



Llywodraeth Cymru  
Welsh Government

# Climate Adaptation Strategy for Wales

October 2024

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# Cabinet Secretary foreword

## Huw Irranca-Davies MS

Deputy First Minister and Cabinet Secretary for Climate Change and Rural Affairs



**Climate change is one of the biggest, fastest and most enduring threats humanity faces. Here in Wales, we are already seeing the impacts of climate change with wetter winters, warmer summers and more unpredictable weather patterns. These will continue to become more obvious over the coming years and decades.**

The twin challenges of getting to net zero and adapting to climate change are both equally important and urgent. While often complementary, the steps needed to adapt to our changing climate are not as widely understood as those needed to get us to net zero. This strategy intends to amplify the conversation around adaptation and provide the impetus for us all to grasp the opportunities while protecting our planet.

Wales is our home, and we need to protect it for the benefit of future generations. We know that the increased frequency and intensity of flooding, coastal erosion, storms, heatwaves and droughts have widespread impacts across the whole of Wales, from our coastal cities to the South Wales Valleys to the rural landscapes of Mid and North Wales. Everyone will be affected, and we all need to understand the risks and prepare for the future. We know that the effects of climate change won't be felt evenly across society, with those on low incomes likely to be most impacted. We also need to consider the potential for international impacts to affect supply chains, supplies of goods and materials and competition for limited resources.

There are also important opportunities for us arising from climate change. For example, reduced rainfall in summer could be of benefit to parts of the tourism industry. We need to be ready to exploit the opportunities as well as safeguard ourselves from the threats. We should face the future with confidence and optimism, whilst recognising the significant challenges. This will require effort from us all but there is still time to adapt to climate change, as well as reaching our net zero targets.

We are working towards a Wales that is resilient to the shocks caused by climate change and where we take advantage of the opportunities. We want to protect the health and well-being of all our people. We want our communities to be safe and to thrive no matter where they are based. We want nature and biodiversity to be protected. We want our farmland and rural landscapes to be productive and sustainable. We want people to understand what is changing and to prepare themselves for the future. We want to move to a circular economy which will help to reduce our exposure to supply chain risks. We want to foster strong collaboration between different organisations and communities so that no-one is left behind. We want to support those who may be more exposed to climate risks or who may have less means available to address them.

This strategy sets out what the Welsh Government is doing already, and what we will do in the future, to respond to the changing climate.

On flooding we are committing funding to create better flood defences as well as investing in Nature-based Solutions to flooding. We will publish TAN-15 guidance which will help protect future developments from flooding. The Sustainable Farming Scheme will set out how we can support farmers to continue to grow high-quality food in a sustainable way. We are committed to meeting all statutory and international obligations for nature and biodiversity, including a commitment to protect and effectively manage 30% of our land, freshwater and marine areas, known as the "30 by 30 target". Public Health Wales has published the Health Impact Assessment of climate change in Wales to help organisations assess the risks to health and well-being from climate change.

The Welsh Government has an important role to play in adapting to climate change, but we cannot do this alone. This strategy recognises the important work our delivery partners are also carrying out. The work of communities, voluntary sector organisations, businesses and others will be key to managing climate change. We will be engaging with communities on the topic of adaptation and building adaptation into future Wales Climate Week activities. We will be setting up a new policy forum with experts on climate change to help drive forward this agenda. We will also present further information about how our partners and communities are working to make us all more resilient to climate change.

# 1. Introduction

**This plan marks an important shift in our approach to tackling the risks of climate change and to supporting a country resilient to the effects of extreme and changing weather patterns.**

Climate change ‘adaptation’ is a term used to describe actions taken to address climate risks and increase climate resilience, whereas climate change ‘mitigation’ refers to actions taken to limit further global warming through reductions in greenhouse gas emissions. Both are essential elements of a comprehensive response to tackling the climate and nature emergencies.

The Welsh Government published its second national climate adaptation plan in 2019, [Prosperity for All: A Climate Conscious Wales](#). That five-year plan demonstrated our commitment to tackling the climate emergency and set out the actions being taken by Welsh Government to prepare for and adapt to the risks and impacts arising from climate change. It was a step in a journey, and this new strategy is an important subsequent step.

## This strategy has been directly informed by:

- The Climate Change Committee’s third UK climate risk independent assessment ([CCRA3-IA](#)), published in June 2021.
- Our [progress report on the Prosperity for All: A Climate Conscious Wales](#) plan in December 2022.
- A specially commissioned [independent assessment of progress and future priorities for climate adaptation in Wales](#) in September 2023 from the Climate Change Committee.

These reports highlighted the progress being made and the significant work already happening in Wales across different sectors to address climate-related risks, but they have highlighted the need to improve our approach further and to do more in many areas. The CCC’s 2023 progress report on adaptation in Wales found that there was “insufficient progress in delivery and implementation of adaptation and monitoring is limited. There are some positive examples of good plans in place although this is not consistent across sectors”. Our understanding of the risks, impacts and interdependencies has improved, leading us to take a systems-based approach to tackling climate risk, recognising the interconnectedness of nature with infrastructure, of agriculture with health and so on. Of course, detailing every possible interaction in such a rich system would be impossible. The purpose of this

document is to provide strategic, high-level mapping of these relationships, and to provoke and stimulate understanding and action in every sector.

Creating the resilient future we all need relies on action by all sectors of the economy, and by communities across Wales. This strategy sets out a vision, a framework for that collective action, and proposes a systems-based joined-up approach to tackling the risks and impacts of climate change. It outlines the actions Welsh Government is taking to deliver climate resilience in areas where it has the levers. Our intention is not to duplicate material already available and so we have provided signposts to this detail where relevant. This strategy begins to explore and set out what the roles and responsibilities might look like in different sectors, and calls on different levels of Government (including at UK level), on businesses, on communities and on local authorities, to take action.

We are already seeing the early impacts of a changing climate. The Welsh Government believes that a collective approach is now needed, based on a shared set of values, to ensure a resilient Wales, not just for today, but for our future generations.

This document should be seen as snapshot in time, as we will continue to work to iterate and improve, to learn from the latest evidence and respond to the latest events, working in partnership with others to tackle the shared challenges we all face. We will review and update this strategy within no more than 5 years.



## 2. Climate impacts and cross-cutting issues

### 2.1 Why is this important? – The case for climate adaptation

Climate change is already happening. In 2023-24 Wales experienced the wettest winter since records began. In July 2022, a new maximum daily temperature was recorded in Wales of 37.1°C in Hawarden Airport, Flintshire.

Even if we were able to reach net zero greenhouse gas emissions tomorrow, we would continue to see [further global warming and changes to our climate](#) at least until the 2050s. Winter rainfall is expected to increase by approximately 6% by the 2050s compared to the average in the period 1981-2000, while summer rainfall is expected to decrease by approximately 15% by the 2050s and by between 18% to 26% by the 2080s. Even under low to moderate global warming scenarios sea level for Cardiff is expected to rise by approximately 22-28 cm by the 2050s and by approximately 43-76 cm by the 2080s.

Section 2.3 sets out more information on the climate change projections and associated weather scenarios we will need to take into account in our decision-making and policy development.

In Wales we can expect to experience increasing frequency of extreme heat events and drought, wetter winters, and increased frequency of severe storms and flooding events at all times of year. This, combined with sea level rise, will also mean increased rates of coastal erosion and coastal flooding. All these changes bring significant risks (and some opportunities) with implications for the resilience of people's lives, livelihoods,

health and well-being, and of our communities, businesses, infrastructure, natural resources, and food security.

The impacts of climate change are material to all sectors and policy areas and therefore need to be addressed as an integrated whole. For example, agricultural policies will impact upon nature, health, food security and rural economies. Similarly, there are significant interdependencies between energy, water, and ICT. The interplay between different services that we all rely upon in our daily lives means that there is a risk of cascading impacts – when one system is damaged there can be knock on effects for others, making the impacts unpredictable and potentially severe. We need an approach that helps us understand this cascading effect and to adapt to various future scenarios. This requires us to plan for the future in a way that takes account of climate change and avoids 'lock-in' (where a decision made now could result in an expensive or difficult retrofit solution to be required later e.g., building a business somewhere likely to flood). We may also need to consider trade-offs between different policy objectives in some cases.

We should also be ready to take advantage of opportunities from climate change. New crops could be grown in Wales and we can expect fewer ice days in the winter which may help to reduce associated hazards and accidents. Expansion of salt marshes as a result of sea level rise and saltwater intrusion can have a positive impact on biodiversity in some areas but could also impact upon agricultural land.

There could be some positive impacts on health from milder winters and drier summers, for example if that encourages children to play and more people to exercise outside.

There is a strong economic case for investment in climate adaptation. The costs of responding to damage caused by climate change are likely to be many times higher than the cost of preventative measures. Costs would arise from climate-related impacts upon property, infrastructure, services, natural resources, health and productivity. [One recent study suggests that the costs arising from climate change could be around 7% of UK GDP by 2100](#), but by thinking ahead we can maximise the co-benefits and opportunities from investment.

The negative impacts of climate change are likely to be felt most by those on low incomes, who may be less likely to have the means to make changes to their work and living arrangements, to adapt their homes, or to have household insurance to cover the costs arising from storm damage and flooding. The very young and old, and people with some disabilities or medical conditions may be more vulnerable to extreme weather events such as heatwaves. The social justice aspects of climate change adaptation are considered further in other sections including 2.4, and 5.7 our Adaptation Action Plan for Health and Wellbeing.

Where we live affects how we experience climate impacts. Wales has significant population centres and important infrastructure based around the coast or near rivers, making us vulnerable to the impacts of sea-level rise, coastal erosion and flooding. There are also specific issues in the South Wales Valleys relating to the proximity of communities to disused coal tips, with risks of slippage which could be exacerbated by heavy rainfall caused by climate change. Infrastructure that has been designed to offer flood protection or drainage may experience conditions beyond those they were designed for and, in some cases, may be ageing and not operating as well as we would want.

People, communities and businesses across Wales need to consider the impacts of climate change and plan ahead. There is still time to do this and we want to avoid alarmist messages which could increase climate anxiety and be counterproductive to encouraging people to take action. We are working to build a fair and resilient Wales in the context of climate change. We are committed to ensuring a just transition to net zero and we intend this strategy to be the start of a much broader conversation about adapting to climate change and what that means for everyone, in every corner of our nation.

## 2.2 Climate-related risks

The Climate Change Committee's (CCC) third climate risk independent assessment (CCRA3-IA) provides the most up to date and comprehensive assessment of the evidence on the risks and opportunities arising from climate change in the UK. CCRA3-IA assesses 61 specific risks and opportunities arising from the changing climate in Wales.

The majority of these have been assessed as having a high level of urgency. The CCC's analysis has highlighted that the levels of risk associated with climate change are increasing and the level of adaptation planning and action across the UK is not yet keeping pace. The analysis also indicates there are huge benefits in taking action for climate resilience, and that acting sooner will be far less expensive than acting later.

### **The risks identified within CCRA3-IA include the following most urgent areas for action:**

- Risks to the viability and diversity of terrestrial and freshwater habitats and species from multiple hazards
- Risks to soil health from increased flooding and drought
- Risks to natural carbon stores and sequestration from multiple hazards, leading to increased emissions
- Risks to crops, livestock and commercial trees from multiple climate hazards
- Risks to supply of food, goods and vital services due to climate-related collapse of supply chains and distribution networks
- Risks to people and the economy from climate-related failure of the power system
- Risks to human health, well-being and productivity from increased exposure to heat in homes and other buildings
- Multiple risks to the UK from climate change impacts overseas

The CCC also published a Wales-specific independent adaptation progress report in September 2023, [Adapting to Climate Change – Progress in Wales](#). This assessment was requested by the Welsh Government to help us to better understand the areas we need to focus on to build resilience to the impacts of climate change. As part of this work the CCC also provided separate briefing papers on the interrelationships between climate change adaptation and [decarbonisation](#), [nature](#) and [social justice](#).

The Welsh Government has welcomed the CCC's advice and recognises the need to do more to tackle the impacts of climate change. We have started to address the CCC's recommendations through the updated approach and specific policy measures set out within this strategy.



### 2.3 Climate parameters for policies and decision-making

This section is based on the CCC’s [Proposed methodology for the Fourth Climate Change Risk Assessment – Independent Assessment \(CCRA4-IA\)](#).

Climate change presents significant risks and challenges (and some opportunities) for delivering national and local policies and our wider societal goals. It is important that we embed climate adaptation into our investments and decision-making if we are to meet our wider policy objectives.

Between now and the middle of the century, continued changes to our climate are largely inevitable, while over longer timescales there are considerable levels of uncertainty over the predicted levels of global greenhouse gas emissions and global warming we can expect. We need to take this into account within our decision-making and policy development.

Central estimates are for global warming averaged across the 2030s of around 1.5°C above preindustrial levels and around 2°C for the 2050s under current policy trajectories. However, uncertainty in the predicted levels of global action to address greenhouse gas emissions means that it remains plausible that global warming might reach around 2°C above preindustrial levels as early as the 2030s and could be 2.5°C above preindustrial levels by the 2050s.

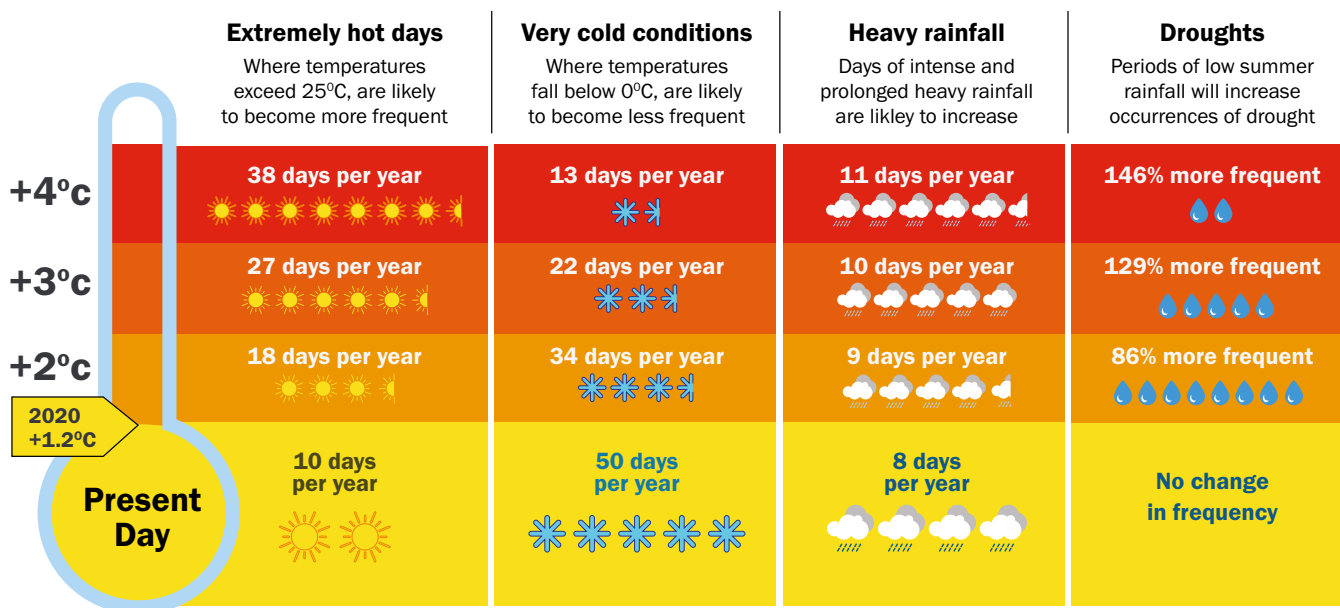
In the second half of the century, a wide range of global warming levels remain possible. Central estimates based on current global climate policy

commitments indicate we can expect around 2.5-3°C of warming above preindustrial levels, but if current international emissions reduction targets are met central estimates of late-century warming would keep to levels of between 1.5–2°C above preindustrial levels – although sea-levels will keep rising for centuries to come. At the high-end of plausible scenarios, global warming of around 3.5°C above preindustrial in the 2080s remains possible with some scenarios reaching and exceeding 4°C above preindustrial levels by 2100.

These changes to average global temperatures translate into significant changes to sea levels, temperature extremes and weather systems.

Figure 1 summarises the changes we can expect to see to our weather patterns and extremes in the UK under different average global warming scenarios. It is important to ensure that we design all our policies, public services and infrastructure to operate effectively under these weather scenarios.

**Figure 1: Global warming and future high-impact weather in the UK**



The CCC's fourth UK Climate Risk Independent Assessment (CCRA4-IA) is due to be published in 2026. The CCRA4-IA will use an updated approach to considering the range of plausible climate futures consistent with the most recent assessments of global and UK climate outcomes published by the United Nations Intergovernmental Panel on Climate Change (IPCC) and other key global evidence providers:

- **Central scenario** – a middle-of-the-road scenario where the UK climate and the associated changes in climate hazards are at the centre of the expected range projected by climate models for that global warming level.
- **High climate hazard sensitivity** – a high global warming scenario where global temperatures increase more rapidly and changes to UK climate and hazards are towards the top of the projected climate model range at that global warming level.

The CCRA4-IA will consider the levels of risks and opportunities over different time periods, ranging from the present day up to the 2080s.

The Welsh Government will seek to apply this overall framing for considering the implications of climate change for all our policy development and decision-making, through our Integrated Impact Assessment process which includes a climate resilience assessment. We ask that all public bodies and wider stakeholders seek to consider the risks arising from climate change over the full lifespan of their plans and projects, and to embed climate adaptation measures into their design as appropriate.

## 2.4 Climate adaptation and social justice

The Welsh Government is committed to tackling all forms of inequality and division within our society. The term social justice refers to a fair distribution of social, political and economic opportunities, benefits and burdens across society. In 2023 we consulted on a [Just Transition to Net Zero Wales](#) as part of our work to ensure we transition to net zero greenhouse gas emissions in a fair way. We also recognise that the adverse effects of climate change could have a disproportionate impact on certain groups or communities and that action will be needed to reduce that risk.

For example, someone who does not have access to digital communication might be less likely to have advance warning about bad weather and be ill-prepared as a result. The Gypsy Roma Traveller community may have particular needs to ensure their homes and culture are resilient to climate change. People on lower incomes might be less likely to have insurance against flood damage, making it harder for them to replace household goods after a flood. There may also be individuals or groups impacted by multiple forms of inequality, for example an individual might be on a low income and have a health condition. This could compound the issues they face and make their needs more complex. There may also be disproportionate impacts on some communities due to their location (coastal areas, flood plains, highly built-up areas lacking cooling tree cover, etc).

All individuals and communities have knowledge and resources they can use to help them adapt to the changing climate and policy makers should work with communities to find what works best for them. This requires regular and meaningful engagement with those communities. We will engage with stakeholders and the public to help build climate resilience in Wales, including through Wales Climate Week and [Climate Action Wales](#) (see section 3.2).

The Well-being of Future Generations (Wales) Act 2015 (the WFG Act) establishes seven interconnected well-being goals for Wales, including *a globally responsible Wales, a prosperous Wales and a resilient Wales*. Climate change adaptation actions can help deliver each of these goals but failure to act on climate change resilience will make those goals more difficult to achieve. We recognise the impacts of climate change will not be felt evenly across the globe, with the worst impacts often falling on those countries, communities and individuals least able to deal with the effects. We will work with the UK Government and international partners, for example through Regions 4 and our Wales and Africa programme, to support equitable treatment for poorer countries impacted by climate change.

The Welsh Government's National Equality Objective 7 states, "*We will create an environmentally sustainable Wales with the capacity to both ensure our journey to net zero is fair and to respond to the inequitable impacts of climate change*".



The Welsh Government is working towards the vision of an anti-racist Wales set out in our Anti-racist Wales Action Plan. The Plan and all our other work aligned to its vision and values aims to collectively make a measurable difference to the lives of Black, Asian and Minority Ethnic people.

As we take forward policies and actions to address the impacts of climate change, we will take appropriate steps to understand whether any groups and communities might be disproportionately affected and will consider the options available for addressing this. We will also seek to ensure fairness in the way people experience any potential opportunities arising from climate change, for example drier summers potentially providing greater opportunities for children to play and people to exercise outdoors.

## 2.5 Climate adaptation and the 'One Health' approach

'One Health' is defined by the World Health Organisation (WHO) as *'An integrated and unifying approach that aims to sustainably balance and optimize the health of people, animals and ecosystems. It recognizes the health of humans, domestic and wild animals, plants and the wider environment (including ecosystems) are closely linked and interdependent.'* One Health is a way of working that is recommended by the WHO to address complex interrelated health issues and to promote sustainable development. The Welsh Government is committed to taking a One Health integrated approach to addressing the health of people, animals and ecosystems.

### Climate change and nature

Climate resilience and nature resilience are intricately linked. Healthy ecosystems provide the 'ecosystems services' that humans rely upon for our own existence, including food, clean water and the air we breathe. Climate change is adding to the wider pressures upon natural ecosystems.

### One Health approach to agriculture

Proposals for the Welsh Government's Sustainable Farming Scheme (SFS) include measures to address animal health and welfare, environmental issues and human health through a One Health approach, within the context of climate change.

This includes consideration of measures to address flood and drought risks, and the management and restoration of peatland and other natural habitats for ecosystem resilience and carbon sequestration.

