Climate Change Adaptation Route Map for Oxfordshire 2025-2030

Enhancing resilience for all Oxfordshire communities and businesses to the impacts of climate change, prioritising the most vulnerable

Author:
Sustainability West Midlands

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sustainability west midlands

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Report information

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Project Manager and Report Author: Alan Carr (SWM)

Project Contributors: Anna Bright (SWM), Morgan Roberts (SWM), Kit England, Paul Watkiss (Paul Watkiss Associates), members of the Future Oxfordshire Partnership and numerous stakeholders and consultees who contributed to the development of the Route Map.

Quality assured by: Anna Bright (SWM)

Disclaimer: This report represents the independent advice commissioned from Sustainability West Midlands and partners and not necessarily that of the funders.

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About Sustainability West Midlands

Sustainability West Midlands (SWM) was established in 2002 as an independent, not-for-profit company and our purpose is to help the West Midlands become more sustainable, greener and fairer for all.

Our vision is that the West Midlands is leading in contributing to the national target of Net Zero greenhouse gas emissions by 2050 whilst addressing health inequality and driving inclusive growth. We monitor the West Midlands Sustainability 2030 Roadmap which acts as a framework that all organisations based or operating in the region can use to help them make changes to their activities in the knowledge that they will contribute to wider regional ambition.

SWM supports our members and other local stakeholders in the public, private and third sectors to implement these changes by enabling them to demonstrate innovation and leadership and provide opportunities to collaborate and celebrate success.

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Contents

Above: Harcourt Arboretum, Nuneham Courtenay
Front cover image: Flooding on Abingdon Road, Oxford

Foreword

As one of the most successful counties in the UK, Oxfordshire has an enormous array of strengths and assets across a diverse variety of areas – from its academic and research excellence to its world-renowned natural environment, historic towns, innovative business and community groups. Oxfordshire's economy is thriving and its innovation is the envy of much of the world.

However, this success is threatened by the impacts of climate change. In recent years, we have witnessed an increasing number of extreme weather events around the world. From the extreme drought in Chennai in 2019 and record-breaking Canada Heat Dome in 2021, to flash flooding in Germany in 2024, to the raging wildfires in Los Angeles. The scale of these events would be unimaginable without climate change.

Oxfordshire is not immune to the impacts of climate change – the increasingly frequent flood events, the record 38°C heatwave in 2022 and the extreme levels of rainfall in 2024 are already impacting the county. Without action, the impacts of these events will only get worse – the health and wellbeing of our residents and communities will suffer from increasingly severe heatwaves, the size of the local economy will shrink considerably and our biodiversity and natural habitats will be increasingly threatened.

The good news is that we have the power to act and adapt to a changing climate to ensure Oxfordshire continues to thrive. By taking long-term, proactive measures and investing in approaches that will bring numerous co-benefits to residents, business and the natural environment, Oxfordshire has an enormous opportunity to futureproof itself from the increasingly severe and frequent weather events we can expect in the future.

This Climate Adaptation Route Map has been co-developed by local stakeholders, including councils, business, the universities, the NHS and community groups, to enable Oxfordshire to take collective action and build long-term resilience to a changing climate.

The Route Map sets out ambitious plans on what needs to be done at a local level in Oxfordshire, both our initial priorities as well as long-term actions into the future, prioritising nature-based solutions to realise the co-benefits for the natural environment, residents and communities. These proposals will necessitate innovative and collaborative thinking against a backdrop of ever tighter funding constraints and competing priorities. The hard work to implement this Route Map, in full, starts now!

Cllr Liz Leffman, Chair of the Future Oxfordshire Partnership and Leader of Oxfordshire County Council

1 Introduction

SWM has been commissioned and funded by the Future Oxfordshire Partnership (FOP) to develop a Climate Change Adaptation Route Map, aimed at providing a series of actions that will need to be implemented by decision makers in Oxfordshire to ensure that the county's natural environment, people, infrastructure, buildings and businesses are prepared for the impacts of climate change.

The Route Map is to be delivered by a wide range of Oxfordshire stakeholders (see Annex 2 for a full list of those with whom engagement has taken place) and identifies a set of actions that will need to be implemented collectively and in partnership. It is also in place to maximise the influence of local stakeholders on central Government and provides a call to action on what is required by them by way of support.

The total set of actions is split into priority actions that should be delivered in the financial year 2025/26 and, with the remaining long-term actions included in an implementation blueprint in Annex 1. In all cases, it should be noted that:

- Many of the actions are currently unfunded, with resourcing yet to be identified.
- The initial focus is on the 2025/26 actions, with the actions included in Annex 1 being opportunities to implement only when circumstances allow.
- Implementation of most of the actions will only take place when resources and/or funding has been secured and agreed by relevant stakeholders.
- Stakeholders have not yet committed to deliver many of the actions so far, but they will look to incorporate if and when an opportunity arises (or when resources are found).
- Stakeholders identified as being key to implementing the actions may only play a supporting, coordinating or consulting role in delivering the action, and not necessarily lead its implementation.
- Actions are currently high-level and subject to change as understanding and circumstances evolve.

The Route Map builds on the wider aims of Oxfordshire's adaptation programme, developed with stakeholders as part of the Climate Vulnerability Assessment in 2023, which are as follows:

- Protect the health and wellbeing of Oxfordshire residents, enabling them to build long term resilience to a changing climate.
- Improve the resilience of council services and key stakeholder operations across Oxfordshire to a changing climate.
- Minimise financial cost to the county/district councils and Oxfordshire stakeholders from future adverse and extreme weather events.
- Realise added benefit from Oxfordshire's natural environment improvement programmes and support its improved resilience to a changing climate.

The core objective is to ensure that Oxfordshire can better manage, prepare for and respond to severe weather events and an increasing likelihood and severity of these in future.

Flooded towpath at Iffley Lock

2 Purpose and background

2.1 Purpose of this document

This document sets out the climate change adaptation priorities for the county to ensure that Oxfordshire's natural environment, people, infrastructure, buildings and businesses are prepared for the impacts of climate change, including greater frequency and severity of flooding, a higher likelihood of water scarcity and more intense and prolonged heatwaves. Adaptation is needed given that analysis undertaken alongside the development of this Route Map shows that the impact of climate change could reduce Oxfordshire's GDP by up to 3.4% by 2050 and 6.5% by 2080 if no action is taken.

Flooded field near Witney, January 2024

The primary audience for this adaptation plan are the organisations who can collaborate to implement and accelerate appropriate adaptation action in the county, including national Government departments and arm's length bodies, local councils, other local organisations such as the NHS and universities, and communities.

Many of the actions included within the Plan will be implemented over the long-term and will require regular scrutiny. This Plan will therefore be continuously updated via a rigorous monitoring system, with a full refresh conducted in 2030, so that decision-making can be done in advance and as accurately as possible, in light of continuously changing circumstances. Much is likely to have changed by 2030 and this is a reasonable timescale by which to conduct a full Plan review.

The document provides:

- A summary of likely climate impacts in Oxfordshire, based on the Oxfordshire Climate Vulnerability Assessment.
- A list of climate risks, drawing on the England assessment of the Independent Assessment of UK Climate Risk and extracting those risks relevant to Oxfordshire.
- A Climate Change Adaptation implementation blueprint that sets out a series of responses to the above risks and associated impacts, and a Route Map for implementation.
- Recommended next steps and initial quick wins, and suggestions for monitoring and evaluation processes.

This document is not intended as a detailed, technical assessment of potential adaptation options and instead provides a framework to further shape key areas of intervention. For example, where there is reference to actions such as 'identify and appraise climate adaptation options for buildings,' it is only through such an assessment that detailed information would be provided on the buildings are most at risk, the reasons why (building type, who uses it etc.), and what the most appropriate actions are to address these risks (building modifications to improve ventilation, green infrastructure for more shading for example) against a range of future climatic scenarios. This Plan aims to trigger more detailed assessments where required, which would be commissioned and funded by national and local decision makers.

2.2 Background and context

Adaptation versus mitigation

This Route Map should be considered alongside others that organisations in Oxfordshire have published which convey targets and strategies to meet their relevant environmental goals. This includes a Net Zero Route Map that focus on specific sustainability thematic areas such as waste and transport, and the Oxfordshire Climate Vulnerability Assessment.

