root cause of the problem.

Due to its Grade II-listing, we initially tried to keep the rain out by replacing the existing pointing and installing a lead tray. This was the least invasive solution, but it didn't work.

Our experts looked to the traditions of the surrounding area for answers. Learning from the architectural style around Eryri, we installed 'slate hanging' to the entire exposed gable of the building, which directly faces Yr Wyddfa (Snowdon), in the same style as the traditional roof.

Since adding the slate hanging, the rain has stopped penetrating the cottage and the damp is drying out. We've also found an added benefit of hanging slate: it provides an air gap to allow the building to breathe.

When we can look to the past to explore ways to adapt to the future, we can sometimes find answers that allow us to protect historic buildings in more ways than one.

# 4b. Nature

The preservation of natural beauty was a founding principle of the National Trust, over 125 years ago. Today, nature needs our help more than ever.

The UK is facing a biodiversity crisis, meaning we're losing the diversity and abundance of insects, animals and plant species that maintain health and harmony in the natural world. It's happening for a number of reasons, including more intensive farming, building, pollution, pests and diseases and – in extreme cases – major events like flooding and wildfire, all magnified by climate change.

## Biodiversity loss and climate change are linked

Some of the practices that reduce biodiversity are also releasing carbon into the atmosphere. For example, peatlands can be excellent at storing carbon and are home to a diversity of insects and birds. But when they're farmed too intensively, habitats are destroyed (impacting biodiversity), and, at the same time, carbon gets released into the atmosphere.

Nature's decline is made worse by climate change. Pollution from sewage, for example, is more severe during drought or persistent hot weather, as when there's not much water around, the pollutants that remain in the water are much more highly concentrated. Also, hotter summers and more rainfall cause catastrophic events like wildfires or flooding, which can destroy wildlife habitats.

## What we're doing

While the causes of nature decline and climate change can sometimes be linked, so too are some of our positive responses. We know habitats such as woodlands, wetlands and healthy peatlands store carbon. But they also help slow the flow of water on the landscape to reduce flooding and, where it's needed, hold water to lower the risk of wildfires.

A thriving ecosystem is one that can be resilient and flexible, always able to support biodiversity. As with our approach to buildings, we're looking at the bigger picture when thinking about adapting habitats to climate change by making sure we keep ecosystems healthy. This means things like thinking carefully about which species of tree we plant and where, to help them thrive in the wider range of climates we're going to experience. We're also re-wetting peatlands to make sure they're resilient against wildfires while boosting biodiversity.

Dunwich Heath in Suffolk is usually a blanket of purple. Dunwich's heather is essential to the rare Dartford Warbler that nests there and characterises the special landscape that people love.

However, in 2022, the summer's drought, extreme heat and high numbers of a pest, the heather beetle, killed much of the heather.

As such, the team at Dunwich are now thinking about the impacts of future hot weather on lowland heathlands, and how they can help the landscape adapt to climate change, starting with understanding what's causing the heather's decline. In summer 2023, they commissioned an infra-red drone survey, which mapped the scale of the problem and showed that over 60 per cent of the heather on the heath had perished. Guided by the Adaptation Handrail (see section four), the team will now think about what these findings mean for the future of the heath, how they can ensure it continues to work best for nature and for visitors, and whether this means making any changes to how they manage it.

In Wales, there are several threats to rare arctic alpine plant species, including pollution from nitrogen in the air, over-collection during the Victorian era, and years of intensive grazing, as well as accidental disturbance by climbers. But all these problems are made worse by the effects of climate change.

Hotter weather is a major threat to their survival. Arctic alpine plant species are relics from the Ice Age, they thrive only at high altitudes in Eryri (Snowdonia). As the climate warms, habitats will begin to move northwards and upwards as ecosystems respond to changing conditions and these plants will need to spread to new, higher habitats. While these do exist, they're not joined up to the Arctic alpines' existing habitats due to historic over-grazing.

So as these plants can't reach these new habitats on their own, we're stepping in to help.

Since the 1990s, we've had a grazing agreement with Eryri's farmers to reduce pressure on the land on the mountainside. And more recently, we've worked with the British Mountaineering Council (BMC), National Resources Wales (NRW) and Eryri National Park to install thermometers so climbers can find out when they're at the visitor centre, and online, whether they can climb without disturbing arctic alpine plant communities such as the purple saxifrage and Snowdon lily. We're also part of a landscape-wide trial – led by NRW and Plantlife – to collect arctic alpine seeds such as tufted saxifrage, propagate them in a nursery, and re-establish them in the higher habitats that they wouldn't otherwise be able to reach.

We can only tackle the biodiversity crisis by finding ways to build flexibility and resilience into all our nature restoration work. Natural landscapes are constantly shifting and increasingly climate change is one of those shifts we need to account for.

# Case study: Darnbrook Farm, Yorkshire Dales

**Working with farmers to adapt the land**

Darnbrook Farm is a large hill farm, covering over a thousand hectares, which currently supports a suckler herd of mostly native breed cattle, and a large sheep flock. We've been working with the tenant farmer, James Hall, to ensure the farm is working for nature and can adapt to climate change.

**Right:** Darnbrook Farm, Yorkshire Dales

## Restoring peatlands

Part of the farmland is peat bog, which has become damaged by historic drainage and over-grazing. Recently, however, James has reduced or stopped grazing on the peat and work has been undertaken with Yorkshire Peat Partnership to re-wet the bog by installing blockages in drainage channels where they are needed and also to reconstruct collapsed peat to prevent erosion. Now that this restoration process is well underway, crucial species including the water beetle, red grouse, golden plover, dunlin and merlin are thriving, along with vegetation such as the cloudberry. We also think the restored peatland is beginning to heal, which will enable it to continue to store carbon and hold more water in the landscape in times of drought or intense rain to minimise damage to the farm and communities downstream.