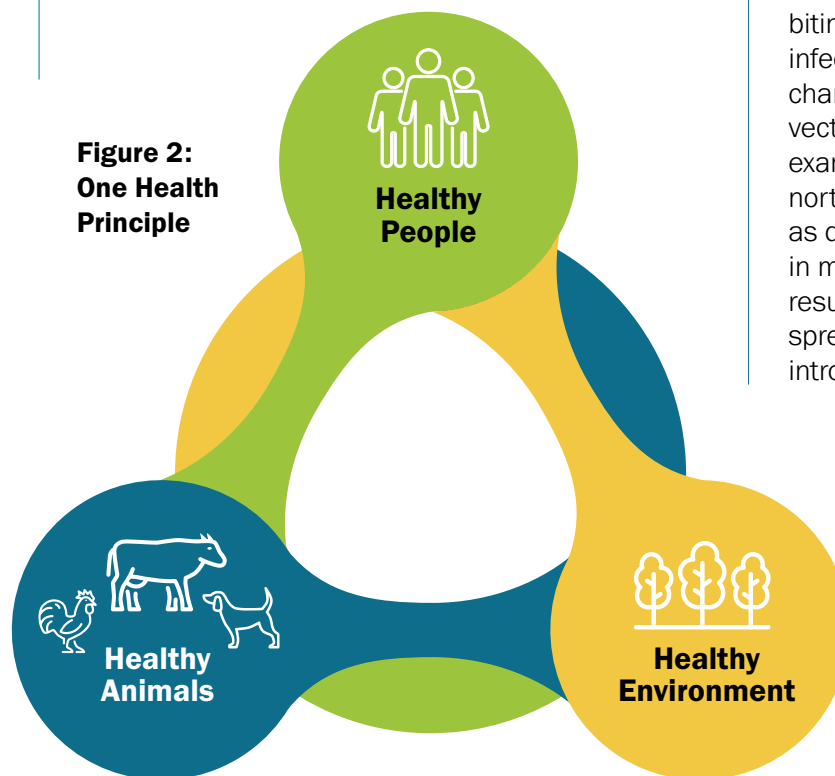
### Climate change and animal health and welfare

Increasing incidence of extreme weather due to climate change can lead to negative impacts for animals and the environments in which they live. There may also be indirect impacts linked to quantity and quality of feedstuffs for animals and drinking water due to drought and flooding.

### Impacts on vector-borne disease

Vectors, such as ticks, mosquitos, midges and biting flies, are living organisms that can transmit infectious pathogens. Climate change is already changing the distribution and ecology of many vectors of disease, and is set to do so further. For example, the Asian Tiger Mosquito is emerging northwards in Europe and can carry diseases such as dengue fever. Ticks are already commonly found in many parts of Wales; there is a risk that, as a result of climate and habitat change, their range will spread further and that exotic tick species could be introduced.

**Figure 2:**  
**One Health Principle**



## Pandemic risk

The emergence of COVID-19 and the loss of millions of lives globally was a stark reminder of the potential impact of emerging diseases of animal origin. Climate change, and its consequent impact on ecosystems and land use, is likely to further increase the number of such diseases spreading from animals to people.

We will ensure there are effective surveillance systems in place, in collaboration with other UK administrations and international bodies, Public Health Wales, the Office of the Chief Veterinary Officer and other key partners, to ensure joined-up monitoring of potential disease threats.

## 2.6 Climate adaptation and decarbonisation

The Welsh Government has set a target to achieve net zero carbon emissions by 2050 with a system of interim emissions targets and carbon budgets. Under the Environment (Wales) Act 2016, Welsh Ministers must prepare and publish a report for each budgetary period setting out their policies and proposals for meeting the carbon budget for that period.

Our [Net Zero Wales](#) plan sets out how the second carbon budget (2021-2025) will be achieved. The plan sets out 123 policies and proposals across all ministerial portfolios. Our focus is now on delivery of Net Zero Wales and action has already been taken on key areas. The next Net Zero Wales will be published in 2026 and will cover Carbon Budget 3 (2026-2030).

It is vital that we track and drive implementation of progress towards Net Zero Wales to ensure we make progress towards our targets and budgets in a fair and just way. We have developed a comprehensive system to monitor delivery including:

- › **Legislation** – requiring us to produce an [assessment against our targets and budgets every 5 years, the latest of which was published in June 2023](#).
- › **Indicators** – tracking general progress towards our targets and budgets on an annual basis. We publish our [Wellbeing of Wales report annually](#).
- › A monitoring and reporting system, which looks more in depth at delivery of the policies within the [Net Zero Wales Plan](#).
- › Independent [progress reports from the CCC](#), the latest of which was published in June 2023.
- › Scrutiny from the Senedd and Senedd committees.

The focus of this Climate Adaptation Strategy is to consider what action is needed to minimise the impacts of climate change, rather than to address greenhouse gas emissions. However, there are important interdependencies, and some trade-offs, between climate change resilience and decarbonisation.

For example, our pathway to achieving net zero is dependent on carbon sequestration by healthy peatland, soils and woodland, which are themselves at risk from climate-related impacts such as drought. We can also expect increasing risks to power supplies due to storms and flooding, while our transport systems are becoming increasingly reliant on electricity as we move away from fossil fuels. It is essential that we consider climate change mitigation and adaptation together as part of a unified approach to tackling the climate and nature emergencies.

The Welsh Government is taking steps to ensure policy co-ordination between climate change mitigation and adaptation through our Climate Change Portfolio Board and through our engagement on the climate emergency with other parts of the public sector and wider society. It is essential that we are tackling both aspects of climate change together so that we can achieve the best possible outcomes.



## 2.7 Supply chains and the circular economy

As our experiences through Covid and the effect of the Ukraine conflict have shown, impacts upon international supply chains can have a direct impact on the availability and cost of goods and materials here in Wales. It is therefore not only the climate change impacts within our borders that we need to adapt to, but also the risks to international supply chains where our dependency for certain products and materials is vulnerable to climate impacts. This includes consideration of the potential collapse of availability, decreases in supply and increased competition for limited resources.

Our commitment to move to a more circular economy, as set out in our [Beyond Recycling](#) strategy, is an important aspect of our climate adaptation action as well as a core part of our action to decarbonise. Moving to a circular economy can shorten and increase the resilience of supply chains and reduce our exposure to supply chain risks. Actions include supporting businesses to adapt their processes to, for example, use recycled materials; mainstreaming and significantly increasing reuse and repair; using public procurement as a lever to support the use of more sustainable and recycled materials; and, taking forward progressive regulatory reforms such as Extended Producer Responsibility. Primary resource exploitation is also a key driver of biodiversity loss globally, so reducing material use and reusing materials will also have benefits for biodiversity globally by reducing these pressures.

## 2.8 Emergency preparedness

The effects of extreme weather and flooding in recent years have demonstrated the need for effective emergency planning, and the value of robust crisis management command and control structures.

Wales must prepare for, and work to mitigate and adapt to, a range of climate change risks, including those arising from floods, landslides, heatwaves and drought, which are expected to become more frequent and severe due to climate change. As a nation, Wales also needs to consider climate-related impacts such as flooding upon our industrial legacy sites.

The Welsh Government, working with partners, is developing a new resilience architecture for national and local preparedness and crisis management response in Wales. This will outline our approach to assessing risk of major incidents and emergencies, delivering measures to prevent them from materialising, and preparedness to help ensure we can respond and recover effectively when emergencies do occur. The Welsh Government is working with partners to clearly define our expectations and how we will support emergency responders and local resilience forums in delivering their statutory responsibilities and functions under Part 1 of the [Civil Contingencies Act 2004](#).

The Welsh Government's approach is built upon a number of core principles, in particular the need for an evidence-driven and shared understanding of the existing and emerging risks Wales faces. Our approach also needs to be systemic, holistic and collaborative, cross-border working with partners at the UK, national and local level. This helps to ensure a joined-up approach to prevent risks materialising and to prepare for emergencies.

Building resilience from the local level up is vitally important and we are working with local authorities, local resilience forums, voluntary and third sector organisations to enhance our approach to community resilience in Wales. This includes empowering our communities to improve their awareness of risks, resilience and self-reliance during emergencies. Working together to build our national resilience will mean we are better equipped to tackle the challenges that come our way.

The five stages of emergency management will underpin our work on emergency resilience to climate change.



**Figure 3: Five Stages of Emergency Management**



## 2.9 Flood and coastal erosion risk management

We have all witnessed the devastation flooding can inflict on homes and businesses, and on the health and well-being of individuals and communities across Wales. There are approximately 273,000 properties across Wales at risk of flooding: 1 in every 7. Climate change is increasing the risks and impacts of flooding, with the number of properties at risk set to increase to approximately 350,000 by 2120, an increase of approximately 77,000 properties (approximately 28%).

[We need to adapt and bring forward innovative solutions to ensure we become more resilient to these risks.](#)

Flooding and coastal erosion are cross-cutting issues relevant to all the 15 adaptation action plans set out in section 5. Here we summarise our overall strategic approach to flood and coastal erosion risk management in Wales.

Our [National Strategy for Flood and Coastal Erosion Risk Management](#) (FCERM) sets out our comprehensive approach and long-term measures for reducing flood risk across Wales. Published in 2020, the strategy draws on learning from the impacts and response to the devastating storms which tragically affect many communities in Wales. We have put emphasis on encouraging improved resilience and collaborative working to reduce risk, by providing strategic direction through clear objectives and measures. We recognise and are focused on delivering more sustainable schemes via Nature-based Solutions, and catchment scale management approaches. FCERM also recognises the importance of clear advice on coastal adaptation for Risk Management Authorities and communities, and the need for Welsh Government to work with Coastal Groups and Natural Resources Wales to develop guidance on coastal adaptation.

Our Flood Investment Programme takes a risk-based approach to the allocation of funding, with a focus on reducing the impacts of flooding and coastal erosion to people, properties, and communities at greatest risk.

Flood risk across Wales is assessed and mapped via a host of modelling, maps and survey data which support our priorities and actions for managing flood risk at a national and local level. Our extensive mapping is also supporting better policy development and direction for considering

how we adapt in the short, medium, and long-term to mitigate against the increasing challenges that climate change will bring.

We recognise it is impossible to stop or prevent all flooding, but we can and are taking steps to reduce the consequences and help to create more resilience across Wales. In 2024-25, despite immense pressure on the public purse, Welsh Government is maintaining record levels of funding for flood risk management, and we have again allocated £75m to our 24-25 Flood and Coastal Erosion Risk Management (FCERM) Programme.

Additionally, our FCERM programme recognises the crucial role that Nature-based Solutions can achieve in alleviating flood. Following a successful pilot scheme, the Natural Flood Management (NFM) Accelerator Programme was launched in October 2023 and is supporting a further £4.6m invested in Nature-based Solutions. This programme demonstrates our commitment to working with Welsh farmers, landowners, and third sector organisations throughout Wales. Our collective partnership collaboration and cross policy approach is bringing wider resilience in the face of the climate emergency and strengthening wider policy development across Welsh Government.

We also continue to invest to support our many at-risk coastal communities across Wales to adapt and become more resilient to the growing challenges associated with rising sea levels and coastal erosion. It is estimated that 102,000 properties across Wales benefit from flood defences and our coastline has in the region of 415km of constructed coastal defence structures that reduce risk from coastal erosion and tidal flooding.

We are nearing the end of our landmark Coastal Risk Management Programme which will invest over £240m, funding 15 schemes across Wales and benefitting almost 14,000 properties.

Coastal communities across Wales will continue to face tough decisions. In response to climate change in some areas it may no longer be sustainable to maintain or build new defences over the long term and we must work with our Risk Management Authorities to plan and support our communities. This may also include managing risks to wider infrastructure such as roads, railways and utilities, all of which are at risk to the threats of coastal change.

Our [Shoreline Management Plans \(SMPs\)](#) set out our policies for managing coastal risk and identify the most sustainable approaches to managing the risks to the coast in the short term (Epoch 1, 2005-2025), medium (Epoch 2, 2025-2055) and long term (Epoch 3, 2055-2105). These plans break the coastline down into smaller sections of coastline which have a particular SMP policy attached.

#### **There are four main SMP policy options:**

- Hold the line by maintaining or changing the existing standard of protection.
- Advance the line by extending new defences into the sea (none applied in Wales)
- Managed realignment which allows the shoreline to move backwards and forwards, with management to control or limit the movement.
- No active intervention where there is no investment in coastal defences and natural processes are allowed.

SMPs have been produced by our Coastal Groups whose membership includes NRW, maritime local authorities, and wider stakeholders with a responsibility for managing the coast and government bodies. SMPs are ‘live’ documents which are maintained by our Coastal Groups. They are underpinned by robust data and evidence and are updated when new information becomes available.

Each SMP has an action plan. This identifies how Coastal Groups will deliver the policy options. Coastal Groups and wider stakeholders may use trigger levels to identify and support transitioning from one policy option to another.

SMPs are soon to enter epoch 2 (2025). Our Coastal Groups together with Wales’ Coastal Monitoring Centre will review the current policies and any changes required to continue to achieve the longer-term sustainability plans outlined within them. In many cases, this will involve some changes in how shoreline management is delivered.

There are nearly 100 locations around Wales which will need detailed adaptation planning, which will require significant sustained investment. Community engagement must be at the heart of any SMP policy change to support adaptive measures.

We also fund our Risk Management Authorities to engage in flood awareness and resilience activities. They offer support on [‘What to do before, during and after a flood’](#). This work also supports community outreach and development of local community plans to enhance resilience and adaptation in areas at high risk of flooding.

#### **2.10 Heat, drought and wildfire**

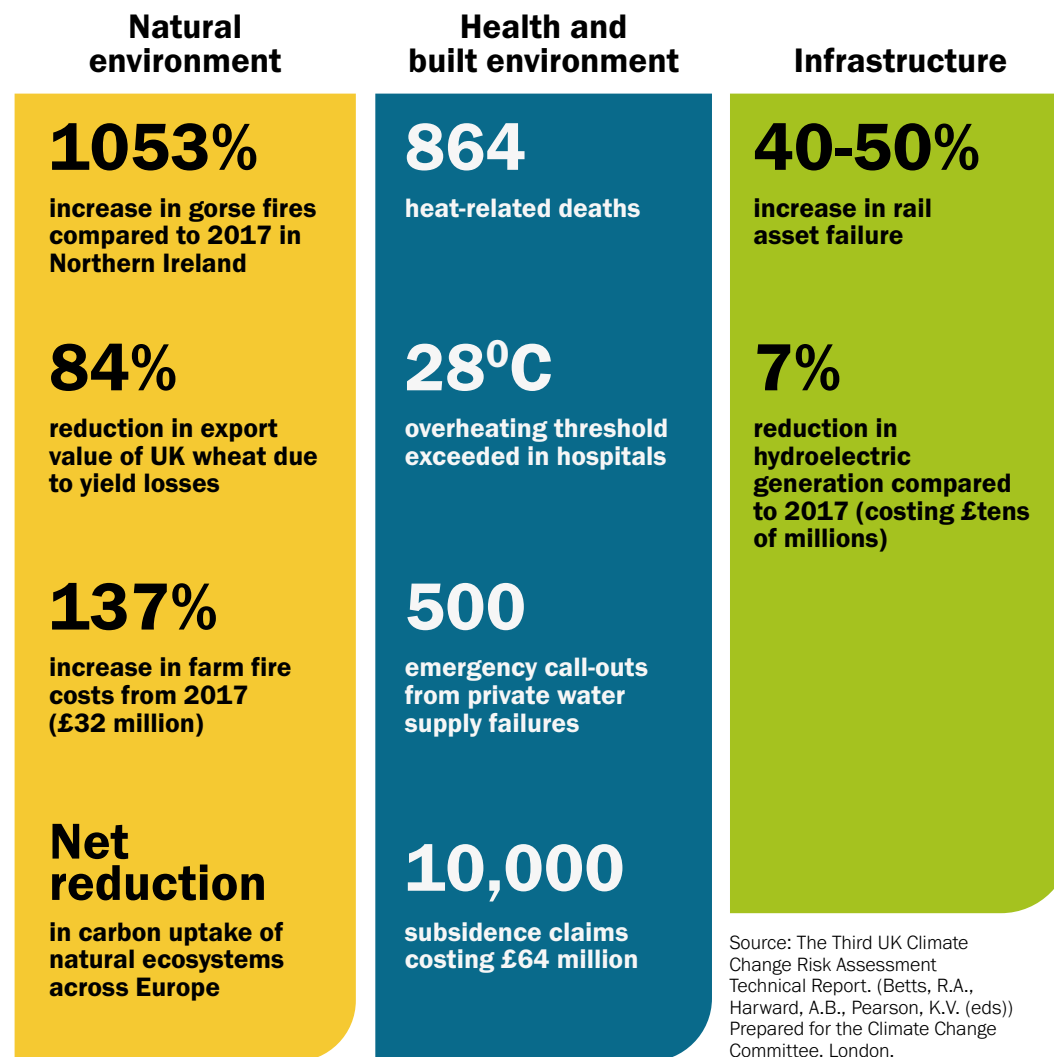
As set out in previous sections, the risk of heatwaves, prolonged periods of drought and wildfires will all increase due to climate change. We have already seen the devastating impacts of extreme heat in other parts of the world. In Wales while we are fortunate to have a relatively temperate climate, even under the lowest emissions scenarios, we can expect to experience extreme heat events one in every two years on average by the year 2050. We have already seen temperatures reach 37 °C in Wales. High temperatures can impact upon infrastructure, power supplies, productivity and health. Some people may be more at risk from heat-related health impacts due to their age, health status and exposure factors such as occupation and socio-economic conditions. We are working with [Public Health Wales to provide guidance and support on how to respond during heatwaves](#).

Prolonged periods of drought may impact on water supplies for households and businesses and affect crop yields, potentially affecting the availability and price of food and making food poverty worse. The failure of a crop in another part of the globe could also have a significant impact on the availability and cost of food in the UK. This also could affect the cost and requirement for livestock feed on Welsh farms. Welsh farmers and rural businesses could be detrimentally impacted by droughts in the future. These conditions will also impact on biodiversity and the functioning of ecosystems in Wales – climate change impacts are a key pressure on biodiversity.

Increasing periods of hot, dry weather are also predicted to increase the risk of wildfires. We will continue to work closely with key stakeholders such as the Fire and Rescue Service, Police, Natural Resources Wales, Public Health Wales, National Park Authorities, Met Office and agriculture industry, to reduce wildfire risk in Wales. This includes consideration of strategic wildfire risks and their mitigation through the Wales Wildfire Board, and sharing of tactical and operational intelligence during the peak wildfire season, via Operation Dawns Glow.

As well as tackling these risks independently, we acknowledge there are interdependencies between them and we are likely to face drought, extreme temperatures and wildfire at the same time, with implications for the NHS and emergency services.

**Figure 4: 2018 Heatwave in Numbers**



Source: The Third UK Climate Change Risk Assessment Technical Report. (Betts, R.A., Harward, A.B., Pearson, K.V. (eds)) Prepared for the Climate Change Committee, London.

# 3. Our strategic approach

## 3.1 Purpose and principles of this strategy

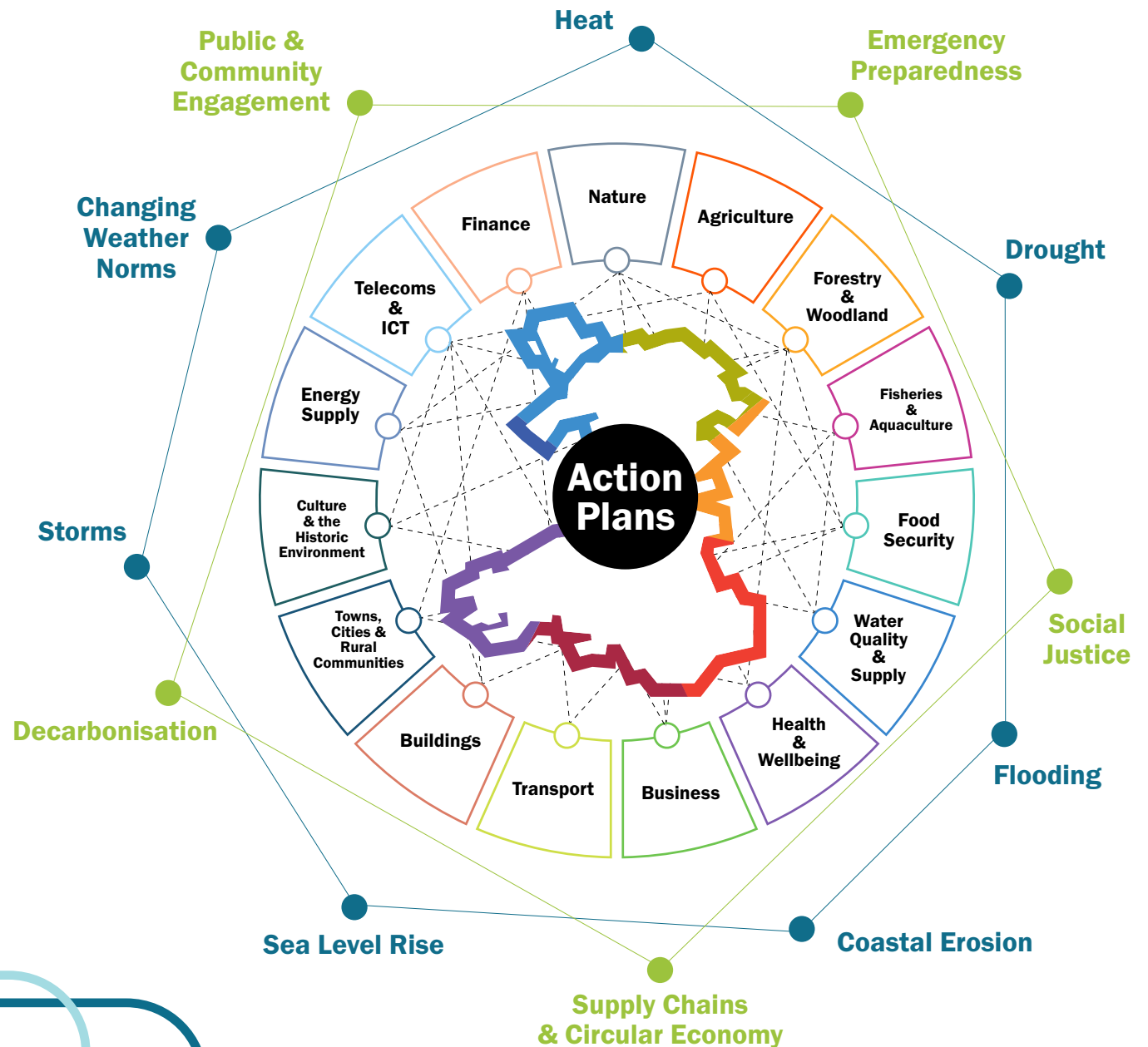
This strategy represents a new approach to considering the interrelated actions needed for addressing climate adaptation and resilience in Wales.

**In developing our approach to this strategy, we have sought to apply the following principles:**

- A focus on delivery of climate adaptation outcomes
- A systems-based approach, addressing interdependencies between different sectors and stakeholders
- A wider perspective of collective action across Wales, recognising the needs and roles of different stakeholders in delivering climate adaptation
- Integration with other societal goals, such as decarbonisation, social justice and nature recovery

Section 5 contains 15 cross-sector adaptation action plans which set out interdependent actions for delivering climate adaptation within each system. Figure 5 illustrates the different elements of the strategy, including the action plans and the cross-cutting issues we are aiming to address.