To date, many of the climate-focused plans and strategies produced for Oxfordshire have focused on climate change mitigation, i.e. how actions can reduce greenhouse gas emissions. By contrast, this Plan focuses on accepting that we are already locked-in to a significant level of climatic change as a result of historical greenhouse gas emissions, and that we therefore need to deal with the increasing severe weather events that will occur as a consequence. This is known as climate adaptation. The defined differences between mitigation and adaptation are as follows:

- **Climate change mitigation** means avoiding and reducing emissions of heat-trapping greenhouse gases (e.g. carbon dioxide) into the atmosphere to prevent the planet from warming to more extreme temperatures.

- **Climate change adaptation** means altering our behaviour, systems, and, in some cases, ways of life to protect our families, our economies, and the environment in which we live from the impacts of climate change. Adaptation to climate change can be considered as being proactive rather than reactive wherever possible.

This Route Map focuses on climate change adaptation, although it should be borne in mind throughout this document that some of the adaptation focussed actions could support the county's target to meet its Net Zero emissions target by 2050. Similarly, some mitigation focused actions included in other plans will also offer opportunities for adaptation. The key message is that Oxfordshire **needs to do both** in order to strengthen its overall climate resilience and, wherever possible, identify ways that it can deliver projects that both reduce greenhouse gas emissions and adapt to climate impacts concurrently, such as nature-based projects.

Adaptation national context

The Climate Change Committee (CCC) is the Government's statutory adviser on preparing for climate change. Under the Climate Change Act (2008) the CCC, through its Adaptation Committee and secretariat, has two main roles in relation to climate change adaptation:

- To provide independent, expert advice on the UK Climate Change Risk Assessment (CCRA).

- To report to Parliament on progress with implementation of the Government's National Adaptation Programme (NAP).

In June 2021, the CCC launched its latest Independent Assessment of UK Climate Risk for Government to form the basis of the third CCRA. Over 450 people from more than 130 organisations contributed evidence to the report, which was then used to assess the risks to the UK from climate change and the magnitude and urgency of these risks (research for its next assessment due to be published in 2026 has (as of Summer 2024) now commenced).

This assessment was then used to develop the next UK CCRA, published by Defra in January 2022, and the third National Adaptation Programme (NAP3) published in July 2023 , within which are numerous actions that are intended to accelerate adaptation action in the UK, alongside recommendations for local authorities on what they can do to adapt.

Alongside this, adaptation forms a key part of the Government's Environmental Improvement Plan published in January 2023. This should be referred to alongside globally-focused agreements at recent United Nations Climate Change Conferences (COP) events, such as the measures to halt and reverse nature loss, including putting 30% of the planet and 30% of degraded ecosystems under protection by 2030 which was agreed at COP15. Without climate change adaptation, such targets cannot realistically be met as the expected climate impacts of more extreme weather and associated consequences (flooding, heatwaves, wildfires, drought) will undermine them.

Flooding at Ladygrove Estate, Didcot

Defra asks certain authorities to respond to the Adaptation Reporting Power (ARP), a mechanism to produce reports on what these authorities are doing to adapt to climate change. This largely covers infrastructure providers operating on a national level. However, at the time of publication there remains an absence of local reporting requirements, targets and resourcing to assist local authorities and their partners to adequately adapt to climate change. That is why this Route Map is required, so that key actors in Oxfordshire can begin to prioritise and simplify how actions to adapt to climate change can be embedded into other activities, e.g. nature enhancement projects. Annex 3 provides a summary of the adaptation plans of key national providers.

Work that has already been done in Oxfordshire

Oxfordshire has already commenced work on climate adaptation and the table below summarises the good practice activity already undertaken, and there are also a range of plans and strategies, some of which are mandatory, where adaptation has (at least partially) been integrated.

Nature of activity	Activity title	Details
Evidence base	Climate Vulnerability Assessment and Extreme Value Analysis	AtkinsRealis were commissioned by Oxfordshire CC to produce a Climate Change Risk Assessment, a Climate Vulnerability Assessment and an Extreme Value Analysis (see section 2).
Evidence base	Local Flood Risk Management Strategy	In their role as Lead Local Flood Authority, Oxfordshire CC has produced a Flood Risk Management Strategy in partnership with the district councils. The Strategy sets a long term programme for the reduction of flood risk and priorities for implementing measures to reduce this risk. The next iteration has recently (as of August 2024) completed a round of consultation.
Evidence base	Director of Public Health Climate Change report	The latest Oxfordshire Director of Public Health Climate Change Report highlights the health impacts of climate change and the positive benefits of climate action for individuals, families and communities. It is framed around the aforementioned Climate Vulnerability Assessment.
Evidence base	Natural Capital in Oxfordshire short report	The Environmental Change Institute at the University of Oxford have produced a report that looks at the natural capital potential in Oxfordshire and maps this accordingly. The benefits of enhancing natural capital in relation to helping tackle climate change has also been addressed.
Governance and Policy	Embedding climate impact assessments into processes	All Oxfordshire CC Services have been asked to use **climate impact assessments** in decision making (see Climate Action Programme Update document 23 April 2024).
Networks and influence	Local Climate Adaptation Guide	Oxfordshire CC worked with Exeter University and partners to develop a **climate adaptation skills and knowledge resource**, aimed at engaging and supporting local decision makers to develop their capability on climate adaptation and resilience.
Governance and Policy	Oxford to Cambridge Arc Integrated Water Management Policy and Planning Project	The three-year Integrated Water Management Framework (IWMF) programme will explore how to draw together current and ongoing water, flood, natural capital, and land use planning work to **create a shared understanding of issues and pressures** and fully interconnected water and flood risk evidence base, and test and trial new approaches across the range of water functions. It is hosted by the Environment Agency's Oxford to Cambridge Team, working with stakeholders across the water sector and Oxford to Cambridge geography. An initial review has taken place (phase 1) and it is proposed to progress phase 2 as a programme of projects to reduce the complexity of addressing these issues, maximising potential of planning policy, rethinking water planning, and developing an interactive decision-making toolkit that will help organisations understand how to integrate water in their work.

Nature of activity	Activity title	Details
Nature Based Solutions Feasibility Study	Bernwood Otmoor Ray (BOR) Landscape Nature Based Solutions (NBS) Feasibility Study	Berkshire, Buckinghamshire and Oxfordshire Wildlife Trust have led on a feasibility study to draw out the most **immediate opportunities for nature and people** in the BOR landscape, with funding from Buckinghamshire Council. The Oxfordshire Local Nature Partnership are supporting this by **investigating new funding mechanisms and income streams** based upon the ecosystem services that this region can provide for people, communities and the environment.
Natural Flood Management	Evenlode Catchment Natural Flood Management (NFM) Projects	Multiple Flood Management Schemes have been implemented in areas such as Bledington and Bruern, as part of a five-year project (2016-2021) aiming to reduce flood risk and enhance the river environment. The Environment Agency collaborated with Wild Oxfordshire, the Evenlode Catchment Partnership (ECP), Bruern Estate and the local community to deliver **agricultural land management changes and NFM measures**, including constructing 15 field corner bunds (which temporarily store 30,000m^3 of flood water), 27 leaky woody dams, and de-culverting 100m of watercourse. The NFM project was selected as the **winner of the Climate Resilient Places** category in the Flood & Coast Excellence Awards 2021.
Natural Flood Management	Freshwater network - Wetland and freshwater habitat restoration	From the Freshwater Habitats Trust website Feb 2023: "More threatened freshwater and wetland habitats will be restored, thanks to an **£811,000 Government grant** awarded to Freshwater Habitats Trust. The funding will support the national wildlife conservation charity and partner organisations to build the Freshwater Network, a national network of **wilder, wetter, cleaner and connected freshwaters**."
Capacity building	Developing capacity to develop adaptation action plans for schools	Oxfordshire CC are working on **building in-house capability** to provide site-surveys and develop bespoke climate adaptation action plans for their own schools, identifying a range of passive, behavioural and operational measures for schools to take to reduce flooding and overheating.
Planning for heatwaves	Heat Health Action Plan	Through working with Public Health, a Heat Health Action Plan has been developed to **support vulnerable residents during possible heatwave events** over the summer, including to identify near-term improvements to provision of advice and guidance to residents and increase the uptake on Community Resilience Plans with added emphasis on heatwave planning.