## Planting woodlands

We've also worked with James to plant new gill (steep, narrow river valley) woodlands on the farmland, establishing approximately 75,000 trees and shrubs – mostly birch, willow, hawthorn, alder, rowan, bird cherry and oak – between 2008 and 2016. Gill woodland is found in the extreme upper reaches of rivers and creates a unique microclimate where springs and streams first form in steep wooded valleys. The coarser vegetation and tree roots of the gill woodland will help to absorb rainfall and hold water in the landscape for longer to reduce the effects of drought and flood. We've also agreed to create new areas of wood pasture on the farm, creating new habitats and providing shade for livestock as we experience more hotter summers.

## Planning for the future

The next step is to think about how the farm's livestock systems can adapt, so we will shortly trial a different farming system, where stocking levels (the numbers of livestock in an area) are reduced. Our shared hope is that this will reduce the amount of compacted soil and slow the flow of water in the landscape, keeping James's business resilient for the future. Reduced grazing will also in time increase species diversity in the grassland.

Seeing the success of this work at Darnbrook Farm has made us think about what else we can do for the land we care for. We're using the data from the climate Hazard Map (see section four) – as well as other local predictions and data from a monitoring station on the nearby Malham Tarn – to understand the challenges and opportunities.

## Sharing what we've learned

To share this data, we're running workshops with local farmers. Here, we can learn from their experience and identify routes forward together. Recently, for example, a small number of tenant farmers and National Trust staff took part in a one-day workshop in partnership with University College London. They explored the impacts that climate change is having on farming in the Yorkshire Dales, discussing changes already underway, challenges for farming, and possible current and long-term responses. People shared their observations of how the land they know and work on has been changing over time.

After the workshop, **Bill Cowperthwaite** from Tennant Gill Farm, said:

> As I do not attend these sorts of events very often, I was a little dubious as to how it would go. I actually found the day very enjoyable, interesting and thought provoking. It has started to make me think longer-term about the potential impacts of climate change on the farm and livestock. Although we are only a tiny drop in the ocean as such, we all need to do our bit to help.

**Right:** Ranger at Malhamdale, Darnbrook Farm

# Testimonial: Dewi Roberts,

## Lead Ranger at Carneddau

“I’ve worked as a Lead Ranger for the Trust in the Carneddau mountain range for over 20 years. The Carneddau is part of Eryri (Snowdonia), and lies at the northern end of Eryri National Park. There are nine tenanted farms and 10,000 acres of Common land, it also has the first designated Nature Reserve in Wales - Cwm Idwal.

During my time working on this mountainous landscape, I’ve seen some notable changes to the weather patterns. This part of the country is renowned for its heavy rainfall, but more recently we’ve experienced more extreme persistent downpours. They’ve been so intense they’ve caused several landslides within a few hours. One day in August 2020 we had six individual landslides in the Ogwen Valley. Some caused road closures, others damaged walls, tracks and fences. Over the last year we’ve been working with the local councils and the Welsh government to look at the land adjacent to main roads and infrastructure, to see what we can do to mitigate future landslides or rock falls.

Our plan is to survey the valleys where previous landslides have occurred to see if it’s possible to plant native broadleaf trees in order to stabilize the slopes. We will also be looking at current water courses and to see if any changes have happened to these channels over the years.

Higher up in the hills we will look at upland bogs where in previous years ditches were opened to improve the land for agriculture. Working with our farmers and neighbours we are looking to block these ditches where possible to slow the flow of water running down to the valleys below. This in turn will re-wet the peat, storing carbon in the process.”

# 5. What are we hoping to achieve?

When we began our adaptation journey, our objective was that every decision taken across the organisation would consider climate resilience. This is still our objective, but we now know more clearly what that journey will look like.

In practice, a climate-adapted National Trust is flexible and able to continue to deliver our core purpose for people in the face of unexpected weather and new challenges. But we will also need to considered and have a plan in place, so that communities can have some certainty of the direction we're going and have a say in the decisions we make.

Crucially, we'll be led by our people. Every change that we make to adapt to climate change will have our staff, tenants, volunteers, visitors, and local community in mind. It'll be tailored to the individual circumstances of each property, community and habitat.

Adapting the National Trust to a changing climate isn't about overhauling the organisation – we're still doing what our founders set out to do and caring for nature, beauty and history. Instead, it is about making sure that the Trust is here in another 128 years' time, fulfilling the same purpose and continuing to care for some of our most beautiful, historic, and nature-rich places.

In doing so, we can draw on the past to inform our approach to today and tomorrow.

> Conservation is not about stopping change, but about breathing new life into old spaces while retaining the elements that make them so special.

Adapting to climate change is another – albeit larger – challenge among several that will shape Trust places in the coming years. We know that by making these changes now, the National Trust of the future will be better able to look after the important places in its care.

# 5a. Gardens and parklands

We care for more than 220 gardens and parklands. Together they make up one of the largest plant collections in the world and represent over 500 years of horticultural history. As living time capsules, these gardens are home to rare plants and nature, and provide millions of people with space to meet, play and relax.

Climate change is already having a negative impact on the health of trees and many traditional garden plants. It's also changing the timings of activities such as mowing, which is now required year-round in many places, and planting, which is increasingly difficult in spring droughts. High temperatures are creating unpleasant or unhealthy working conditions for garden staff, while increases in flooding and storms mean we're having to close gardens to visitors more regularly.