Figure 5: Climate Adaptation Strategy for Wales



The Welsh Government will continue to work with key stakeholders to develop our policy approach and identify further actions as needed, informed by our monitoring and evaluation framework (see section 3.4).

### 3.2 Public and community involvement

From the richest to poorest countries globally, from urban to rural communities across Wales, no-one will be left untouched by the effects of climate change, but the scale of the impact will vary. Everyone stands to benefit from learning more about how we can adapt and reduce our exposure to climate change and the risks to our health and well-being, homes, communities and environment in which we live. Conveying these risks must be carefully balanced with communications around the opportunities.

The [Climate Action Wales - Public Engagement Strategy \(2023-2026\)](#) sets out how the Welsh Government will work with partners to engage the people of Wales in decision-making on how we tackle and build greater resilience to climate change. The programme initially focussed on climate mitigation and is now seeking to recognise and develop the role of public engagement in advancing action on both mitigation and adaptation, as well as making the links with other important challenges such as tackling the nature emergency. It highlights how public engagement on adaptation can complement and reinforce public engagement on mitigation.

## Our approach to public engagement is set out within our Public Engagement Strategy using the five 'E's framework:

### 1. Exemplify

To inspire action, we will gather and promote case studies on the scale of action already being taken across Wales and the wider world, and within our communities to make our local places more flood resilient and cooler in warmer weather.

### 2. Engage

We will continue a 2-way dialogue on climate change, particularly with marginalised groups and those who are most likely to be affected by future policy decisions. In recognition that the impacts will vary significantly depending on where people live, we will work with our regional partners to deliver an outreach engagement programme to ensure people living across our urban and rural communities are consulted and included in decisions around adaptation interventions. Our Public Engagement Strategy commits to conducting a review to determine the extent to which public engagement is already being undertaken across Wales (and by whom). This review is being completed in 2024 and the findings will be used to consider how to build on methods already being used to encourage community engagement such as the [Climate Conversations Community Engagement Fund](#) centred around Wales Climate Week.

### 3. Enable

We will continue to gather and analyse social research to deepen our knowledge on the levels of public understanding on the impacts of climate change, and the motivations and barriers that exist to building greater climate resilience within our homes and communities.

### 4. Encourage

Communications will be delivered through the [Climate Action Wales campaign and website](#), with a focus on increasing understanding of the need for climate adaptation, demonstrating the practical steps we can take, and providing tools, resources and opportunities to get involved in climate education and policy decision-making.

With levels of concern about climate change already high (e.g. the [National Survey \(2022\)](#) finds that 76% of the population of Wales are 'very' or 'fairly' concerned about climate change), non-threatening approaches will be used, shifting away from fear appeals towards positive and motivational messages.

### 5. Evaluate

Our Public Engagement Strategy commits to on-going evaluation of the overall impact of the public engagement programme. This centres around a 3-year Climate Attitudes Survey as a repeatable method for tracking people's attitudes and behaviours on climate change, supported by the Welsh Government's National Survey for Wales which also asks people a range of different questions about their views on climate change. In winter 2024, a Theory of Change evaluation methodology will be published as a solid base for monitoring public engagement, including a set of indicators against which progress will be measured.



The Curriculum for Wales also recognises the importance of educating our children and young people about the climate crisis and environmental sustainability.

Learning about the environment and climate change is mandatory within the Curriculum for Wales, through both Humanities and Science and Technology. This ensures learners engage with the challenges posed by the climate and nature emergency and provides opportunities for schools to select a range of topics and learning contexts related to climate change, sustainability and biodiversity.

Through the curriculum, learners will develop an understanding of how human actions in the past, present and future can affect interrelationships between the natural world and people. It is through this learning that our children and young people will gain an awareness of how the future sustainability of our world is influenced by the impact of those actions. Learners are also encouraged to evaluate scientific claims to help them make informed decisions that affect our environment and well-being, including the climate and nature emergency.

We recognise that children and young people are concerned with the impact of climate change, and, for some, this will bring with it feelings of anxiety. That is why, through the Health and Well-being area of learning and experience, learners will be encouraged to make sense of their emotions and learn how to respond to them. Schools will be expected to support learners to develop strategies which help them to regulate their emotions and help them to seek appropriate sources of support when faced with sources of anxiety, such as climate change.

### 3.3 Governance

Our Programme for Government has clearly set out the need to respond urgently to the climate and nature emergencies. Climate change adaptation and mitigation are both cross-cutting priorities for the Welsh Government.

As set out in previous sections, climate change adaptation is a complex and challenging policy issue. It is important that governance arrangements are in place to oversee our work on climate change adaptation. The following table sets out how we will provide governance on this agenda going forward.

To support this, we will establish a new policy futures forum which will bring together external experts and policy leads within Welsh Government.

The following governance table sets out how the Welsh Government will oversee adaptation over the coming years.

What	Owner	How	Purpose/function
Delivery of adaptation action plans	Individual Welsh Government policy teams	Internal working group, annual monitoring process	Delivery assurance
Driving up ambition and sharing best practice	Welsh Government Climate Change team	Policy Futures Forum	Creating space for policymakers to learn from forward thinkers on climate adaptation
Overall delivery of adaptation strategy	Climate Change Senior Responsible Owner	Climate Change Portfolio Board	Assurance; risk management; escalation;
Independent challenge/scrutiny of strategy	Climate Change Committee	Progress reporting, we will commission future progress reports from the CCC on adaptation	Scrutiny, accountability

### 3.4 Monitoring progress

As set out in section 1, we published a progress report on climate adaptation in December 2022 and also commissioned an independent adaptation progress report from the CCC which was published in September 2023. These have helped to inform the policy measures set out in this strategy and the associated adaptation action plans set out in the section 5 annex. We will undertake further reviews and report on progress within the next 5 years.

We are developing a new monitoring framework to support the delivery of this strategy. This will provide the ongoing information we need to assess progress in addressing climate risks in Wales and to identify where further action may be needed. The details of the new monitoring framework will be published separately.

It is our intention to align our new monitoring approach with the [CCC's adaptation monitoring framework](#) and with our other strategic monitoring frameworks across policy areas. We will seek periodic independent progress assessments from the CCC as part of our future strategic policy approach. We will also undertake our own tracking of progress against the climate adaptation outcomes and actions set out in this strategy. We will seek to make best use of existing evidence sources and will also work to address any evidence gaps highlighted by the CCC in its [2023 Wales adaptation progress report](#).

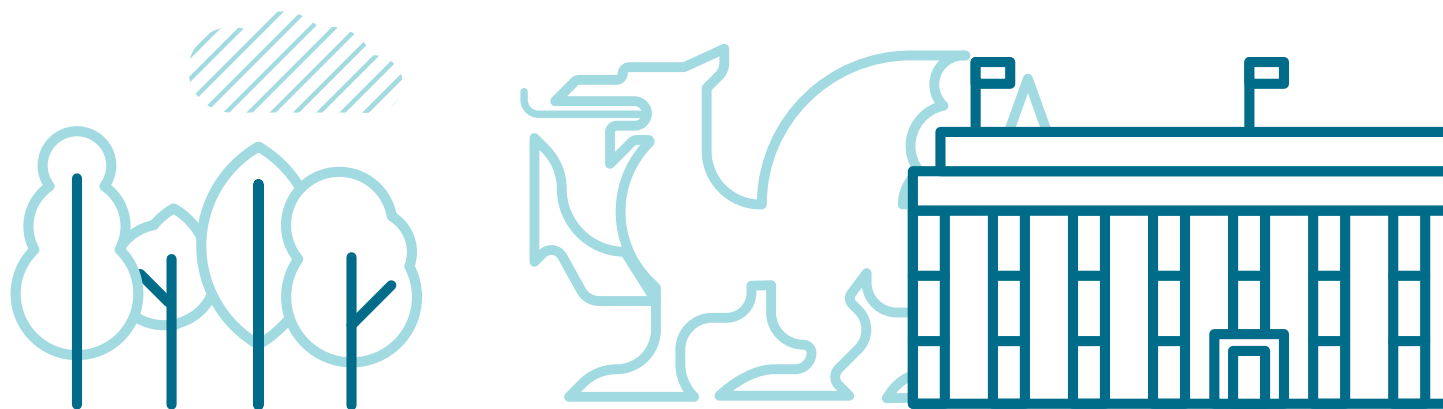
### 3.5 Public sector reporting and guidance

Section 67 of the Climate Change Act 2008 gives powers to the Welsh Ministers to direct Welsh reporting authorities to prepare reports on the assessment of current and predicted climate change impacts and their proposals and policies for climate adaptation, and to provide an assessment of their progress towards implementing proposals and policies set out in any previous reports. This 'Adaptation Reporting Power' (ARP) has not been applied by the Welsh Ministers to date.

Following publication of this strategy and the associated monitoring framework, it is the Welsh Government's intention to consider the potential role of public sector reporting as part of our wider climate adaptation monitoring and evaluation programme in Wales.

#### In doing this we will seek to:

- Work closely with public sector stakeholders to develop the proposed approach.
- Utilise existing governance arrangements, evidence and data sources wherever possible.
- Avoid undue duplication and additional burden on Welsh public bodies.
- Focus on the evidence and data needed to track adaptation progress in line with our monitoring framework, and on addressing the evidence gaps identified by the CCC in their 2023 Wales adaptation progress report.
- Enable sharing of monitoring information and analysis across the public sector to help inform climate adaptation planning.



# Annex I

## 4. Working together

The Welsh Government has an important role in adapting to climate change, but we cannot do this alone. We recognise the important roles played by strategic partner bodies, Local Government, third sector organisations, businesses, communities, and the UK Government. These roles are recognised in the 15 Adaptation Action Plans set out in section 5 of this strategy.

There is a legal duty upon public bodies in Wales to carry out sustainable development, as defined within the WFG Act. Adapting to a changing climate is a necessary part of working in accordance with the sustainable development principle and the five ways of working associated with it (including taking a long-term view and preventing problems from arising or getting worse).

There are several key areas for climate change adaptation that are reserved to the UK Government or which have reserved elements and devolved elements. These include economic policy, financial services regulation, and aspects of energy and telecommunications. For these areas, where appropriate, we have included key asks of the UK Government within the Adaptation Action Plans in section 5. We will continue to work with the UK Government and other devolved governments to make progress on areas which are beyond our direct control.

We intend this strategy to be an initial starting point for further engagement and involvement with wider stakeholders and the public in Wales, to develop ideas and facilitate further action. This will help to inform continuous improvement in our national approach towards achieving positive and fair outcomes for all, as we respond together to the challenges arising from climate change.

The content within the following sub-sections has been provided by strategic partner bodies in Wales, aiming to provide a short, high-level summary of their role and main areas of work in relation to climate adaptation.

### 4.1 Key actions being taken by Natural Resources Wales

As the government environmental agency for Wales, it has long been accepted that climate change will increasingly impinge upon the delivery of most of NRW's remit. Over the last two decades there has been much focus on understanding the risks, impacts and vulnerabilities of the natural environment to climate change, along with other aspects such as flood assets, timber production and local communities. NRW has informed development of the UK Climate Projections and the Climate Change Risk Assessment from both a user and provider perspective. It has also sought to demonstrate action on the ground, for example, through projects such as managed retreat at Cwm lvy Marsh following a breach in the sea wall in 2014, and integrating consideration of sea-level rise impacts into its management planning for protected sites such as Bosherton Lakes and Cors Fochno.

Based upon this past work, NRW has recognised that climate change and its impacts are affecting its work today, with a strong likelihood that they will become much more severe in future. Consequently, NRW has recently undertaken a systematic baseline risk assessment of how climate risks, impacts and opportunities will affect the breadth of its activity to understand the climate risks identified in the UK Climate Change Risk Assessment that will require high urgency adaptation action. Using this risk-based scoring approach, NRW has then consulted across the organisation to identify relevant current, planned or future activity that will address adaptation need in each of its business areas to form its first organisation-wide Adaptation Plan. Over 50 actions were compiled and prioritised according to a set of criteria and classified under 32 organisational adaptation priority themes that are linked to its Corporate Plan's Well-being Objectives. Among the key conclusions of this work was that no part of the organisation will be unaffected by climate change and that alongside taking early action, building NRW's adaptive capacity and evidence base is imperative.

**NRW has identified within each of its business areas across the organisation up to five adaptation priority actions that need to be prioritised over the next few years. The following actions give a flavour of NRW's current and planned activity:**

- Develop and deliver catchment approaches, including Nature-based Solutions to reduce flooding and contribute to ecosystem resilience, working with partners and stakeholders where possible and appropriate.
  - Develop and deliver Coastal Adaptation Programme pilot sites in the most vulnerable locations to build an evidence base for longer-term adaptation strategies.
  - Updating NRW's Incident Management plans to better include incidents and disruptions that are increasingly likely due to climate change.
  - Adapting current and future forests to cope with wildfires by utilising open spaces, selecting suitable species for fire breaks, and working closer together with fire and rescue services.
  - Creating corridors of good quality habitat linking the National Nature Reserves in the care of NRW and the wider landscape to reduce the impacts of habitat fragmentation and increase dispersal and diversity through the development of Nature Recovery Networks.
- Deliver NRW's Integrated Coastal Management Programme to join up delivery of coastal projects through for example, implementing Shoreline Management Plans, developing Nature-based Solutions and engaging with communities around coastal change.
  - Influencing, permitting and regulating those NRW works with to deliver adaptation through existing permitting and Environmental Management Systems.
  - Ensure all NRW ICT infrastructure systems, including flood warning, are 100% cloud-based, reducing climate-related risks posed by physical data centres.

Alongside considering adaptation within its own organisation, NRW is working collaboratively and seeking to facilitate wider adaptation to climate risk working with partners across Wales. Recently, NRW published guidance to help Public Services Boards (PSBs) to develop a Local Climate Risk Assessment that when complete will enable evaluation of climate risk and adaptation need in a local context. Achieving an integrated approach to adaptation delivery is also supported by collaborative work arising from NRW's six terrestrial and one marine Area Statements – within each of them climate change features as a priority. NRW's Marine Area Statement has three themes: building resilience of marine ecosystems; making the most of marine planning; and Nature-based Solutions and adaptation at the coast – these underpin its marine work and are also reflected in the marine priorities in the Adaptation Plan. NRW is also supporting the work of the Local Government Climate Strategy Panel, including consideration of how climate risk and adaptation can be better considered in local authorities. NRW will also be advising in a Welsh context on the development of the next version of the CCC's Climate Risk Independent Assessment (CCRA4-IA) as well as producing an updated synthesis of climate related evidence and trends as part of the State of Natural Resources Report SoNaRR 2025.



## 4.2 Key actions being taken by Public Health Wales

Tackling the public health effects of climate change is a long-term strategic priority for Public Health Wales (PHW), as set out in its updated long-term strategy (2023-2035). Climate change is recognised as the most significant public health threat of the century, endangering physical health, mental health and well-being. It threatens all areas of life that impact our ability to achieve and maintain good health. In October 2021, the World Health Organization declared climate change to be the single biggest health threat facing humanity due to rising global temperatures.

The impacts of climate change are multifaceted and already being felt within Wales, both in terms of physical threats to life through extreme weather events, as well as climate related anxiety. We know that some communities in Wales are likely to be more severely impacted by the effects of climate change than others, and some less likely to be able to take action to respond to these effects. PHW's role is to monitor the health impacts of climate change and ensure measures are in place to adapt to, and mitigate against, those impacts.

**PHW has adopted the International Association of National Public Health Institutes (IANPHI) framework for action on health and climate change, which highlights how national public health agencies have a critical role in dealing with climate change across 3 areas:**

### 1. Protect, promote and educate

- › Protecting people and communities from the health effects of climate change, with a particular focus on equity and reducing health inequalities.
- › Educating colleagues across the health and care system about climate and health risks, making sure they feel able to act and respond to changing demand.
- › Promoting healthy environments and lifestyles, using changes in health behaviours and health impact assessments to influence policy and decision-making.
- › Helping people and communities adapt to and reduce the health effects of climate change.

### 2. Response and action

- › Making sure policy advice and guidance, based on evidence, is given across the public health system in Wales.
- › Co-ordinating action and contact with other UK nations and agencies and across the public health system in Wales.
- › Making sure we are prepared for and respond to extreme weather, together with other partners, in a way that recognises where communities may be more exposed to climate risks or may have less means available to manage the impacts.

### 3. Monitor and evaluate

- › Developing climate monitoring so that we can check the effects of climate change on health and well-being and guide further action from agencies, including incorporating early-warning systems.
- › Carrying out research into the public health effects of climate change, and the effectiveness of interventions aimed at reducing them.
- › Evaluating the health effects of climate policies in Wales and the effect of our own ways of working.

### 4.3 Key actions being taken by Local Government

As leaders in communities, councils are at the forefront in tackling global warming and mitigating against climate risks. Councils are also committed to addressing climate impacts, recognising the urgency of taking comprehensive action to safeguard the environment and community well-being, as well as preparing people and places for the impacts of climate change.

Councils deliver a range of essential services and manage key infrastructure, many of which are already impacted by flooding, increased storminess or heatwaves for example. They face daily challenges trying to adapt to current impacts whilst also being acutely aware of increased pressures linked to future risks. The recent [WLGA Review of Local Authorities' Climate Change Response](#) highlighted numerous effective examples of adaptation, a step in the right direction, but also identified that more momentum and prioritisation of adaptation was needed, and the future expenditure of managing climate impacts will outweigh initial and incremental investment aimed at building resilience. Doing nothing now is not an option.

Responding to this urgency, the Local Government Climate Strategy Panel, set up in 2020 to help lead, support and give strategic overview to decarbonisation work in local government, decided to set-up an Adaptation Task and Finish Group to take forward the adaptation and resilience agenda.

## The group is now working on identifying how adaptation can be embedded in local government workings through 4 areas of focus:

### 1. Partnership and Collaboration

Councils work closely with a range of partners and stakeholders to improve delivery of services and adapt to climate change, thus recognising the importance of cross-sector working and close collaboration to further increase resilience. Some positive work on adaptation is done through Public Services Boards where many of them are developing climate impact assessments or adaptation plans. There are also a range of opportunities to adapt and increase resilience on a regional scale via the work of Corporate Joint Committees on Regional Transport Plans and Strategic Development Plans.

### 2. Service Resilience

Councils also acknowledge that whilst adaptation may yield better results delivered collaboratively, they need to increase the resilience of their own services through better understanding of climate risks and changing the way they deliver services and manage assets and infrastructure. Developing approaches to organisational risk management, that incorporate climate impacts and regularly evaluate potential risks and vulnerabilities in local services and infrastructure, will be key components to increased service resilience.

### 3. Community resilience

Through the Well-Being of Future Generations Act, councils have a duty in ensuring community well-being. The decisions councils make, for example planning decisions, support to local businesses, or community education on climate risks and impacts, can have major implications on community sustainability and resilience. While we are seeing some of this work taking place around flood and coastal risks, this needs to be more widespread to include climate risks. Local communities themselves should also be involved in this work to enhance community acceptance of the need to adapt.

### 4. Leadership

Local leaders are instrumental in driving service change and seeking community buy-in. Leaders and Cabinet Members have been engaging in the WLGA's Climate Change Support Programme to share intelligence and learning on the best ways to incorporate climate change considerations into their decision making. The Adaptation Task and Finish Group will work closely with leaders and members in ensuring that adaptation is at the heart of decision making through a series of commitments.

#### 4.4 Key actions being taken by Public Services Boards

Public Services Boards (PSBs) are statutory partnerships, locally led, which determine well-being plans based on evidence from their local well-being assessments. PSBs were established under the WFG Act and came into effect from 2016. Their purpose is to improve collaborative working across public services on local footprints through assessing and address the long-term well-being needs of their areas.

There are 13 PSBs across Wales. Board members include leaders from the relevant local authorities, local health board, the fire and rescue authority, and Natural Resources Wales. They must invite representatives of Welsh Ministers, the police, the police and crime commissioner, probation services, and at least one representative from the voluntary sector. They may also invite other organisations who fulfil public services in their area.

PSBs are required to carry out a well-being assessment of their local area to determine well-being needs. These are aligned with the ordinary local government election cycle and the last round were published in May 2022. The findings from the wellbeing assessment inform the development of a well-being plan, which presents the PSB's objectives and actions, and must be published within 12 months of the assessment. The last round of local well-being assessments all identified climate change and nature as priorities for action.

Nearly all current local well-being plans include actions focused on mitigating climate change and some also include actions in respect of adaptation.

All PSBs have confirmed their intention to carry out formal climate change risk assessments before developing more specific action plans to improve the resilience of nature and people to the impacts of climate change.

PSBs are required to publish annual reports to show progress against their local well-being plans.

## Annex II

### 5. Cross-sector adaptation action plans

This section sets out a series of 15 strategic cross-sector adaptation action plans.

These action plans are broadly aligned with the 12 systems set out within [CCC's climate adaptation monitoring framework](#).

#### Each action plan sets out:

- > **Climate Adaptation Outcomes – What does good look like?** What a climate-resilient future would look like and the outcomes we want to see. These outcomes are based on the CCC's climate adaptation monitoring framework.
- > **Welsh Government Actions** – The actions we are taking, and will take, across different policy areas to help deliver these outcomes.
- > **Working Together – The ask of others** The roles and actions needed from wider stakeholders in delivering climate adaptation.



## 5.1 Our Adaptation Action Plan for Nature

### Climate-related risks to nature

Nature is essential for human existence, health and well-being. Most of nature's contributions to people's well-being are not fully replaceable, and some are irreplaceable. These 'ecosystem services' provide improved climate resilience for other systems, for example through regulating water filtration and flow to protect towns and cities; and cycling nutrients and forming soils to support agricultural systems and food security. It is essential to ensure nature itself is climate resilient if we hope to achieve climate resilience overall.

CCRA3-IA describes the risks to terrestrial, freshwater, marine and coastal habitats resulting from changing climatic conditions and extreme weather events, including temperature change, wildfire, wind, and altered hydrology (including water scarcity, flooding and saltwater intrusion). Marine risks also include acidification and changes in storminess. Coastal habitats are also vulnerable to sea level rise and sea warming. Risks from climate change may lead to changes in species population numbers, timing of life cycle events, species movement and distribution. These are affected by habitat availability, wildfires, other climate drivers and interdependencies between species, habitats and ecosystems, and we are already seeing many of these changes.

Climate change is exacerbating the wider existing pressures upon species and ecosystems such as pollution and unsustainable development, so it is important to address these areas too.