Developing this Route Map

This Route Map has been co-developed by Oxfordshire's stakeholders through an extensive stakeholder engagement programme (see Annex 2), which included training and co-creation workshops, interviews and surveys. Other previously produced pieces of work have also been consulted in order to inform the Route Map, especially the risk assessment and implementation blueprint elements, including:

- The Independent Assessment of UK Climate Risk (CCRA3) (2021)

- The Oxfordshire Climate Vulnerability Assessment (see section 2) (2023)
- The West Midlands Climate Change Adaptation Plan (2021)
- Other local area, place-based adaptation planning conducted by SWM and others in recent years

3 The evidence base for action

3.1 Economic assessment

Alongside the development of this Route Map, Paul Watkiss Associates (PWA) has undertaken a high-level assessment of the potential economic costs of climate change to Oxfordshire. This has included looking at the potential impact climate change could have on the county's GDP, and providing an economic rationale for implementing the very high priority actions included in this Route Map. The full analysis is available in a separate report upon request.

Indicative results show that, when compared to a 2015 baseline, and if no adaptation is taken, climate change could reduce Oxfordshire's GDP by:

- **0.5% to 0.8% by 2030**
- **2.3% to 3.4% by 2050**
- **3.7% to 6.5% by 2070**

These and other potential scenarios are represented in Figure 1 below, which shows how a range of potential global emissions trajectories may impact Oxfordshire's GDP. In short, the greater the global emissions reductions, the less impact there is likely to be on GDP in Oxfordshire. However, even with rapid emissions reductions, GDP is still likely to be reduced if no adaptation takes place.

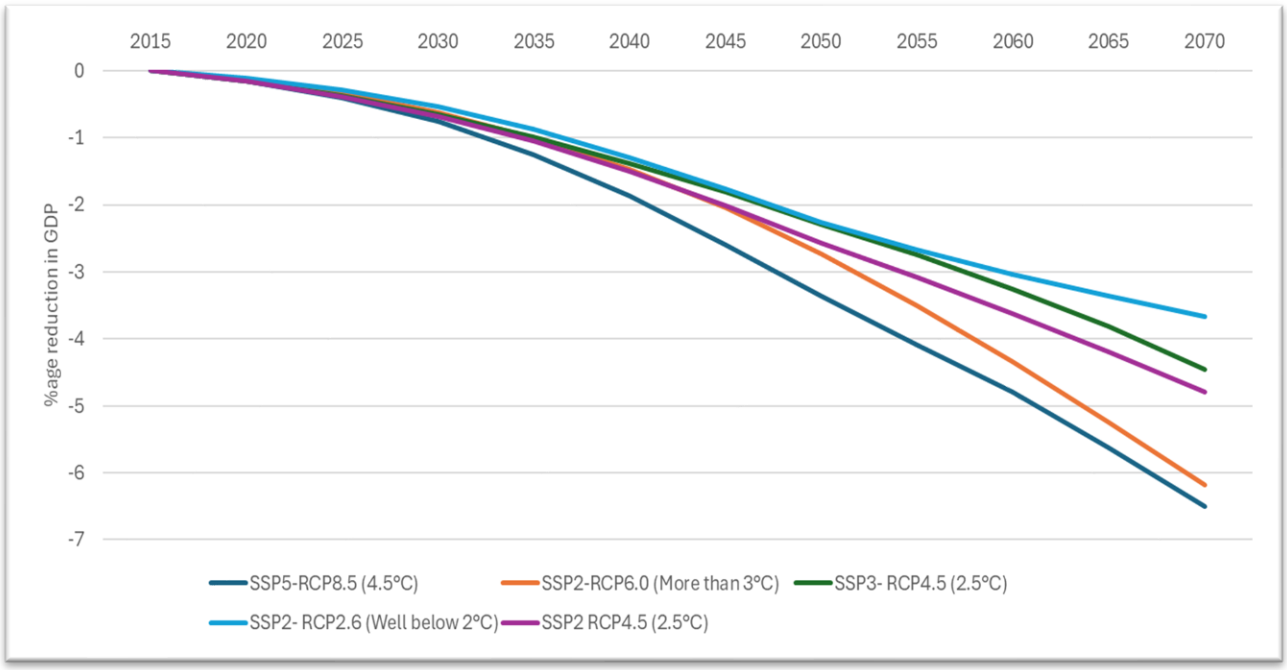


Figure 1: Potential GDP Contraction in Oxfordshire from Climate Change

It should be noted that, due to numerous uncertainties with regards to exactly how the climate will change in Oxfordshire, GDP may reduce by an even greater extent in reality, especially if more unprecedented extreme weather events occur than are currently anticipated.

Either way, the figures make a compelling case for action, as they show that climate change will have a negative impact on local economic performance. As such, adapting to projected climatic change is

fundamental to building Oxfordshire's economic resilience and limiting the likely negative impacts described above.

This is one of the main drivers for this Route Map and the actions that are included within it. Section 4 outlines the immediate actions (up to 31 March 2026) that stakeholders in Oxfordshire should take to commence the process of adapting to climate change now, with Annex 1 providing the full suite of actions.

PWA have also undertaken an economic appraisal of these actions that summarises the economic benefit of their implementation. Their analysis finds that **there is a strong economic case for investing in early adaptation actions in Oxfordshire**, given the future climate change impacts that are projected for the county, and because the benefits of such actions are likely to outweigh the costs. It also finds that the 'very high priority' actions included in section 4 and Annex 1 have a **clear economic case and rationale**.

3.2 Summary of the Oxfordshire Climate Vulnerability Assessment

See: Oxfordshire Climate Vulnerability Assessment for full details

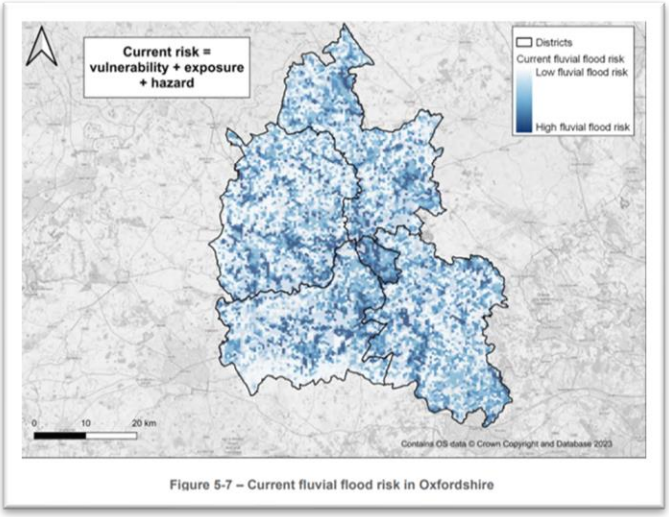


Figure 5-7 – Current fluvial flood risk in Oxfordshire

This report, commissioned by Oxfordshire CC, and produced by AtkinsRealis, looks at current and future risks posed by climate-related hazards with regards to the four key thematic areas used in the CCRA and that will be used in this Route Map: 1) critical infrastructure, 2) health, communities and the built environment, 3) natural environment and assets and 4) business and industry. The report includes:

- A summary of climate-related events since 2000, current climate-related hazards, and their impacts nationally and for Oxfordshire.
- A future risk assessment looking at future climate change scenarios projected in 2050.
- A health impact assessment to help identify the impact of climate on health and wellbeing, focusing on communities and infrastructure that are particularly vulnerable or exposed to climate hazards and Oxfordshire's current capacity to manage risks.
- Mapping of flood and heatwave risks, as well as a synthesis of available evidence related to other risks.

Actions included later in this document have been partially derived from the key findings of the Vulnerability Assessment and have also been used to produce the climate change risk assessment overleaf. It is upon these assessments that relevant actions must be developed to ensure that the county is adequately addressing the aspects that need most attention.

Key findings from the Vulnerability Assessment include:

- Heatwaves are becoming more frequent in the county, although the overall impacts of extreme heat are less well understood than the impacts from floods.
- Flooding has occurred frequently and presented the most significant climate risk in recent years.