We're now in the process of assessing how climate change is likely to affect Trust gardens, developing plans and thinking about when to put them in place. Different types of gardens – such as rose gardens, annual bedding schemes and formal lawns – will have different needs, so the research and planning will vary. While we're adapting gardens for the future, the changes we make need to be rooted in – and respectful of – the history of each space, reflecting the visions of past gardeners. The aim, above all, is to ensure the spaces we create continue to deliver their multiple functions, as homes to special plants, horticultural history and local communities.

## What we're doing

We're investing in rainwater collection and storage so that we can limit use of mains water (which we'll need to reserve for human consumption). At Ham House in London, for example, where there is now a 10–25 per cent chance of a heatwave each year compared to a 10 per cent chance a decade ago, we are exploring the restoration of the Victorian water-harvesting and irrigation system. The historic system is designed to collect rainfall from the house guttering in water chambers that can be used to water the garden.

We're also investing in better composting facilities for gardens to allow for more frequent mulching of soils. This will reduce moisture loss from new plantings and improve the moisture-holding capacity of soils. Advice for garden teams is in place to keep water usage only for the most vulnerable or special plants and to explore changes to more drought-tolerant planting schemes.

Where we create new garden features or need to alter existing ones, we're developing sensitive ways to make them more climate resilient, which are rooted in the past. At Sissinghurst, for example, we've reimagined the planting of the Delos Garden to help it withstand drought, while staying true to the 1930s design vision. The garden was designed as a Mediterranean garden by writer and poet Vita Sackville-West in 1935 after her visit to the Greek island of Delos, but the vision was soon lost when the plants didn't thrive in England's climate. Inspired by the spirit of experimentation that guided Vita and her husband Harold Nicolson, we drew on archival research to introduce a new planting scheme typical of Greece and the wider Mediterranean basin, and a gravel mulch, all suited to the hotter, drier summers we're already starting to experience.

We're thinking about how climate change will impact the plant collections we care for. Our Living Collections Curator is cataloguing the most significant plants and assessing whether they're unique to that garden or our collections, or rare to horticulture more widely. Some of the plants in our care are now threatened in the wild in their countries of origin. By understanding their context we'll be able to respond effectively as climate change begins to affect them. We'll propagate and relocate the most significant species to safe, alternative locations and find different species to live in Trust spaces if necessary. To support this work the team from Sheffield Park – which contains one of the most precious woody plant collections in our care – recently visited Kew to receive guidance around their approach to managing change for an important cultivated plant collection. The team at Kew are now supporting Sheffield Park's planning process.

At Penrhyn Castle in Bangor, Gwynedd, analysis suggests that by 2080 the castle might be experiencing weather patterns similar to those in South East England or Northern Spain. This changing climate will be most noticeable in the sheltered walled garden. If we don't make changes, the water-hungry plants that are currently grown here will require repeated watering in high-heat conditions and many will likely die during drought. So, the Penrhyn team have come up with the alternative solution of creating a new, Mediterranean-style planting scheme within the walls, which will withstand hotter, drier weather.

## Improvements for visitors

National Trust gardens are spaces where people can play, learn, and connect with nature, and it's important that we keep them healthy and welcoming. Part of this is ensuring that there are areas of shade in the increasingly frequent hot weather.

We also need to adapt garden paths for a changing climate. In several places, grassy paths aren't withstanding the wear in prolonged winter wet or summer drought, and in others, loose surfaces are being washed out in high rains and floods. In some cases, we're able to replace these with new hard paths or bonded surfaces (which also may provide better access to those with limited mobility), but the right approach will vary from place to place.

Ultimately, we're working with the gardens in our care to help them – and the precious plant species they're home to – adapt to the changing climate and remain welcoming, peaceful escapes for people to explore and enjoy.

# Case study: Mount Stewart, County Down

Mount Stewart is an environmentally remarkable place. It sits on the east shore of Strangford Lough, which is the largest sea inlet in the British Isles and Northern Ireland's most protected nature conservation site.

## Protection from the elements

It's clear that Mount Stewart's residents have always had a good understanding of the area's environmental factors. In the early 19th century, the estate's 'sea plantation' was created. Acting as a buffer against the winds coming off Strangford Lough, the sea plantation shelters the area close to the house and allowed for the creation of the current garden and plant collection.

But this isn't quite enough to shield the garden from the effects of climate change, and the sea plantation will at some point be overwhelmed. Warmer summers, wetter winters and rising sea levels are altering the site and what can be grown. Modelling suggests, by 2080, sea levels in the area could rise by 60cm, increasing to 95cm with storm swells and nearly 3.5m during the most severe storms.

**Right:** A view from the Temple of the Wind across to the plantation

## Changes threatening Mount Stewart

For Mount Stewart, this means that the coastal gardens areas will face an increasing amount of water coming in (in the form of groundwater), and the sea plantation will see much more flooding with salt water. At high tide rainwater that currently drains from the gardens out into the lough will also have nowhere to go. It's very likely that the most famous area, the Formal Gardens, will be consumed slowly by both salt and rainwater sometime in the next 100 years.

The team at Mount Stewart are now among the first in the Trust to take on the process of assessing the risks posed by climate change and to work through detailed plans for the future. This includes working with partners at Atkins and the Kassandra Project (a climate change decision-making platform) to understand localised climate impacts, and with the University of Bristol to install weather trackers in the garden.

As well as gathering evidence, the team are now making plans for Mount Stewart's future. In the long term, increasing coastal defences is not sustainable. Instead, we'll manage a slow and phased retreat of the garden further into the interior of the estate, with decisions taken at certain trigger points, such as storm events.

## What's next?

The team will continue to maintain – but not increase – the historic armoury around the sea plantation until it fails. This buys time against the flooding of the sea plantation, which will impact on the resilience of the gardens. Changing the species planted is another way to adapt the gardens, establishing plants that are more resilient to windy and salty conditions. The new planting will include a mix of native plants as well as fast-growing, adaptive plant species from Chile, South Africa, New Zealand, and the eastern seaboard of the USA.