In particular, climate driven increases in pests, pathogens and invasive non-native species (INNS) are likely to disrupt key ecosystem functions, threaten individual species or whole habitats and can severely impact a range of ecosystem services.

Our approach to delivering climate resilience for nature has been set in legislation through the Environment (Wales) Act 2016, the objective being for public authorities to seek to maintain and enhance biodiversity, and in doing so promote the resilience of ecosystems and the benefits they provide. Resilient ecosystems may be defined as diverse, connected, of sufficient extent and in good ecological condition so that they can adapt to change and continue to provide benefits for future generations. Many of our climate adaptation actions are therefore the same as our actions to maintain and enhance biodiversity and promote ecosystem resilience, while others address specific policies to help habitats and species adapt to climate change impacts and risks.

### Climate Adaptation Outcomes

#### What does good look like?

#### **Terrestrial, freshwater, marine and coastal species and habitats are in good ecological health and resilient to the impacts of climate change:**

Protected areas in favourable condition

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Across all areas, increased habitat diversity, extent, connectivity and species-richness, resulting in greater ecosystem resilience and reducing greenhouse gas emissions from natural carbon stores

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Restored peatland hydrology, to increase ecosystem resilience, reduce wildfire risk, regulate water flow, and safeguard peat resource and stored carbon.

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Reduced variance in average freshwater temperatures and river flows

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Increased use of 'Nature-based Solutions'

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'One Health' approach to minimise the threat of transmission of domestic animal diseases to wildlife and vice versa

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## Welsh Government actions

No.	We will:	Timescale for delivery
<b>In our nature policy area:</b>		
	Respond to target 3 of the <a href="#">Kunming-Montreal Global Biodiversity Framework</a> , building on the <a href="#">Ministerial Deep Dive</a> and our commitment to protect and effectively manage 30% of our land, freshwater and marine areas by 2030 (the so-called '30 by 30' target):	2030
1	Expand and accelerate our Nature Networks Programme to help improve the condition and connectivity of our protected sites and make them more resilient to climate change.	2045
2	Invest in our Local Nature Partnerships (LNPs) to bring together organisations, businesses and communities to take collective action to address local priorities.	2024-26
3	Take forward the advice of our three Deep Dive expert groups to identify potential Other Effective Area-based Conservation Measures (OECMs), the contribution that our National Landscapes can make to '30 by 30' and our approach to monitoring and reporting.	2024 – ongoing
4	Create a network of Nature Recovery Exemplar Areas across a range of different semi-natural habitats to help demonstrate how effective action can be taken to halt biodiversity loss and aid nature recovery.	2025 -30
5	Review the Sites of Special Scientific Interest (SSSI) series to inform an accelerated notification programme, aligning it with the Nature Network Programme.	2024 -30
6	Further develop and publish our Nature Networks maps which provide spatial guidance for the delivery of Global Biodiversity Framework (GBF) target 2 (restoring 30% of degraded ecosystems) and target 3 (30% of land, water and seas).	2024
7	Continue to report against <a href="#">National Milestones</a> for biodiversity.	Annually
8	Develop statutory biodiversity targets and put in place mechanisms for their delivery.	2024–26
9	Update our statutory Natural Resources Policy (which it is planned will also contain our biodiversity strategy) and continue to embed the priorities identified in it across Welsh Government and the wider public sector.	2024–25
10	Work with NRW to update and use their statutory Area Statements to guide place-based actions to deliver the priorities identified in our Natural Resources Policy.	Ongoing
11	Continue the Marine Protected Area (MPA) network completion programme, to ensure all habitats and features are afforded protection within the MPA network.	Ongoing

No.	We will:	Timescale for delivery
12	Deliver the MPA management framework, setting out management principles for a coherent and well-managed network.	Ongoing
13	Continue to fund interventions to improve the condition of our network along with projects focused on developing our understanding of the risks to our network from climate change.	2024
14	Deliver a range of management actions through the MPA Management Grant Scheme, providing ongoing support to deliver an annual MPA Action Plan, led by competent authorities and other key organisations.	Ongoing
15	Publish a new Welsh Seabird Conservation Strategy which will set objectives to improve seabird populations in Wales based on vulnerability to pressures, which will be supported by key funded actions.	2025
16	Fund restoration of key coastal habitats such as saltmarsh and seagrass, to improve climate adaptation for marine species, as well as benefits for coastal processes, such as wave dampening and erosion control	2026
17	Deliver evidence and monitoring programmes, which support our future policy making and inform delivery especially in relation to climate impacts.	Ongoing
<b>In our marine planning and marine resilience policy areas:</b>		
18	Use the Welsh National Marine Plan policies to maintain and enhance the resilience of marine ecosystems and the benefits they provide, including SOC_11: Resilience to climate change – whereby development proposals should demonstrate that they have considered the impacts of climate change and have incorporated appropriate adaptation measures.	Ongoing
19	Review approaches and methodologies to consider climate change pressures during the next marine planning period.	2026
20	Support the Wales Coasts and Seas Partnership to deliver enabling actions to improve the resilience of the marine environment: <ul style="list-style-type: none"> <li>– An Ocean Literacy Strategy to develop understanding of our impacts on the marine environment and how everyone can contribute to its resilience</li> <li>– A long-term blue investment fund to support marine resilience actions</li> <li>– Building capacity nationally and in local communities to engage on and implement marine resilience actions</li> </ul>	2024-2026
21	Continue to support the Marine Climate Change Impacts Partnership to understand the major climate impacts and review and prioritise actions to address them.	Ongoing

No.	We will:	Timescale for delivery
22	Continue to develop our understanding of blue carbon and the role it can play in adapting to future climate change, both through the UK Blue Carbon Evidence Partnership and through convening a blue carbon forum for Wales to share information and knowledge and accelerate the already growing body of expertise and experience we have in Wales.	2024
<b>In our fisheries and aquaculture policy area:</b>		
23	Address potential links with wild caught marine species and aquaculture and the effects of overexploitation on ecosystem resilience.	Ongoing
24	Ensure that fisheries and aquaculture activities are managed using an ecosystem-based approach as to ensure that any negative impacts on marine ecosystems are minimised and where possible reversed, and that catches of sensitive species are minimised.	Ongoing
25	Consider the advice arising from the <a href="#">Assessing Welsh Fisheries Activities</a> project in drafting Fisheries Management Plans.	Ongoing
<b>In our water resources policy area:</b>		
	Work with water companies to:	
26	Provide robust guidance, along with NRW, to the companies as they develop their Water Resource Management Plans to ensure that they consider the risks, opportunities and scenarios arising from climate change and how they will ensure a resilient supply of water.	Ongoing
27	Continue to encourage catchment-based approaches and Nature-based Solutions for the management of water bodies through guidance for water companies.	Ongoing
28	Reduce sewer discharges that impact on the environment and aquatic life in fresh and marine water.	Ongoing
29	Work with members of the Wales Drought Liaison Group (WDLG) to plan the strategic direction for water resources management in Wales. The WDLG is chaired by the Welsh Government with membership comprising national organisations involved in water resources management and communications.	Ongoing

No.	We will:	Timescale for delivery
30	Respond effectively to incidents, such as extreme weather events See also section 5.6 Our plan for climate resilient water quality and supply	Ongoing
<b>In our Invasive Non-Native species (INNS) policy area:</b>		
Adhere to the actions and tasks set out in the <a href="#">GB Invasive Non-Native Species Strategy 2023-30</a> :		
31	Develop and implement Pathway Action Plans (PAPs) and contingency response plans	2023-30
32	Engage in and promote relevant communications campaigns and provide funding and support for projects which seek to reduce the effects of invasive non-native species in Wales.	
33	Enforce and support legislation through cooperation with the police, Natural Resources Wales and the GB Invasive Non-Native Species Inspectorate.	
<b>In our plant health policy area:</b>		
34	Adhere to the actions and tasks set out in the <a href="#">GB Plant Biosecurity Strategy 2023-28</a> . This includes the delivery of our vision and 4 key outcomes, including the delivery of the Action Plan. Through this the Welsh Government will protect our plants through a strong partnership of government, industry, and the public, working together to reduce and manage risks posed by plant pests and pathogens, and facilitate safe trade.	2023-28
<b>In our agriculture policy area:</b>		
35	Include measures within the SFS to promote the management of SSSIs and collaborative landscape-scale action. Also to promote the sustainable management of peatlands and avoid tree planting on deep peat. The activities of the Sustainable Farming Scheme are vital to the achievement of our nature policy objectives because 80% of the land area in Wales is under agricultural management.	Ongoing
36	Reduce agricultural pollution, to improve the resilience of our terrestrial and aquatic habitats and species. We aim to achieve this through a range of interventions aligned to the SFS, including regulations, advice and guidance and working with the Wales Land Management Forum sub-group on agricultural pollution and other key stakeholders. See further information in section 5.2 <i>Our Adaptation Action Plan for Agriculture</i> .	
<b>In our peatland policy area:</b>		
37	Restore 600ha of peatland p.a. 2020-2025 (Current)	2020-25

No.	We will:	Timescale for delivery
38	Increase the annual rate of restoration to deliver 1,800ha of peatland restoration p.a. by 2030.	2020-30
39	Restore c.45,000ha of peatland by 2050.	2050
40	Update the Peatlands of Wales Map to further improve our understanding of the peat resource in Wales and identify opportunities to restore.	2025
41	Publish all peatland restoration data	2020-45
<b>In our forestry policy area:</b>		
42	Ensure tree planting funded by Welsh Government is delivered in line with the <a href="#">UK Forestry Standard</a> and that sensitivities to woodland creation, including deep peat and priority habitats, are fully considered in the design and location of new woodland.	Ongoing
43	Encourage new planting in places where ecosystem benefits are maximised, such as buffering ancient woodlands, expanding the woodland habitat network and intercepting run-off to improve water quality.	Ongoing
44	Consider the development of a woodland management scheme to improve the condition of woodland habitat.	Ongoing
<b>In our buildings policy area:</b>		
45	Implement the <a href="#">Welsh Housing Quality Standard (WHQS 2023)</a> which encourages landlords to consider biodiversity opportunities across the land that they own and manage.	Ongoing
<b>In our development planning policy area:</b>		
	In line with <a href="#">Planning Policy Wales (PPW)</a> , we will:	
46	Deliver our ambition for achieving a <a href="#">net benefit for biodiversity</a> (NBB) in our planning system, through the implementation of Chapter 6 of Planning Policy Wales (PPW), requiring biodiversity net benefit to be embedded into relevant planning applications	Ongoing
47	Ensure that planning policy and renewable energy development safeguards peat and other habitats, in line with PPW Chapter 6.	Ongoing
48	Work with local planning authorities and key stakeholders to develop and pilot strategic planning guidance for Policy 9 of <a href="#">Future Wales: The National Plan 2040</a> , in relation to green infrastructure and resilient ecological networks for nature recovery and climate change adaptation.	Ongoing
49	Work with water companies to improve outdated drainage systems across Wales, with an emphasis on sustainable, nature-based drainage in our urban areas.	Ongoing

No.	We will:	Timescale for delivery
<b>In our transport policy area:</b>		
50	Integrate Nature-based Solutions into the planning and development of new transport-related infrastructure.	Ongoing
<b>In our animal health policy area:</b>		
	Take a 'One Health' approach to minimise threats from transmission of domestic animal diseases to wildlife and vice versa:	
51	Jointly sponsor the surveillance of arthropod vectors of diseases of animals and people in Wales (e.g. ticks, midges, mosquitos).	Ongoing
52	Collaborate with key sector stakeholders on the surveillance and control of diseases of wildlife, including diseases that also threaten people and kept animals.	Ongoing
53	Promote high standards of biosecurity on farms to reduce of diseases spreading between wild and kept animals.	Ongoing
54	Horizon-scan for emerging threats overseas, such as spread of African Swine Fever in wild boar in Europe. And appropriately risk-manage identified hazards.	Ongoing
55	Improve our understanding of the implications of changing climate, ecosystems and land use patterns on risks to wildlife health. And consequently on biodiversity and the health of people and kept animals, taking a One Health approach.	Ongoing
<b>In our flood and coastal erosion policy area:</b>		
	Section 2.9 summarises our national policy approach to flood and coastal erosion risk management, through which we will:	
56	Deliver and encourage Nature-based Solutions for providing cost effective and efficient interventions to address climate challenges such as coastal erosion and flooding, in line with the policies set out in SMPs.	Ongoing
57	Deliver our <a href="#">Programme for Government</a> commitment to 'Deliver nature-based flood management in all major river catchments to expand wetland and woodland habitats.	Ongoing
58	Continue to deliver our <a href="#">Natural Flood Management (NFM) Accelerator Programme</a> to reduce flood risk management using Nature-based Solutions.	Ongoing
59	Undertake a Review of NFM and Catchment mapping to support more innovative solutions and collaborative policy integration with the Sustainable Farming Scheme (SFS) via the scheme's Optional Actions.	Ongoing

### Our ask of the general public

- Recognise the value of nature to health and well-being.
- Participate in 'citizen science' projects and nature conservation action on the ground.
- Encourage areas of natural habitat in gardens and local environment, including areas of water, grassland, scrub and trees.
- If you have your own garden, opt for grass rather than concrete or anything artificial, and if you have a lawn, leave areas of long grass to increase biodiversity.
- Reduce the use of chemical pesticides wherever practical and avoid the introduction and spread of invasive non-native species (INNS).
- Follow good practice for preventing the spread of plant pests and diseases.
- Find out more about alternatives to toxic chemicals for the garden.
- Use peat-free compost and find out more ways to protect soil at home.
- Learn more about Welsh coasts and seas, the impact of our collective and individual actions on the oceans' health and how the oceans' health impacts our everyday lives.
- Understand more about opportunities for farmers and landowners to engage in habitat and peatland restoration and sustainable management.

### Our ask of strategic partner bodies

- Work with us to deliver the priorities in our Natural Resources Policy and our statutory biodiversity targets.
- NRW, Animal and Plant Health Agency (APHA) and Forestry Commission (FC) to continue to monitor and develop preventative measures for responding to plant and tree pest and disease outbreaks.

### Our ask of the public sector

- Restore and sustainably manage habitats and peatlands within own estate and ensure policies relating to land use and development control support this.
- Full participation in achieving the objectives of our [Natural Resources Policy](#) (including our biodiversity strategy).
- Contribute to the delivery of our statutory biodiversity targets.
- Meet the duty under s.6 of the Environment (Wales) Act 2016 to seek to maintain and enhance biodiversity, and in so doing promote the resilience of ecosystems, in carrying out their functions.
- Set objectives designed to maximise their contribution to achieving the goal of a Resilient Wales under the WFG Act, and take all reasonable steps to meet those objectives. A "Resilient Wales" is defined as "a nation which maintains and enhances a biodiverse natural environment with healthy functioning ecosystems".
- Meet the duty to take into account the [Welsh National Marine Plan](#) policies.
- Restore and sustainably manage habitats and peatlands within own estate and ensure policies relating to land use and development control support this.
- Adhere to and acknowledge the actions in the Plant Biosecurity Strategy, GB INNS Strategy and UK National Action Plan for the Sustainable Use of Pesticides (once published).
- Participate in existing and developing local nature and coastal partnerships, to ensure communities and broader stakeholders are engaged and capacity is developed and joined up.
- Participate in the [Coasts and Seas Partnership](#) to increase understanding of marine impacts, secure private and sustainable financing and build capacity through engagement, skills, training and diversifying the sector.
- Actively engage with communities to encourage participation, awareness raising and citizen science to maintain, expand and manage habitats.
- Work to build public awareness and engagement with nature as an essential part of good health and well-being.

### **Our ask of Welsh Business and Industry**

- › Restore and sustainably manage habitats and peat.
- › Deliver and utilise Nature-based Solutions through business and operational activities, both on land and at sea.
- › Procure all plants and trees in a bio-secure manner, and report any potential pests or diseases found.
- › Avoid development proposals that damage biodiversity or cause pollution. Fully mitigate or compensate at scale if economic or social need outweighs biodiversity protection and is unavoidable.
- › Support the protection and/or improvement of biodiversity on their own premises where possible (e.g. trees, ponds, bird boxes and wildlife areas).
- › Adhere to the Welsh National Marine Plan policies for any developments in the marine environment, including SOC\_11 – Resilience to Climate Change.
- › Participate in the Coasts and Seas Partnership to increase understanding of marine impacts, secure private and sustainable financing and build capacity through engagement, skills, training and diversifying the sector.
- › Consider contributing to the MARINE Fund Cymru.

### **Our ask of UK Government**

- › Provide greater clarity of HMRC / HM Treasury long term regulation, tax and investment arrangements for green finance initiatives.
- › Collaborate on science, monitoring and reporting and improved funding for nature resilience.
- › Maintain engagement and collaboration on tree and plant health through the [Plant Health Common Framework](#) and [Chemicals and Pesticides Common Framework](#).



## 5.2 Our Adaptation Action Plan for Agriculture

### Climate-related risks to agriculture

Welsh agriculture is at the heart of many of our rural communities. Our high standards in food and farming are key to our response to the climate emergency and our plans for enhancing biodiversity. This is reflected in our Sustainable Land Management objectives, enshrined in the [Agriculture \(Wales\) Act 2023](#), which also recognises the environmental, economic, cultural and social contribution of farmers in Wales. However, it is clear from analysis that future generations will be farming in much more challenging conditions and we must act today to adapt and mitigate this.

CCRA3-IA presents evidence on numerous risks to the Welsh agricultural sector, which farmers are already having to address and may rise in significance in future years. This includes changing climatic conditions and increasing weather extremes affecting Welsh soils, water resources, crops and livestock, both from intense and prolonged rainfall and flooding as well as recurring periods of summer droughts and wildfires. These conditions will also affect our habitats and biodiversity, which are so often maintained by agricultural practices. There is also the likelihood of an increase of pests, pathogens and invasive non-native species affecting agricultural productivity for crops and livestock and the consequential impact this can have on businesses and livelihoods, as well as our food security.

Along with these risks, the CCRA3-IA report also notes opportunities which climate change may present to Welsh agriculture including opportunities for new or alternative tree and crop species to become viable for forestry, agriculture and horticulture in Wales.

Mitigating these risks and responding to these new opportunities is essential for building climate resilience within Welsh agriculture and supporting the economic development of our rural communities. Our proposed Sustainable Farming Scheme (SFS) is being co-designed with farmers to meet many of the challenges of climate change, and we will work closely with farmers in developing appropriate support and sharing knowledge, data and innovation. The SFS framework is expected to be agreed early in 2025 and to include a set of Universal Actions applicable to all in the Scheme, whilst supporting enhancements through voluntary Optional and Collaborative Actions. The Welsh Government will work with and support farmers through this transition. We welcome the excellent work many farmers are already undertaking to respond to the climate and nature emergency. The challenge of climate change requires everyone to work together across geographic and sectoral boundaries, and collaboration is key if we are going to be successful and to ensure a just transition for our rural communities throughout the whole of Wales.

### Climate Adaptation Outcomes

## What does good look like?

### Climate resilient agricultural production:

Healthy and productive livestock with a good quality of life

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Minimal crop failure due to climate impacts

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Soil health protected and enhanced

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Pollinators and pest-predators protected and enhanced

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Increased on-farm water storage and reduced water abstraction

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Spread of pests, diseases and invasive non-native species managed and minimised

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Management of wildfire risks

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Reduced risk of flood to agricultural production

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## Welsh Government actions

No.	We will:	Timescale for delivery
<b>In our agriculture policy area:</b>		
61	Through our interim Habitat Wales Scheme (HWS), continue to protect habitat land previously under management in 2023 up to the full introduction of the Sustainable Farming Scheme (SFS), introduce additional habitat land, not currently under paid management, into sustainable land management prior to start of SFS, and maintain environmental support for common land. HWS is currently running through 2024 and 2025, prior to introduction of SFS.	2024-2026
62	Through the SFS, protect and enhance habitats on farms to benefit biodiversity, pollinators and in response to the nature and climate emergencies. As a proposed Universal Action of the scheme, we will be able to track uptake within the scheme and review its effect over the coming years.	Ongoing
63	Through the SFS, improve soil health and resilience to climate change through soil testing, management and nutrient planning, and protect soils from erosion and degradation through establishing a multispecies cover crop on all land uncropped over winter.	2026-2029 (implementation phase of the SFS) Ongoing
64	Through the SFS, maintain and increase woodlands on farm and support hedgerow maintenance, to provide shade and shelter for livestock during heatwaves and offer co-benefits such as natural flood management and habitat for pollinators and pest predators.	2026-2029 (implementation phase of the SFS) Ongoing
65	Using interventions such as the demo network and Advisory Service (using only quality assured, approved and suitably qualified advisors), continue to raise awareness of the impacts of climate change through the Knowledge Transfer Programme, <a href="#">Farming Connect</a> .	2023-2025 (current Farming Connect)
66	Support mental health and well-being for farmers concerned by the impacts of climate change through Farm Well Wales and rural charities such as RABI, Tir Dewi and DPJ Foundation. The Farm Liaison Service are also on hand to signpost or provide advice where appropriate.	Ongoing
67	Consider opportunities for promoting and supporting continuous learning and upskilling through our Sustainable Farming Scheme support and Farming Connect, as farmers adapt to climate change and develop new skills and as new technologies emerge.	Ongoing
68	Include support for farmers to mitigate against climate change and promote resilient farming methods as part of any future knowledge transfer, innovation and/or advisory service for farmers.	Ongoing