- Drought, high winds, storms and low temperatures are still important climate-hazards, posing risks to all four themes.
- Compound risks, where multiple climate hazards and other factors combine to cause an impact, are becoming more prevalent.
- Current climate risks are not evenly spread across the county, with higher risks to vulnerable populations and future climate risks likely to exacerbate existing inequalities. The wards at highest risk are located in specific areas of Abingdon, Witney and Oxford City.
- For health impacts, vulnerable characteristics include the elderly, children and people who work outside. The potential impacts are on mental health, mortality, morbidity and healthcare services buildings and operations.

3.3 Oxfordshire Climate Change Risk and Opportunity Assessment

Introduction and summary of methodology

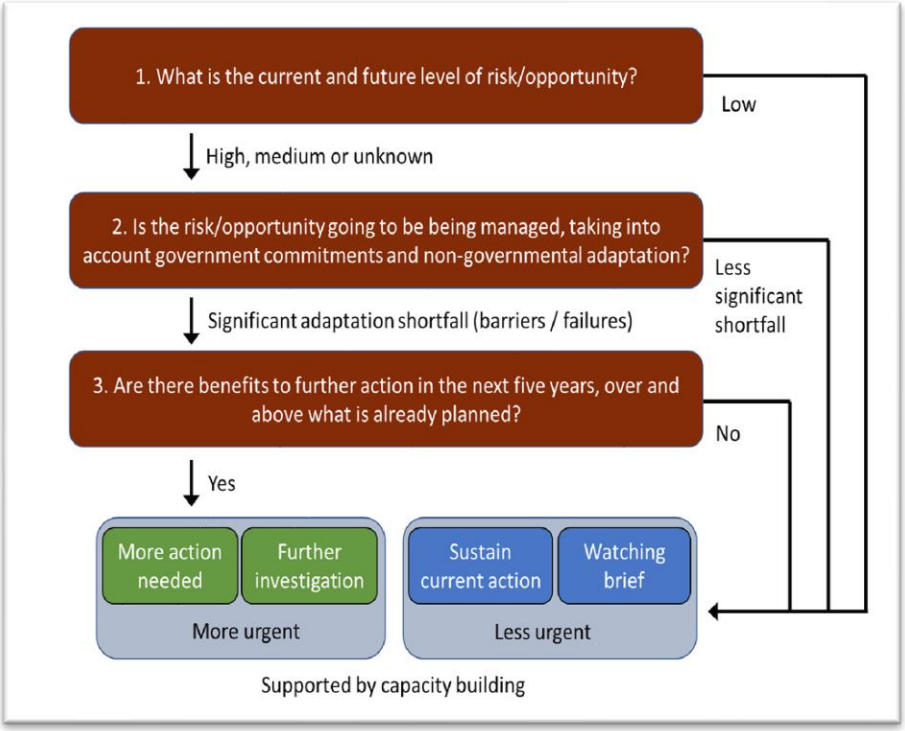
This section summarises the risks and opportunities that climate change presents in Oxfordshire. The list of risks and opportunities, complied by Paul Watkiss Associates, takes into account a combination of the Climate Vulnerability Assessment (CVA) detailed in the previous section, and the Third Climate Change Risk Assessment for England formulated by the CCC as part of their Independent Assessment (published in 2021) in informing the latest UK Climate Change Risk Assessment (CCRA3, published in 2022). It does not take into account any work that has been undertaken since 2022 that may affect the risk scores assigned in CCRA3; the next CCRA independent assessment will be completed in 2026 and will reflect this.

The CCRA3 method prioritises risks and opportunities into differing levels of urgency, based on three key questions:

1. What is the current and future level of risk/opportunity?

2. Is the risk/opportunity going to be being managed, considering Government commitments and other non-Government adaptation?

3. Are there benefits to further action in the next five years, over and above what is already planned?



The overall flow chart showing this is outlined above (as given by the CCC).

The four categories of urgency are as follows (as given by the CCC):

Category	Description
More action needed	New, stronger or different Government action, whether policies, implementation activities or enabling environment for adaptation, over and above those already planned, are beneficial in the next five years to reduce climate risks or take advantage of opportunities. This will include different responses according to the nature of the risks and the type of adaptation: • Addressing current and near-term risks or opportunities with low and no-regret options (implementing activities or building capacity). • Integrating climate change in near-term decisions with a long lifetime or lock-in. • Early adaptation for decisions with long lead-times or where early planning is needed as part of adaptive management.
Further investigation	On the basis of available information, it is not known if more action is needed or not. More evidence is urgently needed to fill significant gaps or reduce the uncertainty in the current level of understanding in order to assess the need for additional action.
Sustain current action	Current or planned levels of activity are appropriate, but continued implementation of these policies or plans is needed to ensure that the risk or opportunity continues to be managed in the future.
Watching brief	The evidence in these areas should be kept under review, with continuous monitoring of risk levels and adaptation activity (or the potential for opportunities and adaptation) so that further action can be taken if necessary.

More details about the methodology that was used to produce the England assessment and the urgency scores can be found on the UK Climate Risk website. We have also provided the methodology that was used to compile the risk and opportunity assessment, and the limitations thereof, in the Annex 2.

Risk and opportunity assessment

This high-level analysis suggests that Oxfordshire's own climate risks (and importantly, the urgency to address them within the next five years) are not substantially different from those identified at the national level for CCRA3 (presented below) and should serve as the basis to inform this Route Map. However, the analysis highlights a number of areas where stakeholder judgement indicates that, whilst the scores themselves may not be different, the adaptation efforts may warrant greater attention. These were notably in three areas:

- Building adaptive capacity in Flood Risk Management (noting the concerns raised in accessing Flood Risk Management funding to deliver schemes).
- Water availability, noting that many issues in the Water Resources Management Plan to manage drought were completely or partially outside the remit of Thames Water and subject to various stakeholder views and perspectives.
- Overheating in healthcare and council estates. There were examples cited of this already being a problem, for example a library constructed in 2016 which regularly reached 45 degrees Centigrade.

Theme: Natural Environment and Assets			
Risk or Opportunity	**Risk number and Receptor**	**Nature of risk/opportunity**	**Revised urgency score**
RISKS	N1. Terrestrial species and habitats	Changing climatic conditions and extreme events, including temperature change, water scarcity, wildfire, flooding, wind, and altered hydrology	**More action needed**

		(including water scarcity, flooding and saline intrusion)	
RISKS	N2. Terrestrial species and habitats	Pests, pathogens and invasive species	**More action needed**
RISKS	N4. Soils	Changing climatic conditions, including seasonal aridity and wetness	**More action needed**
RISKS	N7. Agriculture	Pests, pathogens and invasive species	**More action needed**
RISKS	N8. Forestry	Pests, pathogens and invasive species	**More action needed**
RISKS	N11. Freshwater species and habitats	Changing climatic conditions and extreme events, including higher water temperatures, flooding, water scarcity and phenological shifts	**More action needed**
RISKS	N12. Freshwater species and habitats	Pests, pathogens and invasive species	**More action needed**
RISKS & OPPORTUNITIES	N5. Natural carbon stores, carbon sequestration and GHG emissions	Changing climatic conditions, including temperature change and water scarcity	**More action needed**
RISKS & OPPORTUNITIES	N6. Agricultural and forestry productivity	Extreme events and changing climatic conditions (including temperature change, water scarcity, wildfire, flooding, coastal erosion, wind)	**More action needed**
RISKS & OPPORTUNITIES	N18. Landscape character	Climate change	**Further investigation**
OPPORTUNITIES	N3. Terrestrial species and habitats	New species colonisations	**Further investigation**
OPPORTUNITIES	N9. Agricultural and forestry productivity	New/alternative species becoming suitable	**Further investigation**
OPPORTUNITIES	N13. Freshwater species and habitats	New species colonisations	**Sustain current action**
Theme: Infrastructure			
Risk or Opportunity	**Risk number and Receptor**	**Nature of risk/opportunity**	**Revised urgency score**
RISKS	I1. Infrastructure networks (water, energy, transport, ICT)	Cascading failures	**More action needed**
RISKS	I2. Infrastructure services	River, surface water and groundwater flooding	**More action needed**
RISKS	I4. Bridges and pipelines	Flooding and erosion	**Further investigation**
RISKS	I5. Transport networks	Slope and embankment failure	**More action needed**
RISKS	I6. Hydroelectric generation	Low or high river flows	**Further investigation**
RISKS	I7. Subterranean and surface infrastructure	Subsidence	**Further investigation**
RISKS	I8. Public water supplies	Reduced water availability	**More action needed**
RISKS	I9. Energy generation	Reduced water availability	**Watching brief**
RISKS	I10. Energy	High and low temperatures, high winds, lightning	**Further investigation**