The team has also developed a plan called the Ark Project. It'll involve gradually creating a new garden in the spirit of the existing formal gardens but in a safer place, further into the interior of the estate. This way, people will be able to carry on enjoying the garden they love, and any significant plants in the wider garden which are unlikely to survive on lower ground can be propagated and relocated to the new location.

This might seem very different from the current layout, but the new site of the garden will in some ways be closer to the original vision of the Stewart family. Records show they had originally planned to build the house at the top of the estate's main hill, but they ran out of money during the building process. By moving the formal gardens up to this location, the team will be making them more resilient for the future while keeping their character alive for future generations and fulfilling a once-held Stewart family vision.

# Testimonial: Wimpole, Cambridgeshire

For many years, the 1.3-acre parterre has been a popular feature of the Grade I-listed landscape at Wimpole.

Formal parterres like this are edged with box hedging and planted up with annuals and bulbs twice a year, meaning they are demanding of staff time, water and maintenance. In recent years management of the parterre has become increasingly difficult as plants are put under stress from new pests and disease and from the extreme weather conditions that are becoming more prevalent in East Anglia.

The Trust has recently announced that it will work with the Sustainable Landscape Foundation to make the parterre more environmentally sustainable, climate resilient and biodiverse, while offering visitors a longer period of colour and interest.

The new planting scheme will be designed to withstand significant temperature changes, be suited to the soil type, require less watering and have a lower carbon footprint because of the use of longer-lived plants. It will also be designed to support a greater range of wildlife, particularly pollinating insects.

**Tom Fradd, Head Gardener**

Tom said:

“Wimpole experiences huge fluctuations of temperature: in recent years we have recorded -13°C in winter and 40°C in summer. The parterre site is also very open and exposed to strong winds which dry plants out and can cause temperatures to plummet.

Prolonged periods of wet weather make managing the garden difficult as the clay soil holds moisture, becoming very wet and cold, leading to issues with plant health and turf wear.

Prolonged droughts are equally challenging with turf turning brown, plants under extreme stress and our clay soil prone to baking dry and cracking. In the walled garden we mulch the soil a lot and irrigate with stored rainwater but management of the parterre is a bigger challenge.

There used to be an irrigation system on the parterre to help with establishing bedding plants but we don’t want to reinstate it as we’d be using it almost daily in the droughts we experience today. Instead, we want to adapt the planting to species which will tolerate the extremes.”

# 5b. Water in the landscape

Periods of flash flooding or extensive drought are already having an immediate impact on the landscapes we care for, but there are longer-term impacts too. In some places, an increase in intensive rainfall can move greater volumes of sediment downriver, blocking streams and bridges over time and making floods more severe. In other places, limited rain over longer periods lowers river flows, eventually concentrating pollution in the landscape.

## What we're doing

We're responding to these challenges by improving our flood barriers and water storage infrastructure, but also by making better use of nature-based solutions. This means turning to nature to help us adapt to climate change in a way that also improves biodiversity. One example of a nature-based solution is planting trees alongside rivers to stabilise the riverbank, store carbon, create new habitats, and most crucially keep water in the landscape for longer, reducing the chance of flooding or drought in the area.

In the Skell Valley, we've been working with Nidderdale Area of Outstanding Natural Beauty to support farmers upstream on the River Skell to apply natural flood management measures. These include tree planting to reduce surface water run-off, building woody debris to create new habitats for local wildlife, but also provide benefits downstream as natural defences to reduce the effects of flooding. And as the valley is likely to see a substantial increase in the volume of rain over the coming years, this is an essential project.

Innovative river restoration techniques are being piloted globally, and we're thinking about how we can apply them to the land we care for. Historically, rivers and water bodies were viewed as static, and many of the rivers and streams flowing through National Trust landscapes have been drained or straightened to make agriculture easier. Early river restoration focused on adding meanders back into rivers and this is still a technique we use, but we now know that the most resilient technique is simply to remove the constraints around rivers and give them the opportunity to choose their own path.

Both techniques result in a more meandering course, slowing the flow of water to keep it in the landscape for longer, as well as creating new wetland habitats. However, by freeing the river and removing constraints, rather than directing the river in a specific channel, we are allowing the river space to adjust itself in response to prevailing conditions. This approach is better suited to the highly unpredictable challenges presented by climate change and creates more space for water levels to rise and fall.

## Working with nature

We recently completed a project at Holnicote in Devon to 'reset' the river to its natural state. It involved filling a 3/4-mile (1.2km) stretch of the river – which had been straightened and deepened to drain the surrounding land – with 4,000 tonnes of earth to create a seven-hectare area of wetland.

This new waterscape gives the river freedom to react to flooding in a natural way. We've also created lowland meadow, wood pasture and wildflower meadows, and planted 250kg of floodplain wildflower seeds, including wild carrot, devil's bit scabious and meadowsweet. We've added 700 tonnes of important 'deadwood' habitat to the landscape, which 40% of UK wildlife depends on. The local community and volunteers have planted 25,000 wetland trees including willow, bird cherry and black poplar, which will both store carbon and introduce new habitats.

Ultimately, water is the lifeblood of our landscapes, but climate change will dramatically alter how it behaves. We're using nature to combat these changes, trusting the natural meandering courses of rivers, the underground structure of trees, and the sponges of healthy peatlands to adapt accordingly. Working with nature will create more resilient landscapes, support more sustainable business, protect historic treasures and communities and create new habitats.