No.	We will:	Timescale for delivery
69	Explore the potential of capital support to harvest and manage water supplies, including creating new reservoirs or irrigation ponds, installing water harvesting and reuse equipment and installing clean and dirty water separation infrastructure. This will be subject to budget availability.	2026-2029 (implementation phase of the SFS) Ongoing
70	Continue to deliver Rural Investment Schemes such as Small Grants which is scheduled to run March 2026.	2024-2026 (current committed funding)
71	Continue to support agricultural technological solutions such as GPS for precision farming as part of our ongoing Small Grants – Efficiency Scheme (formerly Farm Business Grants under EU RDP). We will review evidence for new items which can help farmers become more resilient to climate change in line with our Agri Tech Action Plan, subject to budget availability, on an ongoing process.	Ongoing
72	Continue to support the agricultural sector in line with our Sustainable Land Management objectives, ensuring farmers are supported to respond to the climate and nature emergencies. We have already signalled our intention to provide up to £20m to help address agri pollution through our Nutrient Management Investment Scheme and Small Grant – Yard Coverings scheme in 2025-26 and beyond. We will seek to continue the provision of funding into the future to help farmers mitigate impacts on the environment, diversify, improve efficiencies and support production.	Ongoing
73	Review responses to our Barriers to Small Scale Horticulture Development in Wales report to consider the effectiveness of our planning system and consider how our rural investment schemes can continue to support horticulture. Review will take place in 2024, with consideration for changes in future years.	2024 and ongoing
74	Explore with the Wales Horticultural Alliance and Farming Connect Horticulture Support Project how best to support the Horticulture sector to become more climate resilient following feedback directly from the sector.	Ongoing
75	As part of the UK Market Monitoring Group, monitor the economic impacts on Welsh animal feed supplies and wider challenges to the industry in response to climate change and other global factors, taking action where possible to support Welsh agriculture.	Ongoing
76	Review evidence of likely scenarios and adaptation strategies available to Welsh farming to support policy teams and the industry in thinking about how to improve climate resilience on farms, whilst also mitigating greenhouse gas emissions with an aim to identify win-win actions.	2024-2026
77	As part of the SFS, ensure any data collection helps assess the extent and effectiveness of actions taken by farmers to adapt to the impact of climate change.	2026-2029 (implementation phase of the SFS)

No.	We will:	Timescale for delivery
<b>In our plant health policy area:</b>		
78	Include integrated Pest Management and good farm biosecurity as Universal Actions of the SFS, to help mitigate risks from new or existing pests and diseases.	2026-2029 (implementation phase of the SFS)
79	Continue to monitor and respond to plant health outbreaks in the agricultural sector in Wales.	Ongoing
80	Continue to operate contingency plans for invasive non-native terrestrial plants and invasive non-native terrestrial vertebrates. Continue to work with the other UK Governments and their delivery bodies to set standards for marketing and certification, including variety registration, of seed and other plant propagating material, and ensure these standards are upheld. The UK Plant Variety and Seeds regime encourages the development of new varieties of plants, with improved traits such as better disease resistance or drought tolerance.	Ongoing
81	Work with other UK governments to develop a UK Plant Varieties and Seeds Strategy. Part of the Strategy will focus on supporting governments' current and future objectives on climate change and food security.	Ongoing
<b>In our animal health policy area:</b>		
	The Office of the Chief Veterinary Officer (OCVO) will apply a 'One Health' approach to achieve:	
82	Dynamic, real-time assessment of threats to animal health and welfare from diseases in other countries. Many of these are influenced by climate change. For example, distribution and seasonality of disease vectors.	Ongoing
83	Passive (or scanning) and active surveillance of diseases and welfare threats of farmed animals in Wales, through the Veterinary Risk Group. Many of these are influenced by climate and/or weather.	Ongoing
84	Rapid, real-time risk assessment and risk management of new threats to public health and welfare, through the Human Animal Infections and Risk Surveillance (HAIRS) Group and close liaison with Public Health Wales (PHW) and the Health and Safety Executive (HSE). Also including close working with Food Safety Authority around managing threats to food safety.	Ongoing
85	Joint sponsorship of the surveillance of arthropod vectors of diseases of animals and people in Wales (e.g. ticks, midges, mosquitos).	Ongoing
86	Joint sponsorship of bodies that influence farm animal breeding, including breeding animals that are suited for a changing climate and resistant to the diseases that climate change can bring about.	Ongoing
87	Preparedness and response capability for exotic animal diseases which can also threaten the rural economy, public health, biodiversity and ecosystems.	Ongoing
88	Appropriate regulations and guidance to protect and enhance Animal Welfare standards in Wales – including consideration of changing environmental conditions and the potential need to refine housing and transport regulations.	Ongoing

No.	We will:	Timescale for delivery
<b>In our Energy policy area:</b>		
89	<p>Support opportunities for community energy projects and on-farm renewable energy projects to create a more resilient energy system to help safeguard power supplies for agriculture. Farming Connect is a service which provides farms in Wales with support and advice on such potential opportunities.</p> <p>See also section 5.13 <i>Our Adaptation Action Plan for Energy Supplies</i>.</p>	Ongoing
<b>In our Water and Flood Management policy areas:</b>		
90	Consider and address risks to farms within catchment flood management plans.	Ongoing
91	Continue to advise farmers of the need to take action in line with weather and flooding alerts, as part of our ongoing flood and extreme weather advice planning and general Farming Connect advice and support.	Ongoing
92	Continue to work with NRW in prioritising recommendations in their <a href="#">Flood Risk Management Plan</a> , including actions to be taken on farms, over the coming years. We will also review evidence for our guidance document (Welsh Government <a href="#">Flood and Coastal Erosion Risk Management: Adapting to Climate Change</a> ), which underpins this report in the coming years.	Ongoing
93	Deliver Nature-based Solutions in providing cost effective and efficient interventions to challenges such as flooding, and the risks posed by climate change on agricultural land.	Ongoing
94	Meet our Programme for Government (PfG) commitment to deliver nature-based flood management in all major river catchments to expand wetland and woodland habitats.	Ongoing
95	Continue the Natural Flood Management Accelerator Programme to reduce flood risk management using Nature-based Solutions.	Ongoing
96	Review Natural Flood Management (NFM) and Catchment mapping to support more innovative solutions.	Ongoing
97	<p>Integrate Nature-based Solutions and collaborative policy integration via Optional Actions within the SFS.</p> <p>See also section 2.9 which summarises our national policy approach to flood and coastal erosion risk management.</p>	Ongoing
<b>In our development planning policy area:</b>		
98	In line with Planning Policy Wales, ensure development planning protects 'best and most versatile agricultural land'.	Ongoing

#### **Our ask of the general public**

- › Eat a healthy, flexible diet according to sustainably sourced food availability and minimise food waste.

#### **Our ask of strategic partner bodies**

- › Continue to work with Welsh Government on climate resilience issues for agriculture.

#### **Our ask of the public sector**

- › Local Authorities, NHS and other Public Bodies to explore how they can support their farms, land and estates to adapt to climate change.
- › Animal and Plant Health Agency (APHA) to continue to monitor and respond to animal and plant pest and disease outbreaks.

#### **Our ask of Welsh Business and Industry**

- › Farming stakeholders, farm and horticultural businesses, processors, retailers and industry representatives to commit to becoming climate resilient and sustainable, including a commitment to support climate adaptation throughout supply chains, including farm input supply chains (for example animal feed, fertiliser and machinery).
- › Welsh universities to share knowledge and expertise to improve the health and welfare of livestock and plants in the context of climate change.

#### **Our ask of UK Government**

- › Ensure UK-level research and development considers agriculture's dependencies on internationally sourced feed and fertiliser inputs and how these could change under various climate scenarios and develop plans, in collaboration with devolved governments.
- › Ensure future technology, research and development focuses on the future needs of and opportunities in farming in the context of climate change and the need for innovative approaches to farming (e.g. Controlled Environment Agriculture, genetic diversity and resilience, resilient crops and livestock, horizon scanning for new threats and opportunities).
- › Ensure that weather warning systems are in place and accessible to alert farmers and rural communities to extreme weather events.
- › Ensure the UK Government pushes for firmer commitments on provisions improving environmental and animal welfare standards in all Free Trade Agreement negotiations.

## 5.3 Our Adaptation Action Plan for Forestry and woodland

### Climate-related risks to forestry and woodland

The Climate Change Committee's (CCC) 2021 UK climate risk evidence (CCRA3-IA) highlights risks to forestry arising from extreme weather events and changing climatic conditions (including temperature change, water scarcity, wildfire, flooding, coastal erosion, wind and saline intrusion) and from pests, pathogens and invasive species. Forestry productivity may also be affected by climate-related impacts to soils due to seasonal aridity and wetness. Risks to forestry, woodland and soils also represent a risk to our plans to achieve net zero greenhouse gas emissions, due to their function as natural carbon stores which sequester carbon from the atmosphere. The CCRA3-IA also refers to potential opportunities arising from new or alternative species becoming suitable. It is important that the forestry sector plans for these areas of risk and opportunity to ensure sustainability of the sector in the context of climate change, especially given the relatively long-term planning cycles involved.

We recognise that forestry and woodland provide essential ecosystem services beyond timber production, including their biodiversity value as woodland ecosystems and their amenity and landscape value. While this action plan is particularly focussed on delivering climate resilient forestry productivity, the adaptation action plans in the other sections cover wider functions of woodland, including section 5.1 our adaptation action plan for nature.

### Climate Adaptation Outcomes

## What does good look like?

### Climate resilient forests and woodland:

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Reduce tree crop failure due to climate impacts

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Soil health protected and enhanced

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Good water quality and reduced risk of flooding

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Extended and enhanced areas of genetically diverse, climate-appropriate, ecologically-suitable tree species

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Managed and minimised spread of pests, diseases and invasive species

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Sustainable timber industry

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Maintained and increased productive tree cover in Wales

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Improved condition and resilience of woodland

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## Welsh Government actions

No.	We will:	Timescale for delivery
<b>In our forestry policy area:</b>		
99	Continue to ensure that woodland creation support is available for both productive woodland and those with a wider range of environmental and ecosystem services. Ensure that support encourages mixed woodland and species diversification, and that all woodland creation proposals occur in appropriate places and sensitivities are avoided or mitigated through woodland design, through the verification of all Welsh Government funded woodland creation proposals and through the Forestry Environmental Impact Assessment (EIA) screening of planting proposals (undertaken by NRW).	Ongoing as part of the approval process for grants and felling licences
100	Continue to use the <a href="#">Woodland Opportunity Map</a> to encourage woodland creation in areas where ecosystem services are maximised, such as air pollution interception, water quality; flooding; expanding and better connect the woodland habitat network and social benefits such as improved mental health and access to green space. Datasets for other benefits such as carbon sequestration and tree suitability will also be applied.	Ongoing
101	Continue to require compliance with the UK Forestry Standard (UKFS), the government's standard for sustainable forestry, for all Welsh Government funded woodland creation proposals and felling licence approvals. The Standard includes requirements for soil, water, biodiversity, landscape, historic environment, people and climate change and encourages greater tree species diversity in new planting and restocking to help forests to be more resilient to the impacts of climate change.	Ongoing
102	Consider the development of support for woodland management to encourage unmanaged woodland into production, improving timber quality and condition of woodland habitat, and increase the resilience of existing productive forests to the impacts of climate change.	Ongoing
103	Promote UKFS Best Practice Guides relevant to climate change, and <a href="#">Forest Research's Climate Change Hub</a> to the wider forestry sector to encourage engagement. Current relevant guides include <a href="#">Adapting Forest and Woodland Management to the changing climate</a> ; <a href="#">Designing and managing forests and woodlands to reduce flood risk</a> ; <a href="#">Building wildfire resilience into forest management planning</a> . The Hub provides resources and tools to help forest managers adapt forest and management practices to better cope with climate change. Forest Research is the research agency of the Forestry Commission and Great Britain's principal organisation for forestry and tree-related research.	Ongoing
104	Continue to engage with Forest Research on the delivery of their Science and Innovation Strategy, which includes research into alternative tree species and adaptation of forest management practices to improve forest resilience to climate change.	Ongoing
105	Develop national guidance on the approach to afforested deep peat.	Ongoing



No.	We will:	Timescale for delivery
<b>In our plant health policy area:</b>		
106	Prepare for plant and tree health outbreaks, through a Generic Contingency Plan for Wales.	Ongoing
107	Work with APHA, NRW, Forestry Commission and Forest Research, to monitor and respond to plant and tree health outbreaks in Wales.	Ongoing
108	Ensure surveillance networks are in place for plant and tree health pest and diseases so that we have early warning of their presence and can respond swiftly.	Ongoing
<b>In our emergency preparedness policy area:</b>		
109	Continue to support a multi-agency response to fire risk management, working alongside the Fire and Rescue Service, the Police, Natural Resources Wales, Public Health Wales, the National Park authorities, the Met Office and other relevant stakeholders. This includes consideration of strategic wildfire risks and their mitigation via the Wales Wildfire Board, and sharing of tactical and operational intelligence during the peak wildfire season, via Operation Dawns Glaw (an all-Wales multi-agency task force which aims to address risks related to deliberately set grass fires).	Ongoing
<b>In our agriculture policy area:</b>		
110	Consider options for extending and enhancing areas of genetically diverse, climate-appropriate, ecologically-suitable tree species through the Sustainable Farming Scheme.	Ongoing
111	Reduce agricultural pollution, to improve the health and resilience of our woodland ecosystems and reduce greenhouse gas emissions. We will achieve this through a range of interventions aligned to the SFS, including regulations, advice and guidance and working with the Wales Land Management Forum (WLMF) sub-group on agricultural pollution and other key stakeholders. (The WLMF is a group aiming to provide opportunities for NRW and other organisations to share information, identify common interests and work together on strategic land management issues.)	Ongoing
<b>In our nature and other policy areas:</b>		
	See also section 5.1 our <i>Adaptation Action Plan for Nature</i> , which is focussed on delivering climate resilient species and ecosystems, including woodlands.	

### Our ask of the general public

- › Recognise the value of trees and woodland including conifer forests and urban trees.
- › Engage in community tree planting or management projects.
- › Report illegal felling to NRW.
- › Report plant and tree pests and diseases using [Tree Alert](#).
- › Read tips on how to help prevent wildfires, and what to do during and after a wildfire on the [British Red Cross](#) website. Get tips to prevent forest fires.

### Our ask of strategic partner bodies

- › Continue to work with the Welsh Government to protect and expand woodland in Wales.
- › In line with the Role and Purpose of the Welsh Government Woodland Estate (WGWE), we ask Natural Resources Wales (NRW) to continue to:
  - Sustainably manage the WGWE as evidenced by independent forest certification;
  - Manage the WGWE to improve its extent, condition, diversity and connectivity, allowing it to adapt to extreme weather events, predicted climatic change and improve its resilience to pests and diseases;
  - Maintain, conserve and if appropriate enhance the biodiversity of the WGWE;
  - Undertake prioritised programmes of restoration of Plantations on Ancient Woodland Sites (PAWS) and afforested deep peat on the WGWE.

### Our ask of the public sector

- › Local Authorities to:
  - Actively engage in the protection of woodland against illegal felling e.g. through Tree Preservation Orders and work with NRW to identify potentially illegal pre-emptive felling in relation to planning applications.
  - Raise awareness of penalties for illegal felling on their websites;
  - Fully consider and implement Planning Policy Wales in relation to trees and woodland.
- › Manage and expand woodland cover including urban trees.
- › Manage and expand woodland on their estates e.g. NHS trusts, with consideration of climate risk and resilience. Welsh Plant Health services to continue to monitor, prepare and respond to plant and tree pest and disease outbreaks when they occur.

### Our ask of Welsh Business and Industry

- › Apply a proactive approach and integrated thinking from growing trees to end use of timber.
- › Agriculture sector to consider the benefits of integrating woodland into the farm business and manage existing woodland to increase timber quality/habitat condition/ woodland resilience.

### Our ask of UK Government

- › Collaborative approach to addressing climate risks to forestry, including shared research.

## 5.4 Our Adaptation Action Plan for Fisheries and Aquaculture

### **Climate-related risks to fisheries and aquaculture**

Freshwater and marine fish populations and fisheries and aquaculture activities are at risk from changing climatic conditions and extreme events, including higher water temperatures, flooding, water scarcity and changing weather patterns.

Climate change is adding to existing pressures facing the marine environment and ecosystems. Extreme weather events and flooding can impact on water quality in both freshwater and marine environments. In some areas water quality is also at risk from other industries and public actions.

A rise in water temperature is already causing shifts in the distribution of fish and shellfish around Wales which is reducing the abundance of cold-water species. There is also an increase in frequency and severity of potentially harmful algal blooms. This is accompanied by an increase in warmer water species such as blue fin tuna. (Pinnegar et al. 2020). There may also be changing risks from invasive species which can impact habitats, fish disease, predation and competition which can directly affect fisheries and aquaculture operations and the communities that rely on them. Natural Resources Wales leads on freshwater fisheries policy in Wales.

### **Climate Adaptation Outcomes**

## **What does good look like?**

### **Climate resilient fisheries and aquaculture:**

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Healthy, resilient fish stocks and aquaculture activities

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Good quality freshwater, marine and estuarine waters

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Fishing and aquaculture practices adapted to changes in water temperatures and acidification

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Managed and minimised spread of pests, diseases and invasive species

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## Welsh Government actions

No.	We will:	Timescale for delivery
<b>In our fisheries and aquaculture policy area:</b>		
112	Collate evidence of climate change from a variety of sources and assess and monitor the impact on fisheries and aquaculture activities and the communities that rely on them, using the information to inform policy decisions.	Annually and on availability of evidence
113	Develop, and contribute to the development of Fisheries Management Plans (FMPs) for key species to maintain sustainable stocks considering impacts of climate change and manage the risk of overfishing on those species through adaptive management measures. The timetable for FMP development in relation to Wales is set in the Joint Fisheries Statement <a href="#">List of fisheries management plans (FMPs)</a> .	Crab and Lobster FMP to be published in 2026
114	Monitor changes in species populations through existing stock surveys and examine any correlations with water temperature changes or water quality. Stock surveys are carried out on key species by Welsh Government as part of ongoing fisheries management. Information will be used to ensure sustainable management of fisheries.	Annual and biennial stock surveys
115	Through the development of an Ocean Literacy Strategy, set out our plan to increase society's understanding of the benefits to their well-being of the ocean, their impacts on the ocean and the actions they can take to improve its resilience.	Strategy to be published in 2024
116	Responsibly manage populations of warmer water species if they migrate into Welsh water, and provide sustainable fishing opportunities for commercially valuable species if appropriate. Actions will be based on evidence of stock distribution and prey availability provided by the Marine Climate Change Impacts Partnership (which is an independent source of marine climate change impacts evidence and adaptation advice in the UK).	When the opportunity presents
<b>In our water resources policy area:</b>		
	Work with water companies to:	
117	Define and deliver water resource management plans to meet the challenges of climate change.	Ongoing
118	Deliver the Welsh Government's <a href="#">Water Strategy</a> .	Ongoing
119	Deliver 2025-30 Business Plan (PR24) commitments on asset/infrastructure investment.	Ongoing

No.	We will:	Timescale for delivery
120	Work with members of the Wales Drought Liaison Group to plan the strategic direction for water resources management in Wales. (The group comprises water companies, NRW, the Met Office and other partners).	Ongoing
121	Respond effectively to incidents, such as extreme weather events.	Ongoing
122	Reduce sewer discharges that impact on the environment and aquatic life in fresh and marine water. See also section 5.6 <i>Our plan for Climate Resilient Water Quality and Supply</i> .	Ongoing
<b>In our agriculture policy area:</b>		
123	Reduce agricultural pollution which affects water quality, through a range of interventions, including financial support, regulations, advice and guidance and working with the Wales Land Management Forum sub-group on agricultural pollution and other key stakeholders.	Ongoing
<b>In our disused mines and spoil heaps management policy area:</b>		
124	Reduce run-off and leaching of heavy metals from disused mines and spoil heaps which bio-accumulates in shellfish.	Ongoing
<b>In our emergency preparedness policy area:</b>		
125	Ensure emergency response planning is in place for storm damage to vessels where there is a risk of oil or diesel spills.	Ongoing
<b>In our nature policy area:</b>		
	See section 5.1 <i>Our Adaptation Action Plan for Nature</i> which includes actions to address risks to marine and freshwater species and ecosystems.	

**Our ask of the general public**

- › Purchase sustainably produced seafood where available.

**Our ask of strategic partner bodies**

- › NRW to research into impacts of climate change on freshwater species and action to increase resilience by developing and implementing policies to protect freshwater environments.

**Our ask of the public sector**

- › Continue to monitor water quality around the Welsh coast, and to notify relevant bodies of any incidents or anomalies.
- › Allocate funding for data collection, monitoring, innovation, skills training, advisory services, and research and development in the fisheries sector to improve climate resilience.
- › Support the sustainable management of fish stocks.

**Our ask of UK Government**

- › Greater collaboration on flood prevention.
- › Greater collaboration on data collection, monitoring, innovation, skills training, advisory services, and research and development in the fisheries sector to improve climate resilience.

**Our ask of Welsh Business and Industry**

- › Maintain drainage systems and invest in new and upgraded sewage treatment facilities.
- › Use responsible agricultural practices for slurry, manure and poultry litter applications and responsible disposal of sprays and chemicals.
- › Invest and operate in ways that support the delivery of the 'just transition and green prosperity' key priority of the [Economic Mission](#) (the Welsh Government's priorities for building a more prosperous, equal, and greener economy).
- › Adhere to the Welsh National Marine Plan policies for any developments in the marine environment, including SOC\_11 – Resilience to Climate Change.

## 5.5 Our Adaptation Action Plan for Food Security

### Climate-related risks to food security

Food security, as defined by the United Nations' Committee on World Food Security, entails ensuring that all individuals, at all times, have physical, social and economic access to sufficient, safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life.

The *IPCC Special Report on Climate Change and Land: Food Security* states that the impacts of climate change are already affecting our food security. The main risks identified include extreme weather events, floods, droughts, rising sea levels, warming oceans, pests and diseases. These factors can seriously harm food production (i.e. horticulture, farming, fisheries and the food industry), power supply systems and food supply chains including transportation, distribution, and storage. Since food security relies on many different factors to work well, it is important to have a co-ordinated plan that covers adaptation measures across all these areas.

Climate change adds to the pressure on the food system which is already affected by other challenges, such as global conflicts, growing population, and economic challenges, further exacerbating the threats to food security. The recent cost of living crisis has heightened concerns about the affordability and accessibility of essential food items. Latest data from the Department for Work and Pensions [Family Resources Survey](#) estimate that 10% of households in Wales experienced food insecurity (financial year ending March 2023), and climate change may exacerbate this in the future. There is evidence of people being unable to afford enough food and/or sustain a healthy diet. The Broken Plate 2023 report from the Food Foundation concluded that the most deprived fifth of the UK population would need to spend 50 per cent of their disposable income on food to meet the cost of the Government recommended healthy diet. We have a range of programmes already in place to tackle food poverty such as [Families First](#), Local Food Partnerships and [Parenting: Give it Time](#).