RISKS	I12. Transport networks	High and low temperatures, high winds, lightning	**More action needed**
RISKS	I13. Digital	High and low temperatures, high winds, lightning	**Further investigation**
Theme: Health, Communities and the Built Environment			
Risk or Opportunity	**Risk number and Receptor**	**Nature of risk/opportunity**	**Revised urgency score**
RISKS	H1. Health and wellbeing	High temperatures	**More action needed**
RISKS	H3. People, communities and buildings	Flooding	**More action needed**
RISKS	H5. Building fabric	Moisture, wind and driving rain	**Further investigation**
RISKS	H7. Health and wellbeing	Changes in indoor and outdoor air quality	**Further investigation**
RISKS	H8. Health	Vector-borne disease	**More action needed**
RISKS	H9. Food safety and food security	Higher temperatures (food safety) and extreme weather (food security)	**Further investigation**
RISKS	H10. Health	Poor water quality and household water supply interruptions	**Further investigation**
RISKS	H11. Cultural heritage	Changes in temperature, precipitation, groundwater, land, ocean and coastal change	**More action needed**
RISKS	H12. Health and social care delivery	Extreme weather	**More action needed**
RISKS	H13. Delivery of Education and prison services	Extreme weather	**More action needed**
RISKS & OPPORTUNITIES	H6. Household energy demand	Summer and winter temperature changes	**More action needed**
OPPORTUNITIES	H2. Health and wellbeing	High temperatures	**Further investigation**
Theme: Business and Industry			
Risk or Opportunity	**Risk number and Receptor**	**Nature of risk/opportunity**	**Revised urgency score**
RISKS	B1. Flooding of business sites	Increase in flood risk	**More action needed**
RISKS	B3. Business production processes	Water scarcity	**Further investigation**
RISKS	B4. Business access to finance, investment and insurance	Extreme weather	**Sustain current action**
RISKS	B5. Reduced employee productivity in businesses	Infrastructure disruption and higher temperatures in working environments	**Further investigation**
RISKS	B6. Disruption to business supply chains and distribution networks	Extreme weather	**More action needed**
OPPORTUNITIES	B7. Changes in demand for goods and services	Long-term climate change	**Further investigation**

4 Priority Actions for 2025/26

4.1 Introduction

Following extensive stakeholder engagement and consideration of the evidence base, this section summarises those actions that are deemed a **'very high-immediate' (VH-I)** priority for implementation in the first financial year, 2025/26. Other actions that are deemed 'very high,' 'high' or 'medium' in priority are included in Annex 1, the implementation blueprint.

The table overleaf sets out:

- Actions that should be implemented, or be on the way to implementation, by the end of the financial year 2025/26 (i.e. by 31 March 2026), all of which will begin to help adapt Oxfordshire's natural environment, infrastructure, people and businesses to a changing climate. The table also includes a justification and further explanation as to how these actions have been developed.

- The suggested order in which to begin implementation of each action has been provided (far-left column); although many of them should be carried out concurrently.

- Key stakeholders who are likely to have a role in implementing these actions (ordered alphabetically against each action).

- Where an action requires resourcing/ funding, an indication as to whether there is resourcing/ funding secured already (Yes), whether funding has been secured to support part of the action, or to enable the action to be kick-started (Partially), whether it is planned and upcoming (Planned) or where resourcing/ funding needs to be sourced (No). A reference to 'Low/no cost' in this column indicates that only a small amount of additional resource is likely to be required to undertake this action.

- Whether implementing this action is expected to be intense from a resourcing and cost perspective, from L (Low), Medium (M) to H (High).

- Whether the action is a 'no regret (No Regret)' action that will need to be implemented regardless of the future trajectory of climate change and the nature of resulting climate impacts., whether the action is 'no regret, but may require minor modifications (No Regret (M))' should climate projections significantly change, or whether the action requires 'continuous monitoring (Cont. Monitor)' when implemented to determine its effectiveness under a range of future climate scenarios.

Further details on the actions, the methodology and the full set of all proposed actions is included in Annex 1.

4.2 List of acronyms

Each action details the stakeholders who are likely to have a role in implementation, the acronyms of which are listed below.

Acronym	Organisation
BBOWT	Berkshire, Buckinghamshire and Oxfordshire Wildlife Trust
BOB ICB	Buckinghamshire, Oxfordshire and Berkshire West Integrated Care Board
BRE	Building Research Establishment
CAG	Community Action Group Oxfordshire
DB&T	Department for Business & Trade
Defra	Department for Environment, Food & Rural Affairs
DHSC	Department of Health & Social Care
District Councils	All district councils in Oxfordshire: West Oxfordshire District Council, Vale of the White Horse District Council, Cherwell District Council, South Oxfordshire District Council and Oxford City Council
EA	Environment Agency
FC	Forestry Commission
GSENZH	Greater South East Net Zero Hub
HE	Historic England
JORT	Joint Oxfordshire Resilience Team
LCGs	Local community groups
LEP	Oxfordshire Local Enterprise Partnership
LHRF	Local Health Resilience Partnership
LRF	Local Resilience Forum
MHCLG	Ministry of Housing, Communities & Local Government
NE	Natural England
NFF	National Flood Forum
NFU	National Farmers' Union
NHS	National Health Service
NLCF	National Lottery Communities Fund
NT	National Trust
OACP	Oxfordshire Association of Care Providers
OALC	Oxfordshire Association of Local Councils
OBU	Oxford Brookes University
OHFT	Oxford Health NHS Foundation Trust
OLNP	Oxfordshire Local Nature Partnership
OUH	Oxford University Hospitals
Oxfordshire CC CA	Oxfordshire County Council Climate Action Team
Oxfordshire CC L&NR	Oxfordshire County Council Landscape & Nature Recovery
Oxfordshire CC PH	Oxfordshire County Council Public Health

Acronym	Organisation
RSPB	Royal Society for the Protection of Birds
SWM	Sustainability West Midlands
TW	Thames Water
UKHSA	UK Health Security Agency
UOx	University of Oxford
WO	Wild Oxfordshire

Overleaf commences the Priority Actions for the 2025/26 financial year.

4.3 The Priority Actions for 2025/26

Key to colour coding in the 'No.' column:

Enabling actions: governance, reporting and monitoring	Natural Environment and Assets	Health, Communities and the Built Environment	Business and Industry, including Agriculture

No.	Action	Further information and action justification	Relevant stakeholders that could support action implementation	Possible example funder(s)	Funding/ resource secured	Resource Intensity	Type of action
1.	Report on progress with delivery of this Route Map and implementation blueprint annually to the FOP and set up a monitoring framework.	This will ensure actions are kept relevant and are being delivered with success measures identified. One of the first actions that should be undertaken is the development of a monitoring system that goes alongside this Route Map to track progress (see recommendations section). A mechanism to celebrate success of actions that have been implemented should also be established alongside the overall monitoring system.	All partners	Defra EA	Low/no cost	**L/M**	**No Regret**
2.	Develop a new Oxfordshire-wide Climate Adaptation Working Group under the Zero Carbon Oxfordshire Partnership (ZCOP) structure.	This group will help to make implementation of actions through catalysis and collaboration. It will also ensure implementation is considerate of all key stakeholder's needs. The first steps will be to develop a Terms of Reference within which all partners' roles and responsibilities should be clearly defined. Where district councils are not currently part of ZCOP (e.g. South and Vale), they will still be invited to join the new adaptation group.	ZCOP and other stakeholders as required, including all the district councils	EA Defra All potential group members	Yes	**L/M**	**No Regret**
3.	Ensure that climate change adaptation forms a key part of the emerging Local Nature Recovery Strategy (LNRS) for Oxfordshire.	Nature is struggling in no small part due to climate change. It will not recover unless the recovery options consider how nature may fare in a future climate (see action 18 in the full implementation blueprint). It is a huge opportunity to use LNRSs to allow nature to become a significant part of the adaptation solution, by ensuring that new nature creation/ enhancement programmes help to create a bigger, better, and more joined up natural environment which will be more resilient to the impacts from climate change. Considering the LNRS through this lens will also help to address any conservation-focused actions that may conflict with what is required from an adaptation perspective.	BBOWT EA FC NE NT/HE Oxfordshire CC L&NR RSPB WO	-	Yes	**L**	**No Regret (M)**