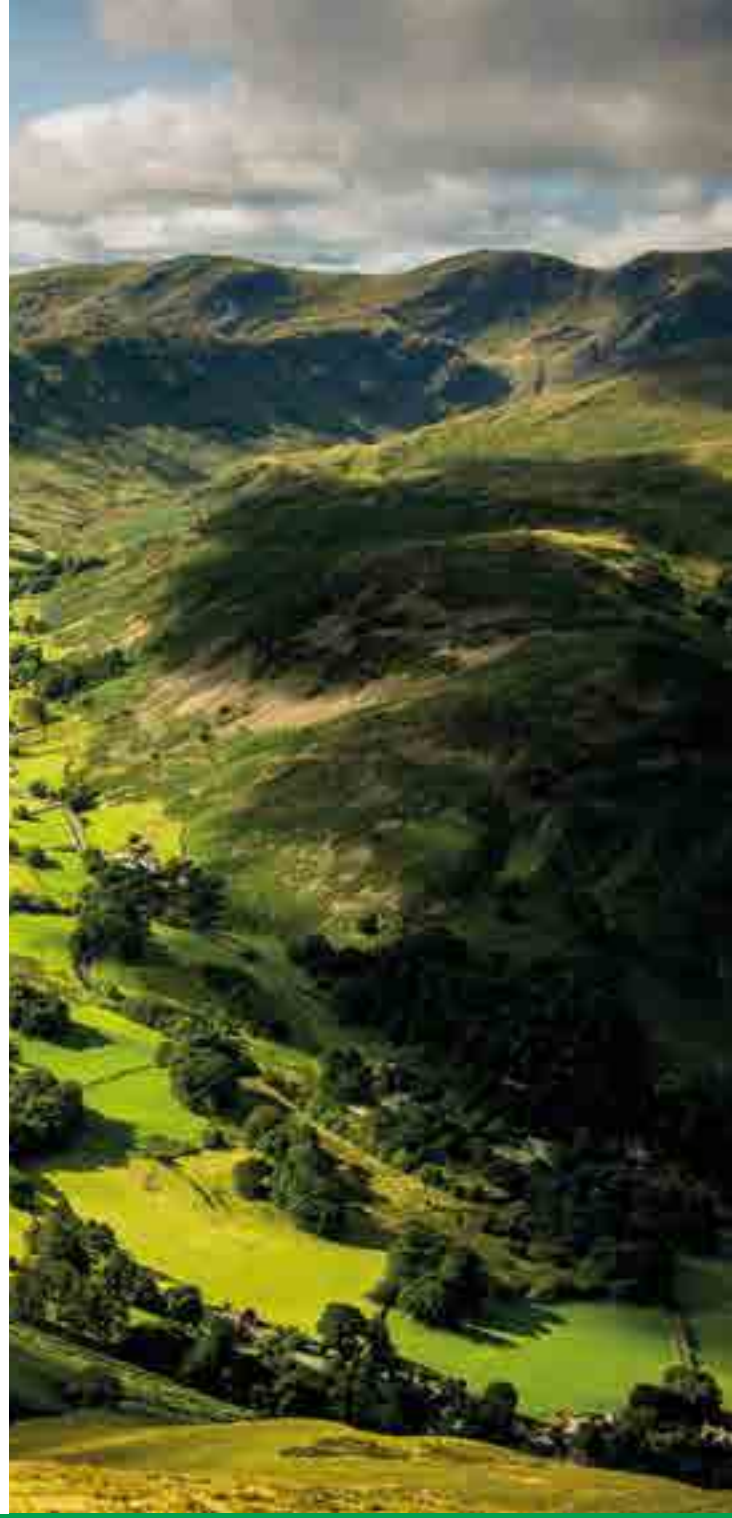
# Case Study: Goldrill Beck, Lake District

The Lake District is a cultural landscape, and one of the stories it tells is of a battle between land and water.

As such, most of the rivers throughout Cumbria have been modified to make space for agriculture, flowing in straightened channels, blocked from their floodplain by embankments. This means the landscape isn't as resilient as it could be to more heavy rainfall, which sweeps large amounts of water and sediment rapidly down the rivers to nearby communities.

Goldrill Beck, in common with a majority of Lake District rivers, had been modified, constrained and embanked at intervals over many centuries. These interventions, along with more recent cycles of gravel removal, had stripped back the river's natural processes, and separated it from its natural floodplain.

Storm Desmond hit the area hard in 2015. It flooded 7,465 homes, and roads had to close in 107 locations, with more than 220 miles of highway damaged. There was significant concern about Goldrill Beck, which runs parallel to the A592, the only road through the valley. The local authority had been making continuous repairs to the wall of the beck (which was suffering from erosion), but the relentless force of the river as a small, straight channel meant that every flood was threatening to wash away this key transport link.



## Responding to damage

As we've found with most climate adaptation techniques, there's rarely a one-size-fits-all approach. Through collaboration with expert bodies, we decided the best solution was to 're-meander' the river through the floodplain, giving the beck the opportunity to open up to its preferred course, while still keeping control of the river above and below the floodplain to avoid disturbing the surrounding area.

We restored ditches, created ponds and removed artificial watercourses. The new channel was connected in 2021 and, as the water trickled down its new course, the natural shape of the river came to light. It connected the river fully to its surrounding floodplain to let natural processes carry on without interruption.

The following two winters showed us the results. Analysis shows the restoration has slowed the flood peak, buying nearby communities much more time to prepare when a flood is coming. Plus, the work has prevented damage by storing 2,170$^{m3}$ of coarse sediment rather than washing it downstream where it would have added to flooding pressures.