### Climate Adaptation Outcomes

## What does good look like?

### Minimal climate-related disruption to food and feed supply chains:

Climate-related risks to food security and standards are considered within UK trade agreements

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Reduced supply chain risks through capacity building, diversification, and other contingency planning

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### Reduced vulnerability to food price shocks from climate impacts:

Minimal impacts upon household food affordability and nutritional content

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## Welsh Government actions

No.	We will:	Timescale for delivery
<b>In our food policy area:</b>		
126	Carry out baseline research on the impact of climate change on food security in the UK and globally.	2024
127	Consider the potential benefits and drawbacks of mandating climate risk and adaptation reporting for large food and feed businesses. Any potential actions stemming from the research would be implemented in subsequent years.	2024-25
128	Review the NHS Wales central food store model and consider whether this could be improved in terms of addressing climate-related risks.	2025
129	Develop Climate Adaptation and Resilience training and workbook for the Food and Drink Industry in Wales. This will include supporting businesses to complete climate risk assessments.	2024-26
130	Develop and promote Climate Resilience guidance for food and drink retailers.	2024
131	Provide sustainability training, supported by a practical handbook, to food and drink manufacturers in Wales, to include climate change adaptation.	2024-26
132	Promote community food redistribution programmes to Food and Drink manufacturers in Wales via targeted communication to increase food supply resilience, including sharing case studies and engagement with the media.	Ongoing
133	Publish a Community Food Strategy for Wales, which will include consideration of climate-related risks to food supplies.	End of 2024
134	Work with key partners to explore options that could potentially increase the adoption of new technologies and innovation within the Food and Drink industry in Wales, while carefully considering the benefits and implications of such advancements.	Ongoing
<b>In our circular economy and resource efficiency policy area:</b>		
135	Use the data published within the <a href="#">Household Food and Drink Waste in Wales 2021-2022 report</a> to inform policy interventions to help households make the most of the food they buy and prevent edible household food waste (83% of household food waste could have been eaten). Specifically in 2024-25 it will be used to inform the <a href="#">Be Mighty campaign</a> , which is focusing on food waste prevention and food waste recycling and it will also be used to keep the <a href="#">Climate Action Wales</a> reducing food waste pages up-to-date.	Oct 2024 and Feb 2025 [re Be Mighty Campaign] Ongoing [re CAW]
136	Contribute funding and support towards <a href="#">Fare Share Cymru</a> to build capacity to access, process and distribute greater quantities of good food surplus.	Current scheme up to March 2025
137	Continue to fund <a href="#">Love Food, Hate waste</a> – aiming to help householders make the most of the food that they buy.	Ongoing



No.	We will:	Timescale for delivery
<b>In our energy policy area:</b>		
	Resilient energy supplies are essential to the food sector. See also section 5.13 <i>Our Adaptation Action Plan for Energy Supply</i> .	
<b>In our Telecoms and ICT policy area:</b>		
	Resilient Telecoms and ICT are essential to the food sector. See also section 5.14 <i>Our Adaptation Action Plan for Telecoms and ICT</i> .	
<b>In our transport policy area:</b>		
	The functioning of the food supply chain relies on an efficient transport network for distribution, with much of the UK food supply chain dependent upon the use of 'just-in-time' logistics. See also section 5.9 <i>Our Adaptation Action Plan for Transport</i> .	
<b>In our water resources policy area:</b>		
	The agri-food industry relies on water supplies for agriculture and to food and drink production. See also section 5.6 <i>Our Adaptation Action Plan for Water Quality and Supply</i> .	
<b>In our flood and coastal erosion policy area:</b>		
	Flooding and coastal erosion pose significant risks to food security in Wales due to their potential impact on agricultural land, infrastructure, food production facilities and distribution networks. Further information on our strategic approach to flood and coastal erosion risk management can be found in section 2.9.	
<b>In our fisheries and aquaculture policy area:</b>		
	Fisheries and aquaculture are key to food security. See also section 5.4 <i>Our Adaptation Action Plan for Fisheries and Aquaculture</i> .	
<b>In our agriculture policy area:</b>		
	See section 5.2 <i>Our Adaptation Action Plan for Agriculture</i> . See also section 2.5 on our "One Health" approach to tackling interdependent risks to human, animal and planetary health.	
<b>In our nature policy area:</b>		
	See section 5.1 <i>Our Adaptation Action Plan for Nature</i> which includes actions to address risks to marine and freshwater species and ecosystems.	

**Our ask of the general public**

- › Eat a healthy, flexible diet according to sustainably sourced food availability.
- › Consider food sustainability in your weekly shop and buy sustainably produced seafood where available.
- › Minimise food waste.
- › Teach children the importance of healthy and sustainable foods.

**Our ask of strategic partner bodies**

- › Food Standards Agency and Farm Assurance Providers to work with government to ensure food is produced, processed and sold in a safe and efficient manner, with consideration of climate-related risks.

**Our ask of the public sector**

- › Consider food supply resilience and sustainability in their operations e.g. procurement of food for schools, hospitals, canteens etc.
- › Public bodies and Public Service Boards to consider the local food system in their statutory well-being plans.

**Our ask of UK Government**

- › Consider supply chain resilience in trade deals.
- › Consider climate resilience and contingency planning for food retailers.

**Our ask of Welsh Business and Industry**

- › Develop and implement adaptation risk assessments and plans for their business.
- › Develop processes that are less vulnerable to impacts on resources at risk from climate change (e.g. water, energy).
- › Ensure their supply chains are resilient to climate-related shocks in the UK and overseas (e.g. consider where their ingredients come from).

## 5.6 Our Adaptation Action Plan for Water Quality and Supply

### **Climate-related risks to water quality and supply**

Water is one of our most precious natural resources and it is vital that we protect and preserve it. It is essential to our personal health, the functioning of our society, and the needs of our environment. Climate change means that Wales is facing wetter winters, hotter drier summers, and more frequent and intense extreme weather events such as flooding and drought. This is placing significant pressure on our water supplies and infrastructure, our ecosystems and habitats, and key sectors such as agriculture. We also need to ensure that water supply tariffs remain fair and affordable for all in the context of demands on water resources and investment in adaptation measures.

The water sector faces significant challenges: it must decarbonise, build climate resilience and reverse biodiversity loss, all against the backdrop of a cost-of-living crisis. We work closely with key partners at a Wales level (e.g. water companies, regulators and consumer representatives), and at UK-level to ensure the impacts of climate change on water are being addressed.

### **Climate Adaptation Outcomes**

## **What does good look like?**

### **Sufficient water for public supply:**

Water infrastructure protected from flooding, sea level rise and weather-related disruption.

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Water quality and supply protected from impacts of climate change.

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Robust incident response and evaluation frameworks.

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Reduced household demand and increased water use efficiency.

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Minimal leakage.

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### **Sufficient water for private supply:**

Interdependencies with other infrastructure identified and managed.

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## Welsh Government actions

No.	We will:	Timescale for delivery
<b>In our water resources policy area:</b>		
	Take measures to achieve good status in all water bodies in line with the <a href="#">Water Framework Directive</a> . This includes providing capital funding to tackle pollution from metal mines as well as other improvements in rivers throughout Wales:	
138	Work with the Drinking Water Inspectorate to ensure that water companies fulfil their legislative duties to safeguard water supply under business as usual and extreme/emergency conditions.	Ongoing
139	Work with stakeholder groups to deliver the objectives of the Wales Drought Liaison Group, namely the Welsh water companies, Met Office, NRW, CCW, Local Authorities, OFWAT, DWI, Farming Unions, Environmental NGOs' and Public Health Wales.	Ongoing
140	Work with UK Government departments, Devolved Governments and water industry bodies to share knowledge, insight and best practice to ensure the Welsh water industry operates, wherever possible, in harmony with the UK-wide water industry.	Ongoing
	Work in partnership with the water companies, Ofwat, Drinking Water Inspectorate and NRW to:	
141	Plan for more extreme levels of drought in future and ensure resilience measures are in place.	Ongoing
142	Maintain water quality (despite flooding events).	Ongoing
143	Reduce household usage of water.	Ongoing
144	Reduce leakage within water system.	Ongoing
145	Monitor and maintain reservoir infrastructure.	Ongoing
146	Monitor river, groundwater and aquifer levels and ensure sustainable and responsible water abstraction practices.	Ongoing
147	Reduce incidences of water and wastewater mains bursts.	Ongoing

No.	We will:	Timescale for delivery
	For improved drainage we will:	
148	Sustain and improve the current statutory Sustainable Drainage Solutions (SuDS) legislation implementation, acting on the prioritised recommendations from the 2023 SuDS review.	Ongoing
149	Use the expertise being developed in Wales to work with other public and private bodies to deliver genuinely multi-benefit solutions in partnership.	Ongoing
150	Use the developing SuDS knowledge in Wales to incorporate into proposals for Nature-based Solutions (NBS), working across different sectors to deliver the most sustainable solutions.	Ongoing
151	Provide funding and strategic support for local authority-led river catchment Nutrient Management Boards in Wales, to develop and implement Nutrient Management Plans for Special Areas of Conservation (SAC) rivers through the SAC Rivers Programme.	Ongoing
152	Continue to support NRW's work on the statutory Bathing Water Programme to provide the public with reassurance of the quality of water in designated bathing sites.	Ongoing
153	Support NRW to deliver our Programme for Government commitment to designate more inland waters and improve water quality.	Ongoing
<b>In our flood and coastal erosion policy area:</b>		
154	Deliver Nature-based Solutions in providing cost effective and efficient interventions to challenges such as flooding and the risks posed by climate change reducing run-off and pollution.	Ongoing
155	Deliver our Programme for Government commitment to deliver nature-based flood management in all major river catchments to expand wetland and woodland habitats, reducing demands on water supply for agriculture by creating ponds and dams.	Ongoing
156	Continue to deliver the Natural Flood Management Accelerator Programme to reduce flood risk management using innovative Nature-based Solutions to support flood and drought whilst protecting soil to reduce impact on food crops.	Ongoing
157	Review Natural Flood Management and Catchment mapping to support more innovative Nature-based Solutions and collaborative policy integration with Optional Actions within the Sustainable Farming Scheme.	Ongoing
158	Monitor Shoreline Management Plans to ensure early consideration of water assets.	Ongoing
159	Use flood mapping and asset mapping to help protect water infrastructure and supply.	Ongoing

No.	We will:	Timescale for delivery
<b>In our buildings policy area:</b>		
160	Ensure implementation of the Welsh Housing Quality Standard sections 3g and 3h in social housing. This includes water efficiency standards covering water usage and storage (where possible).	For the duration of the programme
<b>In our agriculture policy area:</b>		
161	Reduce agricultural pollution which affects water quality, through a range of interventions, including financial support, regulations, advice and guidance and working with the Wales Land Management Forum sub-group on agricultural pollution and other key stakeholders.	Ongoing

### Our ask of the general public

- › Manage water more efficiently and save water when you can (for example by trying a water meter and taking shorter showers).
- › Installing water butts outside to save water in the garden where possible.
- › Stop disposing of items such as wet wipes through the sewage system.
- › Reduce littering.

### Our ask of Welsh Business and Industry

- › Build water saving and water re-use and recovery measures into business plans.
- › Develop new techniques for efficient water use.
- › Apply Nature-based Solutions for managing water quality.
- › Develop and implement mitigation and restoration measures for any SACs they operate within, to reduce nutrient contamination levels.

### Water companies to:

- › Deliver investment and activity commitments set out in 2025-30 Business Plans (PR24), e.g. capital investment programme, wastewater investment, leakage reduction, acceleration of long-term metering programme, etc.
- › Deliver targets set out in 2024 Water Resource Management Plans, e.g. demand management, leakage, per capita consumption and resilience to drought.
- › Deliver commitments set out within [Drought Plan](#)

### Our ask of the public sector

- › Incorporate water efficiency measures into their policies, including innovative water re-use and recovery measures where relevant.
- › Work with other statutory agencies to ensure that further nutrient loading to SAC rivers is identified and delivered in accordance with the sustainable development principle.

### Local Authorities to:

- › Ensure their Nutrient Management Boards produce and deliver an actionable Nutrient Management Plan by April 2025.

- › Where planning proposals are dependent on an existing permit that represents a risk of deterioration in water quality, ensure that appropriate action is taken.
- › Ensure they deliver their regulatory responsibilities under Part 2a of the Environmental Protection Act 1990 in compiling their own records of known sites across their areas which may have been impacted by historical activities potentially causing pollution to the ground or groundwater.

- › Ensure that SuDS legislation is appropriately delivered, to sustainably manage new development in terms of flood risk, pollution, amenity and biodiversity.
- › Ensure that all licensed private water supplies are sampled and tested in accordance with regulatory duties.
- › Meet duties under the Bathing Water Regulations 2013 to clearly display the water quality classification at designated bathing sites and work with NRW to address pollution issues.

### Our ask of UK Government

- › Work with the Welsh Government to introduce legislation for statutory water efficiency labelling.
- › Work with the Welsh Government on joint research projects that affect cross border river catchments.
- › Continue to work with the Welsh Government to share best practice, knowledge and insight to ensure that the Welsh water sector policy and standards are, wherever possible, aligned with the UK water sector.

## 5.7 Our Adaptation Action Plan for Health and Well-being

### **Climate-related impacts to health and well-being**

As set out in section 2.5, human health is inextricably linked to the health of the planet, with climate change regarded by the World Health Organisation (WHO) as the “single biggest health threat facing humanity” impacting the “essential ingredients of good health – clean air, safe drinking water, nutritious food supply and safe shelter” and widening existing health inequalities.

Inequalities in health arise because of inequalities in society and the conditions in which people are born, grow, live, work and age. These lead to health inequity; unfair and unjust systematic differences in people’s health and well-being. They are socially determined by circumstances largely beyond an individual’s control, disadvantaging people and limiting their chance to live longer, healthier lives.

The building blocks for good health are usually referred to as the wider determinants of health. They include education and skills, a warm safe home, fair work, money and resources, access to affordable and sustainable transport and healthy physical environments. These conditions and our inclusion with them, affect us from our earliest experiences and throughout our lifetime. Different experiences of, and levels of inclusion with, these determinants create health inequalities that lead to differences in health outcomes, resulting in those in the least deprived areas in Wales living longer and healthier lives than those in the most deprived.

This chapter sets out the actions needed by the health and social care system in Wales to respond to the risks and opportunities from climate change to ensure the resilience of population health and well-being, and health and social care delivery. It also sets out the actions needed by a wide range of sectors and players whose activities directly or indirectly impact the health and well-being of the people of Wales.

### **Climate Adaptation Outcomes**

#### **What does good look like?**

##### **People are protected from the health impacts of climate change and any potential benefits are utilised:**

Minimised mortality, morbidity, and mental ill-health impacts from heat, storms and flooding.

Climate-sensitive disease prevalence predicted and addressed.

Potential mental and physical health benefits realised from more time spent outdoors due to warmer temperatures.

Minimised health impacts from indoor and outdoor air and other environmental quality changes.

##### **Quality and accessible health and social care delivery during extreme weather:**

Overheating prevented in primary and community care, hospitals and care home settings.

Minimal disruption to health and social care delivery due to storms and flooding.

Climate resilient supply chains for health and social care.

Minimal impacts on the health, safety and mental well-being of the health and social care workforce in the context of climate related changes to the working environment.



## Welsh Government actions

We know that our physical, social and economic environment has a significant impact on our health and well-being. Increasing the climate resilience of the places and communities in which we live and work will positively impact population health and well-being, helping to reduce inequalities.

All policy and decision-makers should consider and apply [Public Health Wales' Health Impact Assessment of climate change in Wales](#) when developing climate adaptation plans and effect change to ensure current and future health and well-being impacts of climate change are fully embedded in decision-making and any co-benefits to health maximised.

No.	We will:	Timescale for delivery
<b>In our health and social care policy areas:</b>		
	Implement <a href="#">A Healthier Wales (AHW)</a> , the overarching strategy for the health and social care system in Wales, which includes key commitments to ensure environmental sustainability and health climate resilience is embedded in objectives, decision-making and plans.  Deliver commitments under the WFG Act, supporting the delivery of AHW and this National Adaptation Strategy, including the following key enabling actions:	
162	Publication of the Public Health Wales (PHW) Health impacts of Climate Change Health Impact Assessment.	Published 2023
163	Working with PHW to develop and improve climate and health surveillance systems to advance understanding, generate evidence and inform climate risk and opportunity assessments, planning and actions.	Ongoing
164	Publishing <a href="#">Climate Adaptation Guidance and a Toolkit</a> for Health and Social Care organisations in Wales to provide strategic direction on Adaptation and practical tools to support the development and implementation of climate focused health and well-being risk and opportunity assessments.	2024
165	Evolving climate response plans across Health and Social Care, drawing on lessons learned to date and ensuring a joined-up approach between mitigation and adaptation, ensuring our route to Net Zero fully recognizes the need to ensure long-term health and social care resilience, and service delivery impacts of climate change.	Ongoing
166	Developing and implementing a health and social care adaptation indicator suite in line with the CCC's recommendations.	Ongoing
<b>In our buildings policy area:</b>		
	There are significant mental, physical health and well-being risks arising from heat, storms and flooding in residential and non-residential buildings.  See section 5.10, <i>Our Adaptation Action Plan for Buildings</i> .	

No.	We will:	Timescale for delivery
<b>In our animal health policy area:</b>		
	Take a 'One Health' approach to manage the risk of climate-related changes to diseases, including risks of infections transferring from animals to humans, including:	
167	<p>Working with Public Health Wales and other partners to improve:</p> <ul style="list-style-type: none"> <li>– surveillance of diseases potentially capable of infecting humans</li> <li>– Dynamic, real-time assessment of threats to health from diseases in other countries. Many of these are influenced by climate change. For example, distribution and seasonality of disease vectors.</li> </ul> <p>See also section 5.2 <i>Our Adaptation Action Plan for Agriculture</i>.</p>	Ongoing
<b>In our development planning policy area:</b>		
168	Ensure our communities benefit from healthy environments and physical, mental health and well-being is protected, particularly for people and communities most exposed to climate risks or already experiencing disadvantage or marginalisation. This will include identifying opportunities to take actions that address respiratory conditions, inactivity, and mental health. These include improving air quality, increasing green space and tree cover and improving public access to green infrastructure.	Ongoing
169	<p>Support communities to improve the places where they live and work, tackling local environmental issues and building resilience to climate change.</p> <p>See section 5.11 for <i>Our Adaptation Action Plan for Towns, Cities and Rural Communities</i>.</p>	Ongoing
<b>In our nature, culture and historic environment policy areas:</b>		
170	<p>Engage individuals and local communities using nature, cultural and historic assets to empower people to take positive adaptation action and improve their physical and mental health and well-being.</p> <p>See section 5.1 <i>Our Adaptation Action Plan for Nature</i></p> <p>See section 5.12 <i>Our Adaptation Action Plan for Culture and Historic Environment</i>.</p>	Ongoing
<b>In our Agriculture and Food Security policy areas:</b>		
	Our agriculture and food sectors play an important role in the provision of sustainably produced and resilient food supplies for the people of Wales. See section 5.2 <i>Our Adaptation Action Plan for Agriculture</i> and section 5.5 <i>Our Adaptation Action Plan for Food Security</i> .	

### Our ask of the general public

- › Visit [Climate Action Wales](#) and explore the collection of inspiring stories and useful tips on how we can minimise the risk to our health and build resilience within our homes and communities to the impacts of climate change. You can also learn more about the benefits of climate action from saving money, improving our health and well-being, safeguarding nature, and helping our local communities to thrive.
- › Follow advice/guidance issued by Public Health Wales on the mental and physical health impacts of storms and flooding and, where you can, support those who may be more vulnerable to those impacts.
- › Protect yourself and others from the effects of too much heat and sun. See the Public Health Wales website for more information on how to stay out of the heat, cool down, and keep your environment at a comfortable temperature, and how to help those who may be more vulnerable such as people with underlying health conditions.
- › Keep animals safe in hot weather. (See RSPCA tips for keeping animals safe and comfortable during a heatwave.)

### Our ask of the Health and Social Care Sector

- › All Health and Social Care Organisations to develop, publish and implement Climate Response Plans covering emissions reduction and adaptation planning. Plans should be approved and progress monitored at Board (or equivalent) level and should demonstrate visible system leadership on:
  - › How climate considerations are being embedded within objectives, decision-making and plans at all levels and across supply chains.
  - › Actions in response to priority areas of emissions reduction (including procurement, reducing waste and the use of environmentally harmful inhalers and medical gases) and climate risks and opportunities to health, and health service delivery.
- › Actions to make existing health and social care buildings more resilient to climate change impacts, particularly heat, storms and flooding, and ensure that new buildings are designed to meet future climate challenges.
- › Working in collaboration across the health and social care system and wider public sector (including through Public Services Boards) to evolve plans, share best practice, skills and experience, with a focus on protecting those who are most exposed to climate risk or have less means available to manage impacts, actively addressing inequalities in the communities served.
- › PHW to develop and improve climate and health surveillance systems to advance understanding, generate evidence and inform climate risk and opportunity assessments, planning and actions.

### **Our ask of Welsh Business and Industry**

- › Consider and apply the PHW Climate Health Impact Assessment across decision-making, with a particular focus on protecting those most at risk.
- › Plan for climate impacts including for increased heat, storms and flooding and the disruption to infrastructure that may affect their operations and the health, well-being and productivity of their workforce.
- › Engage with the Health and Safety Executive, external experts and stakeholders to continue to promote health and safety initiatives to ensure indoor and outdoor workers are getting up to date and relevant health advice.

### **Our ask of the public sector**

- › Consider and apply the [PHW Health Impact Assessment of climate change](#) in Wales across decision-making, with a particular focus on those most at risk.
- › Collaborate, co-deliver and share best practice on adaptation planning and implementation through participation in Public Services Boards.
- › Develop local climate risk and opportunity assessments and adaptation plans in partnership with the Health and Social Care Sector, with a focus on protecting those who are most exposed to climate risk and / or have the least resilience to manage impacts and actively addressing inequalities in the communities served.
- › Enhance prevention and public involvement via targeted communications and education that includes consideration of the risks and opportunities to health and well-being, and health service delivery, from climate change.
- › Engage local communities using nature, cultural and historic assets to empower people to learn from the past, take positive adaptation action and improve health and well-being.

### **Our ask of UK Government**

- › Continued engagement in relation to legislation, data gathering, sharing, analysis and publication of UK strategies and reports that benefit the health and well-being of the United Kingdom.