No.	Action	Further information and action justification	Relevant stakeholders that could support action implementation	Possible example funder(s)	Funding/ resource secured	Resource Intensity	Type of action
4.	Expand efforts to Identify financing options and funding sources to enable implementation and integrate into the next budget cycle.	Ultimately, funding will be required to take forward many of the actions outlined in this Plan. The aforementioned Working Groups and the 100 Together initiative and the forthcoming Green Investment Pipeline and Prospectus can be used to facilitate potential partnerships and to develop a financing strategy to help take forward projects across the county and encourage research of innovative approaches to implementation. Existing public and private funding options that currently focus on other areas can also be utilised, e.g. carbon markets, river catchment and nature restoration funds etc, and adaptation activity integrated where feasible.	District Councils GSENZH LEP OBU OLNP Oxfordshire CC CA UOx	To be determined by this action	Low/no cost	**L/M**	**No Regret**
5.	Develop a set of adaptation capacity building materials that are specifically targeted at executive officers, Cabinet Members and Councillors across the county.	Senior officers in a range of public, private and voluntary organisations, along with Cabinet Members and Councillors in local authorities, are crucial to enabling local action on climate adaptation. Without their support, many of these actions either could not be implemented at all or as effectively, and therefore their buy-in underpins many actions within this Plan. Materials will also need to be versatile or targeted to accommodate the key differences between organisations (e.g. service-oriented and planning-oriented teams). In some cases, training will need to be integrated into existing programmes such as carbon literacy training that many councils have already undertake. Adaptation could also be embedded into new staff inductions to highlight its importance.	CAG District Councils Oxfordshire CC CA, Comms SWM	-	No	**L/M**	**No Regret (M)**
6.	Embed and/or support delivery of climate adaptation into a range of co-dependent strategies and plans being produced by council departments/ external partners.	A list of plans and strategies to which this action applies can be found in Annex 2. Each plan will individually need consideration as to how to best embed adaptation into them. Some of these plans are statutory and can be used as strong hooks for action. Also, adaptation should be embedded into any future iterations of Oxfordshire CC's Climate Action Framework. This embedment is crucial to ensure that decision making is factoring the impact climate change could have on various future policies. Without this, many of these strategies and action plans may not be fit for purpose.	Numerous council departments and external partners	-	No	**M**	**No Regret (M)**

No.	Action	Further information and action justification	Relevant stakeholders that could support action implementation	Possible example funder(s)	Funding/ resource secured	Resource Intensity	Type of action
7.	Each district council should begin to consider developing an adaptation plan.	This Route Map covers actions that need to take place across the whole county to accelerate adaptation to climate change. However, it does not go into detail about how climate change could affect specific service areas, and locations, that are under the jurisdiction of the district councils. Therefore, each district council should begin to prepare a plan outlining what it may need to do additionally to adapt its services to climate change.	District councils Oxfordshire CC CA	-	No	**M**	**No Regret**
8.	Provide adaptation training for health and social care delivery professionals and senior leaders.	The health and social care sector needs to adapt to the increasing threats it faces from a changing climate. Buy-in and understanding can be achieved through capacity building training - explaining what adaptation means, its relevance to the NHS and what can be done at the Trust/ICB level by way of implementation.	BOB ICB NHS England OACP OHFT OUH Oxfordshire CC PH SWM/Sniffer	DHSC UKHSA NHS	Partially	**L/M**	**No Regret (M)**
9.	Ensure climate risks to health, buildings and infrastructure that affect health and care settings are embedded into corporate risk / business continuity plans.	Embedment into these plans, which all care settings are already required to produce, will ensure such risks can be considered more routinely and discussed and monitored by risk professionals within the heart of the health and social care sector.	GPs LHRF OHFT OHU Other health and care providers UKHSA	-	Low/no cost	**L**	**No Regret (M)**
10.	Identify and appraise climate adaptation options for the most vulnerable health and care assets.	Such locations accommodate some of the county's most vulnerable people, especially if they are elderly and have underlying physical or mental health conditions. In particular, all such assets are likely to overheat more often in future if they have not been constructed with climate change in mind, meaning that there is a greater likelihood of mortality and extreme discomfort as a consequence of extreme heatwave conditions. Therefore, building on the Director of Public Health's Climate Change report which helps to identify the most vulnerable health and care settings at risk from climate change, vulnerable assets should be evaluated for overheating and	BOB ICB BRE EA OACP and other health bodies OHFT OHU	DHSC UKHSA NHS England	No	**H**	**Cont. Monitor**

No.	Action	Further information and action justification	Relevant stakeholders that could support action implementation	Possible example funder(s)	Funding/ resource secured	Resource Intensity	Type of action
		flooding risks. To help support this, the EA are producing a piece on climate transition which will look at doctors, nurseries, care homes etc.	Oxfordshire CC PH, social care Technical consultancies UKHSA				
11.	Produce an adaptation plan for the NHS Integrated Care System and Trusts that cover Oxfordshire.	The above action can help to identify adaptation options for individual assets. Armed with this intelligence, an adaptation plan should be produced for the healthcare sector in Oxfordshire that sets out and prioritises which assets to adapt first and which options to take forward. The plan should also set out options to address how climate change could affect service delivery and patient care due to increasing extreme heat, flooding, water scarcity and other climate related risks. The new Green Plan adaptation guidance on the WeAdapt platform and SWM's Adapt to Survive toolkit can be used to assist with this.	BOB ICB NHS England OHFT OHU Oxfordshire CC PH SWM	DHSC UKHSA NHS England	No	**L/M**	**No Regret**
12.	Conduct an analysis of which of Oxfordshire's habitats, species and crops could be most affected by climate change, including the negative impacts of new pests, pathogens or invasive non-native species (INNS).	Climate change is likely to affect multiple species in a range of different ways. Oxfordshire would benefit from having greater awareness of which of its habitats and species are most (and least) likely to be at risk of decline or stress under a range of climate scenarios. In addition, pests, pathogens and INNS are more likely to establish themselves due to climate change. Launching local analyses on how these could affect habitats and species in the county would represent a first step to help prepare and protect ecosystems from their most negative consequences, especially high-quality habitats already at risk from climate change, and that could potentially benefit from opportunities new species may bring. Lessons could also be learned from approaches taken abroad, along with resources produced by NE including their Climate Change Adaptation Manual and Climate Change Vulnerability Model. Following this, more targeted measures could be identified and data from the Forestry Commission's TreeAlert system could be obtained to aid with this.	BBOWT Defra EA FC NE Oxfordshire CC L&NR RSPB UOx WO	Defra NE FC	No	**M/H**	**Cont. Monitor**