## Recovering with nature

The work at Goldrill Beck has created 24,600 square metres of new wetland, where river and floodplain are connected. The floodplain is now home to otters, dippers and wading birds, and an expanse of herb and sedge vegetation. Rangers have also planted 16 black poplars on site, a rare species of tree that thrives in wet environments. This harmony between land and water has created a thriving environment for both people and nature.

# Testimonial: Bede Mullen,

## Chair & Safeguarding Officer, Slow The Flow

"There is a long history of flooding in the Calder Valley, and its effects are devastating. Homes and businesses ruined, possessions and equipment lost, and life interrupted by the power of nature. With climate change, the intensity and frequency of flood events are increasing: what used to be a once-a-century event is becoming a once-a-decade one.

What to do about it? A group of residents got together after the major flood of Boxing Day 2015 to establish a community group, Slow The Flow, with the intention of building natural flood management into the Calder catchment. Working with the National Trust at Hardcastle Crags, we have installed over a thousand debris leaky woody dams, as well as multiple other natural flood management interventions, such as 100s of metres of stuffed gullies, logs placed along the contour of the land and building attenuating ponds. All with the purpose of slowing the flow of water entering the river system.

We have continued this work every other weekend since 2016, except during the time of Covid restrictions. Over a thousand volunteers have worked with us, Slow The Flow trustees and the National Trust rangers on this project. It has caught the imagination of the local community and provides reassurance that the issue of flooding in the Calder Valley is being addressed by the community. This is an example of community resistance and community persistence in practice."

# 6.

# Recommendations

## What actions will the National Trust take?

We'll continue to look after nature, beauty and history by embedding climate resilience and adaptative measures in all areas of the Trust's work.

We'll future proof our projects and programmes, to face into an uncertain climate future.

We'll work with all Trust places and teams to understand the impacts they are already seeing and plan for the changes we expect climate change to bring.

We'll commit to using our voice to ensure climate change adaptation across England, Wales and Northern Ireland gets the attention it needs.

**Left:** Pennryhn: Visitors at Penrhyn Castle and Garden, Gwynedd, Wales

## Why we must work together

Climate change is a challenge to the whole of society. Isolated action by communities, organisations, landowners and governments won't be enough to ease the effects of climate change. We all need to work together and the National Trust is committed to doing so wherever we can.

Governments across the UK also however have a critical role to play to ensure that we're set up effectively as a society for the coming changes. A recent survey found that 57% of the UK public believed the government should immediately take proactive steps to respond to the threats of climate change, and a further 22% thought they should take steps soon.

But action and support from governments is lagging behind. In 2021 the Climate Change Committee (CCC) found of the UK government that 'the gap between the level of risk we face and the level of adaptation underway has widened. Adaptation action has failed to keep pace with the worsening reality of climate risk'. However in the 2023 Progress Report they said England remained 'strikingly underprepared'. While the UK Government itself acknowledged in 2022 that 'we must do more to build climate change into any decisions that have long-term effects'.

The Welsh Government's new national climate resilience strategy is due for publication in autumn 2024, following 2019's Prosperity for All: A Climate Conscious Wales. In its recent independent progress report for Wales, the CCC advised the next national adaptation plan must go further to drive delivery across the public sector and more widely, and that the Welsh Government should embed adaptation into its plans for net zero, future well-being and increasing biodiversity.

We welcomed the introduction of Northern Ireland's Climate Change Act in 2022, which is largely focussed upon reducing emissions and includes nature-based solutions, a just transition, and a Climate Commissioner. Northern Ireland's first Climate Action Plan will follow the Act, setting out the policies and proposals designed to meet the first carbon budget, with subsequent plans eventually leading to net zero. But action on adaptation remains limited and there is a clear legislative gap here.

In 2023 the CCC also reported that "Planning for climate change in Northern Ireland remains at an early stage: most of the critical policy and planning milestones for adaptation are not in place; there is limited evidence of delivery; and there are unacceptably large data gaps in key areas."

## What do we need from governments?

To drive action and speed up progress, adaptation needs to be nested at the heart of policy making in all nations. Specific actions will look different within the context of each nation of the UK. Later in this section, we've set some detailed recommendations for specific steps that can be taken in England, Wales and Northern Ireland. But first, we have identified some common factors that we believe need to be in place across all nations.

### 1 Effective legal frameworks, targets and duties for climate adaptation

Clear legal targets and governance arrangements have been essential in driving action on climate mitigation. The Climate Change Act 2008 set a UK-wide target for reducing emissions, which in 2019 became the UK Net Zero Target. This target is not a panacea: action to mitigate climate emissions is still not being taken at the scale we need. However, it has been a galvanising force for climate change mitigation, and has provided the basis on which to create strategies and pathways that can be assessed against a specific desired outcome. Statutory targets allow governments to be held to account where their plans fall short, and the Climate Change Act 2008 also established a landscape of institutions, duties and responsibilities that support action in practice.

The approach varies across the UK. For example, in Wales, the 2050 net zero target is also embedded within the Environment (Wales) Act 2016 which provides a legal framework for managing the country's natural resources, including the resilience of ecosystems and the ability to adapt to climate change. The Well-being of Future Generations (Wales) Act 2015 also guides policy development and decision-making, and aims to improve the social, economic, environmental and cultural well-being of Wales by setting 7 well-being goals and a duty on public bodies to work towards them.

However, there is a growing gap in legal frameworks for climate adaptation in other parts of the UK that is limiting focus and action on adaptation across policy and decision-making. We would like the UK government to **consider introducing a new Climate Resilience Bill in Westminster that can provide a clearer legal framework around climate adaptation** in England and Northern Ireland.

Effective cross-border cooperation between governments at all levels in the UK and the island of Ireland will be vital to increasing climate resilience. We also need to ensure that citizens have a say in decisions about how to adapt that will affect them and their communities. We'd like all governments to consider ways that communities can join in and contribute to making policy locally and nationally.