## 5.8 Our Adaptation Action Plan for Business

### Climate-related risks to business

Risks to Welsh businesses arising from climate change include:

- Increased frequency and severity of flooding and storms, with direct impacts to premises and workforce, and indirect impacts of disruption of services, communications and supply chains.
- Increased frequency and severity of droughts and high temperatures, including threats to water supplies, fire risks, communications, safe working conditions and productivity.
- Wider climate-related disruption to the provision of essential services such as utilities and transport, which may also affect business resilience and productivity.

It is important that all Welsh businesses take appropriate steps to assess the extent of any climate-related risks to their workforce, assets and operations, to address these as much as possible and also take advantage of potential opportunities arising from climate change.

It is important that businesses can import and export goods, workers and essential services. Adaptation to make networks more resilient will be the responsibility of a range of parties, including the Welsh Government, local authorities, rail companies and others. Specifically with regards to road transport, it is important that actions arising from the [Roads Review](#) include consideration of adaptation to climate impacts, notably flooding. This is important for communication between settlements and businesses in areas of high risk of flooding and in designing and planning new roads to serve, for example, Freeports. Climate resilience plans for energy, water and transport need to focus on continuity of services for businesses during weather extremes. This includes energy for heating and cooling, supply of clean water and removal of wastewater and road/rail access.

### Climate Adaptation Outcomes

## What does good look like?

### Business sites, assets and workforce are protected from climate impacts:

Public and private adaptation measures implemented to minimise risks to businesses.

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Minimal productivity losses due to high temperatures and weather-related disruption.

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Businesses have access to capital and insurance including for adaptation.

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### Supply chain risks and opportunities are identified and managed:

Businesses have supply chain resilience plans in place.

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Opportunities for UK exports of climate adaptation goods and services are maximised.

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## Welsh Government actions

No.	We will:	Timescale for delivery
<b>In our business and economy policy area:</b>		
171	Continue to provide a package of support to those businesses developing and delivering climate adaptation goods and services to export through our ongoing implementation of the <a href="#">Export Action Plan for Wales</a> , a Programme for Government commitment. Support for eligible businesses includes: Support from our team of WG International Trade Advisors alongside our WG Overseas teams who continue to provide ongoing support for our exporters in key markets; The <a href="#">Export Hub</a> on the Business Wales platform; The Export Cluster programme; Programmes to assist exporters to find new customers; as well as Support to visit target markets through our Overseas Business Development Visit (OBDV) grant and the Welsh Government organised programme of overseas trade events/trade mission programme.	Current format of EAP is 2025-26 (future iteration to be confirmed)
172	Consider how existing business support services can help businesses prepare for climate change and reduce productivity losses.	Ongoing
173	Consider what further analysis might be needed on the resilience of supply-chains for Welsh businesses.	Ongoing
174	Explore funding mechanisms, including leveraging private sector finance, to support greater resilience to climate change impacts within the business sector.	Ongoing
175	Publish advice for businesses on climate change adaptation. We will also include a chapter on adaptation within our proposed Business Decarbonisation Brochure. Business Wales to develop advice and support services to help businesses adapt to climate change, including understanding risks and how to protect their assets, operations and workers from climate impacts	Ongoing
<b>In our development planning policy area:</b>		
176	Avoid poor developments putting businesses at risk, utilise <a href="#">TAN 15 advice</a> regarding development on flood plains, including consideration of flood risk from all sources.	Ongoing
177	Use Shoreline Management Plans and flood and coastal information to avoid inappropriate development or increased flood risk.	Ongoing
178	Map key business sites to allow future partnership measures to adapt to a changing climate and encourage wider funding initiatives.	Ongoing
<b>In our energy, water, transport, ICT and telecoms policy areas:</b>		
	There are significant business dependencies upon climate-resilient energy, water and transport, ICT and telecoms. See our adaptation action plans for these aspects set out in sections 5.6, 5.9, 5.13 and 5.14.	

### **Our ask of strategic partner bodies**

- › Natural Resources Wales (NRW) and utility companies to research and collate evidence about climate change impacts and set out how these might impact businesses (and others) spatially and temporally.
- › NRW and utility companies to invest in climate adaptation measures to ensure resilience in energy, clean water, wastewater, telecommunications in the face of climate impacts such as flooding, heat and drought.
- › Business Wales to develop advice and support services to help businesses adapt to climate change, including understanding risks and how to protect their assets, operations and workers from climate impacts.
- › Development Bank of Wales (and other banks/lenders) to support access to capital funding for climate adaptation and resilience.

### **Our ask of the public sector**

- › Work with business and industry to help make premises and operations resilient in the face of more extreme weather events.
- › Ensure land use management plans consider the risks of climate change impacts to businesses (and others).
- › Ensure climate resilience plans are in place for transport infrastructure and services. To ensure development planning for business premises takes account of the potential impacts of flooding and other severe weather impacts.

### **Our ask of Welsh Business and Industry**

- › Endeavour to make their activities and operations as resilient to extreme weather as practicable and plan for business continuity in the event of climate-related disruption. Plan for risks including flooding, water shortages and temperature extremes, a priority for commercial landlords and estate managers.

### **Our ask of UK Government**

- › Ensure adequate resources (financial, technical and co-ordination) are in place for business and industry to adapt to climate change.

## 5.9 Our Adaptation Action Plan for Transport

### Climate-related risks to transport

Wales needs our transport networks to function for daily life, economic activity, and the health and well-being of our communities. However, these are already regularly impacted by climate hazards including flooding, heat, subsidence, erosion and wind. The severity and frequency of these is projected to increase over the century causing further impacts. As our transport infrastructure has a long lifespan it is essential that we plan for the long term to adapt to these hazards so that our existing, retrofitted and new transport assets are robust and prepared for future climates.

Most sectors are reliant on a functioning transport network for the delivery of goods, supplies and resources, and it provides access for their staff to places of work. We must also consider that people living in lower-income households are relatively more likely to walk, cycle and use public transport systems to access education, training and work. Climate-resilient and affordable transport therefore has an important role to play in helping to address social justice.

Access is often time critical, especially for emergency services. There is therefore considerable risk for the transport network, and for others that rely on the transport network, from cascading risks. This could include how a single hazard, like a flood, can have a knock-on impact between sectors, for example by preventing access to key assets for energy and communication services or reduced mobility hindering timely medical interventions for healthcare.

### Climate Adaptation Outcomes

#### What does good look like?

#### **Transport networks and operations are resilient to extreme weather – roads, rail, airports and ports:**

Existing transport assets prepared for current and future climate risks and impacts.

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New infrastructure designed to be climate resilient and consider the most up-to-date/ appropriate climate data and scenarios.

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There are minimal impacts on transport networks from weather-related incidents.

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#### **Interdependencies are identified and managed:**

Interdependency risks (e.g. other transport, electricity, digital) included in climate risk assessments and adaptation plans for all key transport organisations.

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## Welsh Government actions

No.	We will:	Timescale for delivery
<b>In our transport policy area:</b>		
179	Consider the role of road, rail, airport, and port operators as part of any future arrangements for adaptation reporting in Wales. This could include asking them to conduct climate risk assessments that identify current and future climate change risks to services, based on UKCP18 projections, and create adaptation action plans or transition plans that address the high-risk areas that are identified in the risk assessment. These could also include appropriate contingency plans which address the needs of vulnerable users.	2025
180	Ensure that road, rail, international passenger airport and major port authorities conduct regular monitoring of climate risks and progress on resilience actions to improve maintenance practices.	2025
181	Engage with UK Government to designate transport sector regulators with consistent remits for climate resilience.	2030
182	Consider asking all transport operators to report on climate risks and resilience progress as part of our future approach to climate adaptation monitoring (see section 3.4).	2025
183	Facilitate collaboration and engagement between infrastructure owners/operators through convening a climate adaptation working group.	2025
184	Collaborate with the UK Government and other devolved administrations to develop codes and standards which include future climate scenarios and climate resilience (including existing, retrofitted and new assets). For new infrastructure, climate change adaptation and resilience should be embedded into planning standards and design to avoid costs of retrofitting in future.	2025
185	Enhance transport network resilience by developing a better understanding of cascade failures and impact on other sectors and users, by improving data sharing, and through the development of consistent indicators of network resilience.	2026
186	Ensure new developments and work to existing assets takes into account key policy, advice and strategies – for example that Ports adaptation measures will take into account Welsh National Marine Plan policy, TAN 15, and the <a href="#">Strategic Road Network (SRN) Nature Recovery Action Plan</a> .	2025
187	Review approaches to understanding the impacts of climate change and on valuing cost of climate risks to transport systems and assets to help demonstrate evidence to make the case for change.	2026
188	Introduce funding measures to consider wider benefits to cross policy measures and partnership funding allowing innovative solutions to mitigate climate-related risks.	2027

No.	We will:	Timescale for delivery
189	Continue to actively engage on innovation and research and development (including with the <a href="#">Transport Research and Innovation Board</a> and <a href="#">National Hub for Decarbonised Adaptable and Resilient Transport Infrastructure (DARe Hub)</a> )	Ongoing
<b>In our energy and ICT / telecoms policy areas:</b>		
<p>Our transport systems are increasingly dependent upon resilient energy supplies and ICT / telecoms. See our Adaptation Action Plans for these aspects in sections 5.13 and 5.14.</p> <p>See also section 2.9 which summarises our national strategic approach to flood and coastal erosion risk management.</p>		

### **Our ask of Transport Regulators**

- › Work with the Welsh Government to ensure that transport regulators consider and address climate resilience.

### **Our ask of the public sector**

#### **For the local road network we encourage Local Authorities to:**

- › Undertake asset level risk assessments for the local road network and use the findings to focus future investment and maintenance. Good practice would be to include mapping.
- › Adaptation reporting in line with any forthcoming arrangements to be confirmed by Welsh Government.
- › Monitoring: Collect and analyse data to inform ongoing maintenance practices.

#### **We encourage all key transport operators to:**

- › Develop climate risk assessments. Good practice would include consideration of organisational level climate resilience (e.g. learning from guidance on [Taskforce on Climate-Related Financial Disclosures](#)) and asset level climate adaptation.
- › Understand wider criticality and interdependence of the network. Develop criticality of transport network and knock on impacts on other services (e.g. for emergency services, waste collection, medical, care givers and community services, other infrastructure services).

- › Collect and analyse data to help monitor climate impacts on ongoing maintenance practices.
- › Undertake adaptation reporting in line with any forthcoming arrangements to be confirmed by Welsh Government.

### **Our ask of UK Government**

- › Collaborate with the devolved administrations to develop codes and standards which include future climate scenarios and climate resilience (existing, retrofitted and new assets).
- › Work with the Welsh Government to ensure that transport regulators have a consent remit for climate resilience.

## 5.10 Our Adaptation Action Plan for Buildings

### Climate-related risks to buildings

The main climate-related risks to buildings are related to summertime overheating, flooding, and building fabric vulnerabilities from heat, storms/wind, moisture/rain, etc.

Most of us spend much of our lives indoors and the quality of a person's indoor environment is a major determinant of their physical and mental health and well-being, over both the short and long term. Key indoor environmental attributes affecting health and well-being such as indoor air quality, thermal comfort and humidity may deteriorate for many people in the coming decades if buildings become unable to sustain healthy and comfortable indoor environments as a consequence of climate change.

We need to adapt our buildings to address the challenges of a changing climate. We must ensure that designers and developers future-proof the design of all new buildings/developments and improvements to existing buildings.

### Climate Adaptation Outcomes

#### What does good look like?

##### **New and existing buildings are well adapted to current and future climate:**

Overheating and moisture risk are prevented in residential and non-residential buildings.

Buildings protected from flood and other climate-related risks (subsidence, structural damage from storms, moisture and cold).

Planning systems are developed to consider adaptation requirements in residential and non-residential buildings.

Individuals understand how to address and mitigate climate adaptation risks for their residential and non-residential buildings.

Adaptation and decarbonisation policy is aligned to create whole system solutions for residential and non-residential buildings.

## Welsh Government actions

No.	We will:	Timescale for delivery
<b>In our buildings policy area:</b>		
190	Continue to work with social landlords to implement the <a href="#">Welsh Housing Quality Standard (WHQS)</a> . Section 3.7 of the standard requires social landlords to consider the <a href="#">impact of future Climate Change</a> on the proposed measures such as increased potential for overheating, increased humidity in homes and installing water butts where appropriate.	Ongoing
191	Ensure the <a href="#">Welsh Development Quality Requirements (WDQR)</a> considers overheating and humidity risk in requirements for future social homes in Wales.	Ongoing
192	Following implementation of the 2022 changes to the building regulations which introduced new requirements to mitigate the risk of overheating in new residential buildings, through the Part L 2025 review, we will explore what requirements should be extended to cover existing residential buildings (when certain building work is carried out).	Ongoing
193	Through our Climate Action Wales public engagement programme, advise the public on climate-related risks and adaptation measures for their homes (see section 3.2).	Ongoing
194	Consider how Welsh Government owned property and public sector buildings in general can be made more resilient to the impacts of climate change and design new public sector buildings in a way that meets future risks from climate change.	Ongoing
<b>In our development planning policy area:</b>		
195	Introduce new TAN 15 advice on development, flooding and coastal erosion.	2024
196	Require planning authorities to take into account Shoreline Management Plans and the latest flood and coastal information to avoid inappropriate development or increased flood risk or erosion.	Ongoing
197	Further develop mapping available via Data Map Wales to inform future partnership measures to adapt to a changing climate and encourage wider funding initiatives.	Ongoing
198	Require Property Flood Resilience measures as standard to all new builds to help prevent flood water ingress into a building or aid rapid recovery following a flood event.	2025

### **Our ask of the general public**

- › Keep your home in a good state of repair as an important first step to making it more resilient to climate change.
- › During a heatwave, shut windows and keep curtains closed during the hottest part of the day to help reduce indoor temperatures.
- › Reduce the impact of heavy rain by allowing areas of grass and plants which are much better at absorbing excess water than hard surfaces such as concrete.
- › For properties at risk of flooding, make a plan for how to deal with a flood event. That might include flood-proof doors, tiled floors downstairs and higher electrical sockets. For more information see [Natural Resources Wales Natural Resources Wales / Check your flood risk by postcode](#).
- › Consider climate change and flood risk adaptations in any home improvements or building work.
- › If you are a landlord, consider the impacts of climate change on your tenants and make changes to your property if necessary.
- › The Welsh Government has recently published factsheets on [summertime overheating in highly insulated homes](#), [summertime overheating in post 1985 properties](#) (including older buildings converted into flats), and [summertime relative humidity in older properties](#).

### **Our ask of the public sector**

- › Factor climate change and flood risk adaptations into new capital projects and expenditure.
- › Healthcare providers to support groups who may be more vulnerable to climate impacts, to ensure they can cope with the impacts of climate change.
- › All emergency services to factor in climate change impacts into future emergency plans and consider risks for people in different types of property (high rise flats, basements etc).

### **Our ask of Welsh Business and Industry**

- › Consider future-proofing buildings for climate change when designing developments and where appropriate retrofitting to improve quality and thermal efficiency.

### **Our ask of UK Government**

- › Share research and future plans for climate change and flood risk adaptations in relation to new building standards, requirements and policy setting.

## 5.11 Our Adaptation Action Plan for Towns, Cities and Rural Communities

### **Climate-related risks to towns, cities and rural communities**

Many of our towns and cities grew because of the need for strategic defence and/or as trading posts over many hundreds of years, often located on rivers, on the coast, or on floodplains. Consequently, many are now vulnerable and susceptible to the effects of climate change. Vast amounts of social and economic capital are concentrated in our towns and cities, and whilst they face a threat from climate change, they also offer opportunities for economic growth and regeneration. Many of our communities at risk from the effects of climate change are socially disadvantaged and do not necessarily have easy access to levers of power and influence to affect change. The impacts of climate change will also have an increasingly profound impact on Wales' mining legacy estate and we must ensure the safety of communities across Wales who live with this legacy.

We must seek to ensure that communities at risk are protected and that we do not exacerbate the situation by allowing new highly vulnerable development in areas at greatest risk of flooding. We also need to ensure that the design of our built environment takes into account the increasing risks of high temperatures and water scarcity.

### **Climate Adaptation Outcomes**

#### **What does good look like?**

##### **Places are prepared for and resilient to climate-related risks:**

Places protected from river, coastal, surface water and ground water flooding.

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Good long-term coastal erosion management plans in place.

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Good condition of flood management assets and infrastructure.

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Reduced risks to people and buildings from urban heat.

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Maximised use of green and blue infrastructure / Nature-based Solutions

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Effective warning systems in place.

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##### **The planning system supports and prioritises future climate resilience:**

Inappropriate new development prevented in areas of greatest risk

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New developments include flood resilience and cooling measures

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Increased provision of retrofit green infrastructure interventions.

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## Welsh Government actions

No.	We will:	Timescale for delivery
<b>In our development planning policy area:</b>		
199	Publish Technical Advice Note 15 (TAN 15) on Development, Flooding and Coastal Erosion, to ensure new highly vulnerable development is restricted in areas of greatest flood risk	2024
200	Continue to implement Planning Policy Wales (PPW), which is the overarching framework for planning development in Wales. The primary objective of PPW is to ensure that the planning system contributes towards the delivery of sustainable development and improves the social, economic, environmental and cultural well-being of Wales, as required by the Planning (Wales) Act 2015 and the WFG Act. Our approach to planning policy encourages blue and green infrastructure to be incorporated into the design of towns and cities helping to alleviate some of the impacts of climate change.	Ongoing
<b>In our disused mines and coal tips safety policy area:</b>		
201	Work in partnership with local authorities, NRW and the Coal Authority, to continue to deliver a programme of inspection, monitoring and maintenance on disused coal tips in Wales. Deliver legislative reform for disused tip safety in Wales, which will give greater security to the communities impacted by Wales' mining legacy areas. It will enshrine in legislation a long-term, sustainable and fit for purpose regulatory regime for disused tip safety, robust to the impact of climate change, and led by a newly created public body solely focused on this work.	Ongoing Bill introduction autumn 2024
<b>In our emergency preparedness policy area:</b>		
202	Work closely with Natural Resources Wales, Public Health Wales, the Met Office and other partners to ensure that effective early warning systems are in place and promoted, including in relation to extreme weather events.	Ongoing
<b>In other policy areas:</b>		
Towns, cities and rural communities are dependent on climate-resilient energy, water, drainage, transport, ICT and telecoms systems and on effective catchment scale fire, flood and coastal risk management. See sections 2.8, 2.9, 2.10, 5.6, 5.9, 5.13 and 5.14 for further details of adaptation action in relation to these areas.		



**Our ask of the general public**

- › Consider climate change as part of any home improvements.
- › Consider what steps you can take to help reduce the impact of climate change on your surroundings. For example, creating areas of shade to help reduce temperatures in summer heatwaves.
- › See advice from Natural Resources Wales on how to prepare your home and what to do during and after a potential flooding event.

**Our ask of Local Government**

- › Fully consider the impacts of climate change in all decision making, especially in planning decisions.

**Our ask of the wider public sector**

- › Consider flooding risk within new capital projects and expenditure.
- › Consider the increased risks from climate change when planning for future emergency scenarios.

**Our ask of Welsh Business and Industry**

- › Consider climate change risks within the design of all new developments.

## 5.12 Our Adaptation Action Plan for Culture and the Historic Environment

### **Climate-related risks to culture and the historic environment**

Cultural heritage is essential to enhancing our well-being and quality of life. It connects us to our past, present and future by shaping the places we live, providing meaning, shared values and a sense of place and belonging. It encompasses the arts, movable heritage (museum collections and archives), archaeological resources, buildings and structures (whether protected by heritage designation or not), cultural landscapes and associated communities, and marine heritage. It also includes intangible heritage, such as folklore, traditions, language, knowledge and practices.

Cultural heritage is a precious, irreplaceable resource that needs to be managed and sustained for the benefit of present and future generations. Whilst our understanding of the many impacts of climate change on culture and the historic environment has improved since publication of the [Historic Environment and Climate Change Sector Adaptation Plan](#) in 2020, more action is needed to increase our capacity to manage the impacts and to build resilience.

This requires cross-sector collaboration. Climate impacts affecting cultural and historic assets have knock-on effects on other related sectors including tourism, health and well-being, and the natural environment, and vice versa. It is vital these interactions are understood, and that cultural heritage is fully considered in the design and implementation of adaptation actions. Wherever possible we should seek to avoid unintended consequences that could harm the value and significance of cultural and historic assets.

There are also opportunities to use culture and the historic environment as a vehicle for effective public engagement on climate change. The arts speak to hearts and minds, inspire action and help us understand climate change through storytelling and shared experiences. The creative industries – design, music, fashion and film – shape our lifestyles, tastes and consumption patterns. Culture is a building block of inclusive, innovative and resilient communities and promotes relatable, meaningful and human-centred climate action. The preservation and conservation of cultural and historic assets demonstrates sustainable, circular and regenerative solutions.

### **Climate Adaptation Outcomes**

## **What does good look like?**

### **Cultural heritage and historic environment features are resilient to the impacts of climate change:**

Risks to cultural assets and the historic environment are understood and managed (archaeological sites, buildings, historic landscapes, shipwrecks, museums, archive and library collections, folklore, traditional language, knowledge and practices, etc)

Regulations and standards support the protection and appropriate conservation of heritage assets.