No.	Action	Further information and action justification	Relevant stakeholders that could support action implementation	Possible example funder(s)	Funding/ resource secured	Resource Intensity	Type of action
13.	Produce new county-wide climate change adaptation guidance for developers.	Guidance on how to ensure new developments integrate climate adaptation measures should encourage developers to design new homes and commercial premises in a particular way and, in this case, will assist with the objective that all new residential and commercial developments consider their longevity and performance in a future climate (e.g. through solar gain, ventilation, rainwater harvesting, avoiding non-permeable driveways etc.). Developers should be guided in the right direction and adhere to the guidance for all new developments, via a robust procurement and monitoring process. A guide developed across the whole county born from collaboration between the district councils would help with consistency of messaging, sharing of resources and assist with integration into the next round of Local Plans.	Developers District Council EA Oxfordshire CC Property Services	EA MHCLG DB&T	No	**L/M**	**Cont. Monitor**
14.	Expand on the Oxfordshire Way, existing work and relationships to empower vulnerable communities to develop climate change adaptation and/or community emergency plans.	Communities in Oxfordshire could increasingly struggle to cope in the event of an extreme weather incident. This could be due to the demographic of the residents, their rural isolation or being in (e.g.) a flood risk area. Such communities will need better protection and support to prevent issues such as displacement or health implications. Oxfordshire CC has mapped where the most vulnerable communities to climate change may be located, and have already established Flood Groups across the county, alongside developing tools such as the Local Climate Action Toolkit. These areas should be targeted as initial pilots for developing climate adaptation plans that expand beyond flood risk, with the process then being rolled out to other communities that would benefit most from having a plan in place. Delivery of capacity building training with these communities, using existing and well-established networks, may need to be commissioned first (which could be linked to the below).	District councils EA LCGs LRF/ Fire Service NFF OALC Oxfordshire CC JORT, CA, Flood Risk Parish councils TW	EA Defra MHCLG NLCF	Partially	**M**	**No Regret (M)**
15.	Establish a climate risk and adaptation engagement programme for farmers and land managers.	Farming represents a significant proportion of the Oxfordshire landscape (over 70% of Oxfordshire's land as of 2024). Adopting new land management practices to help alleviate flood risk could positively affect many local communities, and the farm itself.	BBOWT Catchment partnerships Defra District councils	Defra EA	No	**M**	**No Regret (M)**

No.	Action	Further information and action justification	Relevant stakeholders that could support action implementation	Possible example funder(s)	Funding/ resource secured	Resource Intensity	Type of action
		Climate change also poses risks to the types of crops that can grow, therefore raising awareness of alternatives or ways to protect existing crops would also be beneficial from a food security and economic perspective. However, at present, there is limited coordinated support on this agenda for farmers, along with how the Local Nature Recovery Strategy, Biodiversity Net Gain (BNG), Environmental Land Management Schemes (ELMS) and other mechanisms can contribute to adaptation. An engagement programme showing how farmers can effectively adapt both their business activities (e.g. crop types etc.) to climate change and contribute positively to local land management to help will provide a good place to start.	EA Food Alliance NE NFU and other farm cluster facilitators Oxfordshire CC CA, Flood Risk TW				

5 Next steps and initial recommendations

This Route Map, and the engagement that informed its development, is just the first step in ensuring that Oxfordshire's people, places and businesses can adapt to climate change.

Sunrise over fields in Drayton, Oxfordshire

It is therefore hugely important that authorities and organisations that are able to take forward these actions do so now, either by identifying the necessary resourcing, working collaboratively or sourcing funding from elsewhere. The declaration of climate emergencies from all councils in Oxfordshire emphasises the importance of taking ambitious actions such as those identified in this document.

As such, it is recommended that the following next steps and principles are taken to support successful implementation of the Route Map.

Maintain engagement with stakeholders

Throughout the development of the Route Map, various rounds of stakeholder engagement have been undertaken, and connections and relationships have been established and built upon. This Route Map has very much been co-created, as without stakeholder input the implementation blueprint would likely have looked very different, less location-specific and not reflective of existing local activity.

In their role as a coordinating body, Oxfordshire CC will build on this engagement by convening a new Oxfordshire-wide Climate Adaptation Working Group, fitting into the structure of the new Zero Carbon Oxfordshire Partnership (ZCOP). This will include all the district councils, even if they are not currently part of the ZCOP, along with key stakeholders who are likely to be chiefly responsible for implementing the actions in this plan. This should launch alongside publication of this Route Map so that it is still fresh in people's minds and, initially, should be used to agree who will lead on each of the VH-I 2025/26 actions.

As the term 'working group' suggests, the group will be active, action-focused and collaborative; in other words, it should exist to take forward the highest priority actions. The group's Terms of Reference will be reflective of this ambition.

Identify priorities

The first step is to agree a list of actions with partners that are going to be implemented in the first year, or where implementation will be commenced quickly. We have provided our perspective on how each action should be prioritised for implementation in the full implementation blueprint provided in Annex 1:

VH-I	Very High and Immediate
VH	Very High
H	High
M	Medium

This is based on the following aspects:

- The urgency of the risk based on the risk assessment
- The resource intensity of implementation and the likely cost/benefit
- Potential financing options available
- The co-benefits that implementing the action would bring
- The potential scale of the impact
- Whether the action builds on existing work
- Whether the action is a quick-win and can be implemented at pace
- Whether there is clear stakeholder expertise to mobilise implementation
- Whether implementation has national or local policy backing

Integration

Wherever possible, adaptation measures will be integrated into Net Zero and other relevant activities to maximise the impact of the activity whilst minimising resource requirements. This also ensures adaptation actions do not threaten to contradict Net Zero targets, or visa-versa. Many actions provide suggestions on how to do this.

Adaptation financing

Identifying financing options will be crucial to the successful implementation of some of these actions. Mapping of these opportunities and lobbying of central Government needs to take place hand-in-hand, to encourage appropriate investment. There also needs to be strategic use of public sector funds to lever in appropriate private sector investment. The 100 Together initiative set up in Oxfordshire and the forthcoming Green Investment Pipeline and Prospectus provides a key mechanism to identify private financing sources that may be suitable for adaptation.

Outcomes and measures of success

Undertaking a cost-benefit analysis of each action will provide some element of quantification and give backing to implementation. A high-level analysis of this has commenced in the form of the economic rationale (see section 3.1), but a more in-depth analysis will be needed when embarking on implementation of actions where investment is required. Where undertaking a cost-benefit analysis is not possible, it is still important to consider what the specific outcomes are for each action, in order to make the case for implementation.

View from Wittenham Clumps, north of Didcot and Wallingford

Building in flexibility

Despite having an understanding of the likely broad climatic changes expected to occur in Oxfordshire, it is impossible to be specific about exactly what is going to happen and to what timeframe, due to various elements of uncertainty.

Not knowing exactly when, and to what extent, we need to take action makes both implementation of adaptation actions, and making the case for implementation, more challenging. This is why the implementation blueprint highlights many 'no regret' actions that can be implemented in the face of this uncertainty. However, this may be more challenging with others where (e.g.) significant investment is required.

It will therefore be important to build flexibility into adaptation actions by taking an adaptation pathways approach, which can help to manage the long-term and uncertain nature of climate change impacts. It will allow projects to be scaled up or down depending on how the climate changes in reality, and will also show what level of adaptation needs to take place against a range of plausible scenarios.

Monitoring and evaluation (M&E)

Developing a process for M&E that outlines how and when actions will be assessed and allows progress to be captured against each action is critical. A first step will be to develop a monitoring system or integrate adaptation actions into an already established monitoring system, which allows for the capturing of progress against each action. This will include milestones and dates agreed with the FOP on the 2025/26 (VH-I) actions. A reporting mechanism will also be established to ensure progress is being communicated to partners and senior leaders. Oxfordshire CC will take responsibility for the M&E process as the county-wide coordinating body, and seek regular updates on progress from the FOP members and other relevant partners responsible for implementation as required.

The Local Partnerships Climate Adaptation Toolkit for Local Authorities (page 40+) provides more information on M&E and how this can be achieved.

6 Further information sources

- Climate Change Committee: UK Climate Risk (CCRA3)
- Climate Change Committee: Adaptation Progress Report
- Defra: A Green Future: Our 25 Year Plan to Improve the Environment
- Defra: Climate Change Adaptation Reporting Power reports
- Defra: National Adaptation Programme (NAP)
- Defra: UK Climate Change Risk Assessment 2022
- Environment Agency: Climate Change Allowances for Flood Risk Schemes
- Environment Agency: Flood Risk Mapping
- Environment Agency: National Flood and Coastal Erosion Risk Management Strategy for England
- Environment Agency: National Framework for Water Resources
- Environment Agency: Sign up for flood warnings service
- Intergovernmental Panel on Climate Change (IPCC)
- King's College London: Maximising UK Adaptation to Climate Change (MACC) hub
- Local Partnerships: Climate change adaptation pages and toolkit
- Met Office: Local Authority Climate Service
- Met Office: Weather warnings alert service
- Oxfordshire County Council: Climate Vulnerability Assessment
- Oxfordshire County Council: Local Climate Adaptation Tool (LCAT)
- SWM: Adapt to Survive: A Tool for Building Resilience to Climate Change into Health Care Systems
- SWM: Climate change adaptation: practical examples for local authorities
- SWM: Weathering the Storm for Agriculture: A practical guide for farmers and land managers
- TCPA: The Climate Crisis – a guide for local authorities on planning for climate change
- UKRI: UK Climate Resilience Programme
- WeADAPT

Annex 1: Detailed Implementation Blueprint

Introduction

Provided overleaf is the full Implementation Blueprint that sets out:

- Actions that have been identified that, if implemented, will help to adapt Oxfordshire's natural environment, infrastructure, people and businesses to a changing climate, and a justification and further explanation as to why these actions have been selected.