**It's time to put adaptation on an equal footing with climate mitigation, with the right legislation, institutional oversight and duties on ministers and public bodies to ensure action on adaptation is being taken across the UK.**

### 2 Climate-responsive local planning frameworks and greater collaboration between public bodies

We support the CCC's call for **planning systems which drive future climate resilience** at all levels. All nations need strong local planning frameworks and policies that fully embed assessments of climate related risks, such as flooding, erosion, overheating and wildfires into decision-making, and promote more and better green and blue infrastructure in towns and cities to grow resilience in urban areas.

We also support the CCC's call for land use frameworks to "address the trade-offs and co-benefits of multifunctional landscapes to benefit climate mitigation, adaptation, food security, nature recovery, timber, recreation and rural livelihoods" and enable strategic approaches to land use: this will be vital to enable nations to deliver against statutory targets for climate adaptation alongside these other vital outputs from land.

All nations need strong policies and protections in place to prevent harm to heritage and nature and those that exist should not be weakened.

However, the need to evolve with a changing climate will require some fresh thinking on how the decision- making frameworks are applied in future in some contexts.

For example, making it easier for us to evolve how we are managing at Sites or Areas of Specific Scientific Interest (SSSIs/ASSIs) could result in more resilient biodiversity in a changing climate. Similarly, we may be able to extend the life of a historic structure by making appropriate changes in the face of new risks. A more adaptive approach to designations, and decision making, could help to address challenges like these.

We believe greater collaboration between regulatory and advisory bodies for heritage and nature in all three nations is needed to help align outcomes and ensure a consistency of approach. **Increased resourcing and expertise within local authorities and arms-length bodies must also play a crucial role in facilitating this flexibility.**

## 3 Policy and funding to help key sectors adapt and deliver change

All national governments need to ensure that funding and support is in place to help sectors most likely to be severely affected by climate change and enable those who can make meaningful contributions to be able to do so. In all nations this will include:

- **Ensuring that agricultural funding schemes are designed to properly reward farmers and land managers for delivering public goods,** including climate adaptation measures that respond to present and possible future risks and take action to support heritage and nature's recovery.

- **Making funding and support available for nature-based adaptation,** including multi-year nature projects to support long-term goals. This needs to be accompanied by robust policies and strategies to restore and protect nature which take into account our changing climate and deliver connected networks of wild places, green corridors and wetlands: building climate resilience into the landscape and strengthening ecological links.

- **Providing more support for the tourism sector** to understand and prepare for future risks and opportunities, enable businesses to make climate-informed decisions, and ensure national tourism bodies have the resource and capacity to support this effort.

- **Ensuring private businesses have access to the finance they need to adapt their premises and ways of working for the future.** In line with the recommendations of the CCC, we're calling on UK public financial institutions (such as the UK Infrastructure Bank, British Business Bank, UK Export Finance, and British International Investment) to develop finance strategies that can ensure every viable UK climate adaptation project gets the finance or insurance it needs.

- **Investment in capacity building and expertise for the green jobs of the future**, ensuring key economic sectors possess the necessary skills and leadership to make climate informed decisions.

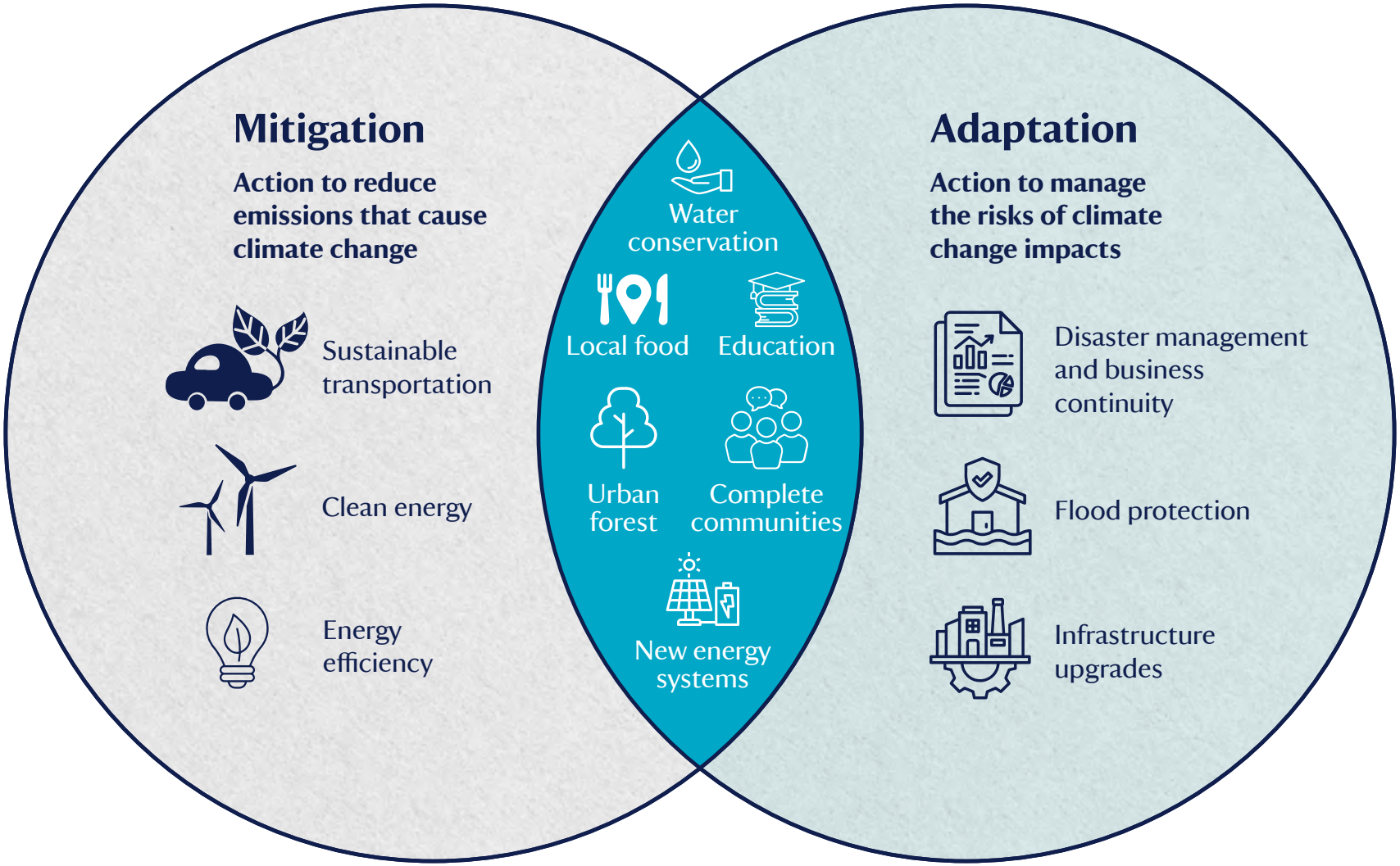
## 4 Investment in better data and research