## Welsh Government actions

No.	We will:	Timescale for delivery
<b>In our historic environment policy area:</b>		
203	Cadw will lead by example by developing an organisational climate and nature strategy and action plan that embeds climate adaptation and environmental sustainability into business planning.	2024-26
204	Review Cadw guidance and provide or strengthen advice on climate adaptation where necessary	Ongoing
205	Deliver the <a href="#">Cadw Climate Adaptation Pathways Fellowship</a> , which is using Cadw sites to test adaptation approaches and develop case studies, guidance and templates to promote good practice	2024-25
206	Cadw will work with others to promote the guidance and templates for Climate Risk Assessment and Adaptation Planning for cultural and historic assets.	2024-25
207	Assess the vulnerability and exposure of sites to natural hazards, both now and in the future, in all Cadw monitoring activities of monuments and listed buildings at risk	Ongoing
208	Where possible, use Cadw grant programmes to promote and support the historic environment sector to build resilience and adapt to climate change. This applies to grants awarded to organisations as well as grants awarded in respect of specific historic assets.	Ongoing and will be developed further
209	Cadw will seek opportunities to work with others to help raise awareness and provide trusted sources of advice for owners, professional advisors and asset managers on climate change risks and adaptations to cultural and historic assets (e.g. through the <a href="#">Climate Action Wales</a> public engagement programme).	Ongoing and will be developed further
210	Cadw will support the development and implementation of the Sustainable Farming Scheme, providing training and guidance where required.	2024-25
211	Cadw will work with Welsh Government, local government and strategic partners to help ensure the significance of historic assets and their settings are understood, given due weight and fully integrated into decision-making processes, and that any risks as a result of climate change or adaptation action are managed. Cadw will provide support through training and guidance where required.	Ongoing and will be developed further
212	Cadw will work with partners to identify gaps in our knowledge and promote research to support climate adaptation policy and practice (e.g. through the UK Heritage Adaptation Partnership, a collaboration between Cadw and counterparts across the UK, aiming to address climate risks to historic sites).	Ongoing

No.	We will:	Timescale for delivery
213	Cadw will promote the knowledge and skills needed to support climate adaptation, as well as the role of repair and maintenance in building the resilience of historic assets.	Ongoing
214	Cadw will deliver environmentally sustainable management practices, including opportunities to increase biodiversity across sites within its guardianship estate. We will showcase examples to encourage others to take action.	2024-25
215	Advocate for the inclusion of content into Welsh and UK regulations and standards that support the protection and appropriate conservation and adaptation of cultural and historic assets.	Ongoing
<b>In our culture and arts policy area:</b>		
216	Review the resources and evaluation frameworks available to the museums, archives, libraries and arts sectors to enable the gathering of data to establish a baseline, develop benchmarks, plan, report and measure progress towards resilience through adaptation actions and activities.	2024 and ongoing
217	Consider the findings of the Welsh Culture Sector and Climate and Nature Emergencies report relating to climate adaptation.	
218	Gather and disseminate good practice in how culture and collections can be used to interpret and communicate the impacts of the climate crisis and the need for adaptation with the public and stakeholders.	
219	Support the culture and arts sectors to assess, build their resilience and adapt to the climate crisis. This will include the provision of advice and guidance, dissemination of good practice, skills development and training, facilitation of networks, and access to relevant programmes. Where possible, capital and revenue grant schemes will encourage applications delivering actions around climate adaption and resilience.	
<b>In our flood and coastal erosion management policy area:</b>		
220	Ensure the significance of historic assets and their settings are understood, given due weight and fully integrated into decision-making processes for flood and coastal erosion management plans and projects. Section 2.9 summarises our national policy approach to flood and coastal erosion risk management.	Ongoing
<b>In our buildings policy area:</b>		
221	Promote the use of appropriate materials and methods for traditionally constructed and historic buildings within all <a href="#">Optimised Retrofit Programme (ORP)</a> and <a href="#">Welsh Housing Quality Standards (WHQS)</a> and Welsh Government owned buildings projects.	Ongoing

No.	We will:	Timescale for delivery
<b>In our transport policy area:</b>		
222	Aim to enhance the social, environmental, cultural and historic value of landscapes and assets within transport decision making and design of climate adaptation measures, with a view to supporting actions that provide the widest financial and non-financial value, for example Nature-based Solutions	Ongoing
<b>In our energy policy area</b>		
223	Consider cultural and historic landscapes and assets in all energy supply adaptation decision-making and projects. Such considerations are part of the decision-making process through <a href="#">Planning Policy Wales</a> , <a href="#">Future Wales – The National Plan</a> and the <a href="#">Technical Advice Notes guidance</a> .	Ongoing

**Our ask of owners and managers of cultural and historic assets, their professional advisors and the general public**

- › Assess climate and nature risks and take adaptation action to build the resilience of cultural and historic assets within their care (e.g. by developing and implementing Conservation Management Plans, addressing maintenance backlogs, and undertaking appropriate climate adaptations). Use and promote Cadw's guidance to assist this work.

**Our ask of UK Government**

- › Ensure that UK policies, programmes, regulations and standards support the protection and appropriate conservation and adaptation of cultural and historic assets. This includes developing a holistic approach towards climate mitigation and adaptation. This will help ensure that necessary risk-based adaptation decisions have equal footing with carbon reduction targets, and that unintended consequences are avoided.

**Our ask of the public sector**

- › Demonstrate leadership by developing organisational climate and nature strategies and action plans that embed climate adaptation and environmental sustainability into business planning. Include policies and actions that improve understanding of climate and nature risks and that build the resilience of cultural and historic assets within their care (e.g. by ensuring staff have the necessary skills, training and resources; developing and implementing Conservation Management Plans; addressing maintenance backlogs and undertaking appropriate climate adaptations).
- › Adopt an 'Adaptation Pathways' approach for the short, medium and long-term management of cultural and historic assets within their care. Cadw is developing guidance and tools to assist the risk assessment and adaptation planning process.
- › Review planning and other guidance to raise awareness and provide or strengthen advice on climate adaptation for cultural and historic assets. Use and promote Cadw's guidance to assist this work.
- › Demonstrate local leadership by supporting, engaging and mobilising communities, partners and individuals to take adaptation action that builds the resilience of cultural and historic assets.
- › Gather and disseminate examples of good practice in the management and adaptation of cultural and historic assets. Provide case studies for Cadw to include on its website.
- › Use all available levers, such as grant programmes and partnership agreements, to encourage the owners/managers of cultural and historic assets to develop and implement Conservation Management Plans. These should contain policies and actions that improve understanding of climate and nature risks and that build the resilience of the assets within their care.

## 5.13 Our Adaptation Action Plan for Energy Supply

### Climate-related risks to energy supply

All energy-related infrastructure is at risk from the impacts of climate change. CCRA3-IA highlights risks associated with the changing frequency and intensity of surface water and coastal flooding, and the risk of disruption caused by high and low temperatures, snow and ice, high winds and lightning. Energy infrastructure assets represent a key element of the UK infrastructure system and could affect, or be affected by, failures of other assets due to extreme weather such as transport, information and communications technology (ICT) and water infrastructure including reservoirs, pipelines, water treatment plants and sewage treatment plants. There are also risks to buried infrastructure such as gas pipelines, with damage potentially becoming more frequent in future due to flooding (affecting bridges that carry pipelines) and subsidence. Hydroelectric power output can be affected by high and low river flows, which may be affected to a greater extent in future due to

expected changes in rainfall patterns. Impacts have been seen in recent years, including reduced generation in 2018 due to the very dry summer. The potential for reduced water availability in future could reduce output of thermal power generators and potentially biomass and gas power output. The risk of more frequent destabilisation or degradation of offshore infrastructure due to sea level rise and more extreme weather could also occur in future, though the CCC has recognised this is difficult to quantify.

Household heating demand is very likely to decrease due to warmer winters, and cooling demand is likely to increase in hotter summers if air conditioning uptake increases. These changes may alter the pattern of peak electricity demand for energy companies.

### Climate Adaptation Outcomes

## What does good look like?

### System-level security of supply:

Resilience plans consider generation capacity, flexibility and redundancy, generation mix, location and water needs for net zero compatible generation.

### Reduced vulnerability of energy assets to extreme weather:

Energy assets and infrastructure protected from flood, wildfires, subsidence, landslides and erosion.

Good condition and appropriate heat protection / operating thresholds for power system infrastructure.

Minimal water abstraction.

### Interdependencies are identified and managed:

Interdependency risks (e.g. transport, water, digital) included in climate risk assessments and adaptation plans for all major electricity and gas system operators

## Welsh Government actions

Energy supply is not a devolved responsibility of the Welsh Government and energy-related infrastructure is under ownership of the transmission and distribution networks operators. In terms of ensuring the security of the existing energy supply to homes, services, businesses and industry in Wales, the direct responsibilities for the resilience of supply and infrastructure fall to other parties outside Welsh Government. This plan sets out the actions Welsh Government is taking to help ensure energy resilience, while reflecting the key responsibilities of the UK Government and others.

The distribution network operators cover climate resilience within their business plans and the Welsh Government has regular engagement with the network operators as they develop their plans. The Welsh Government therefore has well established communication channels and collaborative groups which facilitate constructive working relations with these and other relevant parties, through which we monitor any issues within this area. We raise concerns and provide direction to mitigate potential negative consequences for the citizens of Wales which may arise from any issues, and we feed in matters of Welsh policy to strategic planning for these areas. We will continue to collaborate with UK Government on energy-related actions arising from the [CCC's 2023 Adapting to Climate Change Progress in Wales report](#). However Wales will prioritise its own reporting mechanisms, recognising how Wales relates to the rest of the UK.

No.	We will:	Timescale for delivery
<b>In our energy policy area:</b>		
224	Work with representatives of all sectors and regions of Wales to develop a set of principles for grid development. The principles will be developed within the framework of the WFG Act. These will include consideration of climate risks and adaptation in addition to community requirements, environmental impact, visual impact, and cost, and will be integrated into Planning Policy Wales as they are developed. Future proposals for new electricity lines will then need to meet these principles if they are to be supported by the Welsh government.	Q1 2025 for principles to be developed.
225	Ensure resilience of the energy supply is considered within our ongoing strategic planning for a net zero energy system, in light of the projected increased demand in electricity in particular, and in meeting renewable energy targets as energy generation and energy demand moves away from oil and gas towards renewable and low-carbon energy supplies.	Ongoing
226	Consider the suitability of new energy-related infrastructure developments as part of the planning consent process, whether this is devolved or falling within the UK Government Development Consent Order regime, and ensure our planning system supports energy related investment in the right place in a climate resilient way. Planning Guidance, <a href="#">Technical Advice Note 12</a> on Design includes the need for climate change adaptation as part of the design process.	Ongoing
227	Continue to monitor power outages for Wales in terms of energy resilience and link into wider energy resilience data at the GB level through joint work with the UK Government.	Ongoing
228	Consider policy options falling within Welsh Ministers devolved powers to address sector-specific risks and contingency planning in relation to power outages, in the context of the increasing risks posed by climate change	Ongoing



No.	We will:	Timescale for delivery
<b>In our flood and coastal erosion management policy area:</b>		
229	Use mapping available to help ensure infrastructure is resilient to future climate change adaptive needs.	Ongoing
230	Avoid poor developments putting supply chain at risk, by utilising TAN 15 advice regarding development on flood plains, including consideration of flood risk from all sources.	Ongoing
231	Use Shoreline Management Plans, latest flood and coastal information, and policies SOC_08 (Resilience to coastal change and flooding) and SOC_09 (Effects on coastal change and flooding) of the Welsh National Marine Plan, to ensure infrastructure is resilient to flooding and to avoid inappropriate development or increased flood risk.	Ongoing
232	Map key sites to allow future partnership measures to adapt to a changing climate and encourage wider funding initiatives.	Ongoing
<b>In our development planning policy area:</b>		
233	Continue to implement Planning Policy Wales and Future Wales – the National Plan 2040 which provide the policy basis for consenting in Wales. These documents contain policies on climate change adaptation along with <a href="#">Technical Advice Notes on Design</a> and <a href="#">Flooding</a> , providing guidance on how to protect development proposals from flood, subsidence, landslides and erosion.	Ongoing
234	Continue to implement <a href="#">TAN 12 Technical Advice Guidance on Design</a> , which includes climate adaptation, and the Design and Access Statement requirements in Wales, which were brought into legislation to ensure issues such as heat protection / operating thresholds for power system infrastructure are considered as part of design requirements.	Ongoing

**Our ask of the general public**

- › Keep essential supplies in the home in case of power failures.
- › Consider climate change adaptation as part of any home improvement and building work.

**Our ask of UK Government**

- › Involvement of the Welsh Government and Welsh stakeholders in key planning for national power outages. Work closely together on resilience planning.

**Our ask of strategic partner bodies**

- › Distribution Network Operators (DNOs) and National Grid in Wales to continue working with the Welsh Government on evidence and adaptation in the power sector.
- › DNOs and National Grid to continue publishing live information on outages and the geographical areas affected, including Wales.

**Our ask of Welsh Business and Industry**

- › Trade bodies to raise awareness of climate risks and adaptation.
- › Businesses to consider adaptation and contingency planning for climate-related risks to energy supplies.
- › Adhere to the Welsh National Marine Plan policies for any developments in the marine environment, including SOC\_11 – Resilience to Climate Change.

**Our ask of the public sector**

- › Continue to engage with local resilience fora to prepare for emergency situations arising from power failures in extreme weather.
- › Local Government to coordinate the delivery of Local Area Energy Plans and provide planning policies through the Local Development Plans to support the actions required.

## 5.14 Our Adaptation Action Plan for Telecoms and ICT

### Climate-related risks to Telecoms and ICT

The key risks to telecommunications are from the impacts on the enabling infrastructure such as subsurface, undersea and overground cables, communications masts, key buildings (e.g. telephone exchanges) and data infrastructure (e.g. data centres). These can be impacted by severe weather (e.g. storms) and both fluvial and coastal flooding.

Many modern-day services and their underlying infrastructure rely on digital connectivity to operate effectively including water, electricity and gas infrastructure. Telecommunications infrastructure is in turn reliant on other infrastructure, particularly power, to operate. This means that telecommunications infrastructure is at risk from cascading failures and also impacts other sectors as part of wider interconnected systems.

Telecommunications policy is not devolved to Wales with responsibility resting with the UK Government Department for Science, Innovation and Technology and the regulator Ofcom. The UK Government leads on all issues of telecommunications resilience including both immediate and emergency issues and longer-term planning. The UK Government has well established fora and mechanisms to engage with the telecommunications industry including through the Electronic Communications Resilience and Response (EC-RRG). Through the EC-RRG, the UK Government works closely with the telecommunications industry to disseminate best practice and policy advice to further enhance the sector's resilience. EC-RRG also manages the National Emergency Plan for Telecommunications which sets out processes for handling emergencies, priority customers and services.

### Climate Adaptation Outcomes

## What does good look like?

### System-level resilience:

Contingency planning in place for weather-related outages.

Redundancy included in system design and operation (for power supply, emergency generation, comms, cooling).

Diversity of technologies included (mobile, fibre/copper lines, fixed wireless connections, satellite).

### Telecoms and ICT assets are resilient to extreme weather:

Telecoms and ICT assets protected from flood, subsidence, landslides and erosion.

Good condition and appropriate heat protection / operating thresholds for telecoms and ICT system infrastructure.

### Interdependencies are identified and managed:

Interdependency risks (e.g. energy, transport) included in climate risk assessments and adaptation plans for all major telecoms and ICT operators.

## Welsh Government actions

No.	We will:	Timescale for delivery
<b>In our ICT and Telecoms policy area:</b>		
235	Engage with UK Government and Ofcom to ensure that Ofcom is given a climate resilience remit across the UK, including all devolved administrations.	Ongoing
236	Consider policy options falling within Welsh Ministers devolved powers to address sector-specific risks and contingency planning in relation to ICT and telecoms outages.	Ongoing
<b>In our energy policy area:</b>		
<p>Our ICT and telecoms systems are increasingly dependent upon resilient energy supplies. See <i>Our Adaptation Action Plan for Energy</i> in section 5.13</p> <p>See also section 2.9 which summarises our national strategic approach to Flood and Coastal Erosion risk management.</p>		

**Our ask of Welsh Business and Industry**

- › Report issues to their service provider
- › Plan for potential disruption to digital services due to the consequences of severe weather.

**Our ask of strategic partner bodies**

- › Ensure that climate risks to telecommunication and data infrastructure are adequately identified and work through the Electronic Communications Resilience and Response Group (EC-RRG) and other mechanisms to ensure that the sector is aware of the climate risks and takes the necessary mitigating action.

**Our ask of the public sector**

- › Report issues to their service provider
- › Escalate issues via the UK Government
- › Plan for potential disruption to digital services due to the consequences of severe weather.

**Our ask of UK Government**

- › Involve the Welsh Government in key resilience planning to discuss how telecoms recovery is prioritised in the event of power outages to avoid cascading impacts.
- › Ensure that climate risks to telecommunication and data infrastructure are adequately identified and work through the EC-RRG and other mechanisms to ensure the sector is aware of climate risks and takes the necessary actions to adapt. Establish and maintain clear lines of communication on telecoms resilience issues with:
  - Welsh Government
  - Local Resilience Forums in Wales
  - Welsh Public Sector organisations
  - Welsh Businesses
  - Citizens of Wales.

**Our ask of the general public**

- › Report any issues to your service provider.

## 5.15 Our Adaptation Action Plan for Finance

### Context

To underpin the actions and ambition set out in this national adaptation strategy, fundamental enablers including finance, guidance and support will be required.

The costs of developing a nation robust to the effects of climate change are likely to be substantial, but the cost of inaction are projected to be substantially greater. Early evidence suggests that by 2100, damage costs associated with high levels of global warming in Wales will be significant. However, assuming widespread mitigation policy to curb global emissions alongside appropriate investment in climate change adaptation (such as improved flood defences), these climate change damage costs will be substantially lower.

Work is ongoing to develop our understanding of the costs associated with climate impacts and adaptation, where they might fall, and the distributional impacts. We recognise that in considering the benefits of intervention we must be mindful of the risk that the associated costs could fall disproportionately on particular groups, impacting the associated wider benefits of intervention. Given the value-for-money imperative to act, we also need to work collaboratively with local and regional governments, the private sector, UK Government and broader stakeholders to explore the relative burden share of action, and for Welsh Government to show leadership and tackle gaps that others are unable to support. Leveraging finance from a variety of actors, driving a broad cross-section of benefits for Wales, will be important in tackling the climate crisis.

While the Welsh Government recognises and is committed to tackling the climate emergency, it also must operate within strict budget rules, with only limited tax and borrowing powers with which to affect the overall size of its budget alongside the constrained fiscal context requiring tough choices over what action can be prioritised and afforded. In particular, the capital context has and is projected to remain particularly challenging, impacting the ability to invest in infrastructure that can support climate adaptation. As a consequence, we must target resources at those projects and interventions which provide the highest net returns to society within affordability limits, ensuring that ideally interventions can also leverage delivery of wider benefits. The manifestation of these principles and priorities will be demonstrated in the expected spending review work, to be carried out during the lifetime of this strategy.

The freedom of manoeuvre for the Welsh Government is limited by our reliance on the settlement we receive as a result of the UK Government budget and spend decisions which directly inform the funding available to Wales. Financial mechanisms, regulation, products and models are also largely out of the hands of the Welsh Government, which mean that the actions available are limited. Despite these important restrictions, the Welsh Government is committed to work, where it can, to promote the climate outcomes set out below through the approach detailed in this plan.

### Climate Adaptation Outcomes

## What does good look like?

### Financial institutions incorporate physical risks into financial decision-making:

Physical risk losses and impairment rates for lending to corporates, mortgages and consumer credit.

Reduced losses on investment assets and liabilities from physical risks and weather-related claims.

Reduced climate-related risks to pension assets.

### Viable climate adaptation projects proceed where the case for funding is made:

Funding (public, private, or otherwise) is considered balanced against wider priorities for all adaptation projects where the benefits exceed the costs, including the use of innovative finance models.

Maximised use of adaptation-linked financial models and products.

Equitable credit and insurance coverage and premiums for corporates and households to address climate-related risk.

No.	We will:	Timescale for delivery
<b>Spending on adaptation:</b>		
237	<p>The next Spending Review of the UK Government will provide the Welsh Government with an opportunity to allocate funds in line with its commitment to tackling the climate emergency. However, this will be extremely dependent on the overall settlement and tough decisions to balance funding proposals across a range of priorities may need to be taken. As ever, this Government will seek to maximise the benefits from every pound of investment, but the uncertainty means the actions set out within this plan will be subject to decisions made later this year, or early next as part of that spending review process. The Welsh Government will look to include, wherever possible, the net additional costs (where they exist) of embedding climate resilient solutions in Welsh Government investments, and consider bespoke items that tackle climate related risks carefully, on a case by case basis, informed by the latest evidence available.</p>	Ongoing
238	<p>An assessment of the value for money for all projects or policies used to address adaptation is important to ensure that the benefits exceed the costs. The Welsh Government will, within its funding envelope, look to prioritise funding for projects which are able to provide evidence that the likely benefits exceed the costs to society over time balanced against funding wider priorities.</p>	Ongoing
<b>Consideration of multi-annual budget cycles:</b>		
239	<p>It remains the Welsh Government's aspiration to provide longer-term budgets for our partners and stakeholders. The opportunity, in 2021, to provide a multi-year settlement up to 2025 and offer certainty to the organisations that Welsh Government fund over three years was implemented. However, 2024-25 is the final year of this spending review period. A budget for 2025-26 is expected to be provided alongside the UK Government's Autumn Budget, with settlements for 2026-27 and 2027-28 expected to be provided in Spring 2025. Thereafter, the UK Government has announced that its Spending Reviews will now occur every two years, providing at least three years of future budgets. As this is a recent change, the Welsh Government will work through what the implications are for its future budget setting process.</p> <p>We are keen to continue exploring how to provide more security and certainty of grant funding over a longer duration, particularly for grant recipients in the third sector, and to lessen rigidity in grant processes. Collaborative work is already underway which will ultimately bring about lasting and longer-term benefits to Wales.</p> <p>Looking further ahead, the Welsh Government is committed to fiscal planning that extends beyond any multi-year settlement periods and which focuses on the medium to longer-term challenges and opportunities that we will face in Wales but with the ability to adapt and react to changing circumstances over time. This is particularly pertinent in relation to climate and nature, where a longer term, strategic approach is valuable</p>	Ongoing

No.	We will:	Timescale for delivery
<b>Exploration of future finance models for climate adaptation:</b>		
240	We recognise the scale of action needed may be difficult to deliver purely through existing public funding routes. We will therefore gather evidence and investigate potential future finance models for adaptation. We will also seek to work with other governments within the UK to develop options where appropriate	Ongoing
<b>The Social Partnership and Public Procurement (Wales) Act 2023 (SPPP):</b>		
241	The SPPP Act includes clauses that will require the consideration of climate change resilience in the design, construction and operation of major construction projects, including an assessment of risks and opportunities arising from climate change.	Ongoing
<b>Integrated Impact Assessments:</b>		
242	An assessment of the climate change resilience of all new Welsh Government policies and programmes will be included as part of our integrated impact assessment process. This means that all new policies and programmes will need to consider climate change adaptation issues in their design and delivery, including as part of bidding for funding.	Ongoing
<b>Analysis of the costs and benefits of climate adaptation measures:</b>		
243	We will work with the Climate Change Committee and other partners to develop the evidence base for future investment in adaptation measures. We will consider commissioning further analysis of the economic case for investment in climate change adaptation in Wales.	Ongoing