Data and insight are essential to help us plan for the future. We've spent a lot of time looking at existing research to understand the changes we might see at places we care for. But this becomes difficult when data from different research projects doesn't align. To save time and money, we're asking research organisations to collaborate, so that their outputs can be layered and compared. To encourage this, **we support the creation of one or several adaptation observatories to monitor our changing climate as it develops.**

We know there's more to learn, but it's also important that policy makers don't use a lack of research as a reason not to act. While we welcome the additional funding announced alongside the Third National Adaptation Programme to research the impacts of climate change, we believe that we know enough already to begin to take action. We need leaders at every level to drive the changes we can make now and set in place the systems, policies and frameworks that will create the conditions for the right approach into the future.

## Mitigation + Adaptation:

Balancing actions for climate mitigation and adaptation



# 6a. In detail:

## England

In addition to, and in support of the above, we urge the UK government to consider the following specific measures:

- **A Climate Resilience Bill**, to ensure climate adaptation policy gets the attention and action it deserves. This Bill could include:

  » **National targets for adaptation set across the UK**, made law. These would go a long way to driving resource and buy-in across government for climate action. Multiple targets would be needed because climate adaptation needs are so diverse. We suggest the areas where targets could be set should align with risks identified by the CCC.

- **A statutory duty on public bodies to make climate adaptation a key factor in decision-making** across the UK government and into the regions. This could be modelled on the Welsh statutory duty set in the Wellbeing of Future Generations Act, and should apply to financial decisions because while the cost-effectiveness of early intervention for climate adaptation is well proven, it's rarely put into action.

- **A minister for climate adaptation** either within the Cabinet Office or Treasury, and a cross-Cabinet Committee on climate adaptation. These would ensure that climate adaptation is recognised not just as an environmental issue, but as something that will impact across the whole of society.

## Wales

In addition to the themes above, we believe there's a need for:

- **More dedicated climate adaptation resource within Cadw to aid delivery of the** *Historic Environment and Climate Change in Wales Sector Adaptation Plan,* and to support the sector and heritage asset owners in taking climate-informed decisions.

- Implementation of the CCC's recommendations for Welsh Government to **review cultural heritage indicators in the next adaptation programme** to ensure they accurately reflect the way information can be gathered and reported.

- The Welsh Government to **prioritise the introduction of a Nature Positive Bill,** committing to ambitious statutory nature targets and the establishment of an independent environmental governance body for Wales. With one in six species at risk of extinction in Wales, statutory nature targets are critical to supporting the recovery of species and habitats and enhancing the resilience of ecosystems, including their ability to adapt to climate change.

## Northern Ireland

In addition to the themes above, we believe there is a specific need to address the following in Northern Ireland:

- Further legislative changes, including measures to enable:

» **A statutory duty for Northern Irish public bodies to plan for coastal change** and its longer-term impacts upon communities, the environment and infrastructure.

» **Co-operation for climate resilience and adaptation** both across government and on a north-south, east-west basis.

» Expanding the remit of the **Northern Ireland Just Transition Commission and Climate Commissioner to embed climate adaptation at the core of their work**. This will ensure that the emissions-focussed plans are developed with resilience in mind and provide local oversight and championing of adaptation within decision making.

» A **Northern Ireland Environment and Nature Bill** is needed to provide statutory targets for nature recovery, urban green space and an independent environmental governance body. With Northern Ireland being one of the most nature-depleted countries in the world, action and investment are urgently needed to help species and habitat recovery and ensure climate resilience for nature.

- We need to see increased ambition, urgency and cross-departmental collaboration for the next round of Northern Ireland Climate Change Adaptation Programme Planning in 2024.

- **Introduction of a Northern Ireland coastal policy framework** that works with nature, not against it, to help us plan for resilience of communities, environment, and infrastructure at the coast. The current approach to dealing with coastal erosion risk in Northern Ireland is inadequate, particularly in the face of rising sea levels and increasing storminess as a result of climate change.

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[5] The National Trust's Hazard Mapping tool was developed in collaboration with the following partners and consultants: 3keel, Cadw, English Heritage, Historic England, Historic Environment Scotland, National Trust for Scotland, Northern Ireland Department for Community.

[6] Energy Efficiency and Historic Buildings, Historic England. Available here.

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