- Where the action is given in **bold type**, this means it is also listed in the 2025/26 priority actions, section 4.3.

- Key stakeholders who are likely to have a role in implementing these actions.

- Where an action requires resourcing/ funding, an indication as to whether (as far as we are aware) there is resourcing/ funding secured already (Yes), whether funding has been secured to support part of the action, or to enable the action to be kick-started (Partially), whether it is planned and upcoming (Planned) or where resourcing/ funding needs to be sourced (No). A reference to 'Low/no cost' in this column indicates that only a small amount of additional resource is likely to be required to undertake this action.

- Whether implementing this action is expected to be intense from a resourcing and cost perspective, from Low (L), Medium (M) to High (H).

- Whether the action should be (either due to urgency or its simplicity) implemented in the short (within the next two years), medium (two-10 years) or long (>10 years) term.

- Whether the action is a 'no regret (No Regret)' action that could be implemented regardless of the uncertainty in the climate system and projections, whether the action is 'no regret, but may require minor modifications (No Regret (M))' should climate projections significantly change, or whether the action requires 'continuous monitoring (Cont. Monitor)' when implemented to determine its effectiveness under a range of future climate scenarios.

- Based on various aspects, we have prioritised each action as follows:

VH-I	Very High and Immediate
VH	Very High
H	High
M	Medium

- Very High-Immediate refers to actions that are urgent and should be implemented and/or be mobilised within the first year of publication of this Route Map, i.e. by the end of the financial year 2025/26. These are set out and mirrored in section 4.3 of this document.

- We have also used the principles set out in the Local Partnerships Adaptation Toolkit (Section 4.3) when selecting and considering actions:

Effectiveness – will the actions meet your objectives and if so how?	☐	**Legitimacy** – is it politically, ethically and socially acceptable?	☐
Efficiency – do the benefits exceed the costs? If not, how can they?	☐	**Urgency** – how soon could each option be implemented?	☐
Equity – the action should not adversely affect other areas or vulnerable groups	☐	**Costs** – consider social and environmental costs, not just economic	☐
Flexibility – is each option flexible and will it allow for adjustments and incremental implementation?	☐	**Robust** – is each option able to cope with a range of future climate projections?	☐
Sustainability – does each option contribute to sustainability objectives, and are they themselves sustainable?	☐	**Synergies/coherence with other strategic objectives** – does each option help to achieve other objectives?	☐
Practical – can the action be implemented on relevant timescales?	☐		

- We have ensured that the actions listed do not (e.g.) contradict other local priorities, disadvantage vulnerable people, and consider cost and efficiency, rather than merely suggesting a set of unrealistic and potentially counterproductive actions that could lead to maladaptation, prioritising no-regret actions that can be taken forward regardless of precisely how the climate changes.

- We recognise that some of these actions may be being implemented or considered by organisations that we did not consult with during the evidence-gathering stage. An established monitoring process should allow for actions to be continuously reviewed, with progress reported back through to stakeholders through the relevant established partnerships. It is also recommended that a refresh of the Route Map takes place after five years (2030).

With regards to all of the actions listed in this Annex, it should be noted that:

- Many of the actions are currently unfunded, with resourcing yet to be identified.
- The initial focus is on the 2025/26 actions, with the actions included in Annex 1 being opportunities to implement only when circumstances allow.
- Implementation of most of the actions will only take place when resources and/or funding has been secured and agreed by relevant stakeholders.
- Stakeholders have not yet committed to deliver many of the actions so far, but they will look to incorporate if and when an opportunity arises (or when resources are found).
- Stakeholders identified as being key to implementing the actions may only play a supporting, coordinating or consulting role in delivering the action, and not necessarily lead its implementation.
- Actions are currently high-level and subject to change as understanding and circumstances evolve.

Actions not included

National ARP-reporting bodies

The actions included in this Plan are those where there is no strong evidence of a coordinated response. Where there is evidence to suggest action is taking place, namely actions included in the plans published by organisations under the jurisdiction of the Adaptation Reporting Power (ARP), we have not included these

in this Plan and will assume these actions continue to be implemented. This mostly pertains to infrastructure providers, such as Network Rail, National Highways, Cadent Gas, National Grid and others (direct links to the most relevant have been provided in Annex 2). Therefore, example actions that are **not** included in this Plan include, for example, ensuring the Oxfordshire's rail network is resilient to extreme heat events, and ensuring electricity substations in Oxfordshire are protected from flood risk.

The other reason we have not included actions such as these in the Plan is due to the limited influence local stakeholders in Oxfordshire, including the councils, could have on their completion. Network Rail, for example, have a national planned coordination of works associated with strengthening rail infrastructure resilience to climate change. Aside from local organisations raising any local issues directly to them, there is little they can do by way of implementation. That means, however, it is important to ensure that the organisations reporting under the ARP are consulted in activities that may be affected by, or where they could add value to, any new adaptation actions implemented locally.

Atlantic Meridional Overturning Circulation (AMOC)

The AMOC, which includes the Gulf Stream, moves heat northwards in the Atlantic and means that Europe is milder than it would otherwise be. It is considered very likely that the AMOC will weaken as a result of climate change. This weakening would reduce the heat moved northwards, so the UK would experience less warming (but not no warming) than if the AMOC did not weaken but may also cause other changes in our weather patterns such as more winter storms. A less likely possibility is that the AMOC could collapse completely, leading the UK to experience colder temperatures in future rather than warmer temperatures, leading to a knock-on of potentially devastating effects. However, although weakening is likely, complete collapse is deemed as 'unlikely' by the Met Office, and the IPCC states that they have 'medium confidence that a collapse will not occur.'

The current science states, therefore, the continued warming of the UK climate is most likely over the coming decades, and it is this assumption that this Route Map is based upon. Deriving a list of potential actions that could also be implemented should the AMOC collapse occur is outside the scope of this project and, moreover, would likely dilute and contradict the actions that are more likely to be required based on the current science, along with expanding on an already long list of adaptation options. A watching brief on the AMOC is advised over the coming years.

List of acronyms

The implementation blueprint includes relevant stakeholders that could support action implementation. Most of these are given in acronyms, and they are listed below. It should be noted that organisations listed in the Plan are only *potential* implementors of the specified actions; it may be that the action is best led by an organisation not listed in the Plan.

Acronym	Organisation
BBOWT	Berkshire, Buckinghamshire and Oxfordshire Wildlife Trust
BOB ICB	Buckinghamshire, Oxfordshire and Berkshire West Integrated Care Board
BITC	Business in the Community
BRE	Building Research Establishment
CAG	Community Action Group Oxfordshire

Acronym	Organisation
C&RT	Canal and River Trust
DB&T	Department for Business & Trade
Defra	Department for Environment, Food & Rural Affairs
DESNZ	Department for Energy Security & Net Zero
DfE	Department for Education
DfT	Department for Transport
DHSC	Department of Health and Social Care
District Councils	All district councils in Oxfordshire: West Oxfordshire District Council, Vale of the White Horse District Council, Cherwell District Council, South Oxfordshire District Council and Oxford City Council
DLUHC	Department for Levelling Up, Housing & Communities
EA	Environment Agency
EAUC	The Alliance for Sustainability Leadership & Education
FC	Forestry Commission
FSA	Food Standards Agency
FSB	Federation of Small Businesses
GHO	Growth Hub Oxfordshire
GSENZH	Greater South East Net Zero Hub
GWS	Groundwork South of England
HE	Historic England
IDBS	Internal Drainage Board
JORT	Joint Oxfordshire Resilience Team
LCGs	Local community groups
LEP	Oxfordshire Local Enterprise Partnership
LHRF	Local Health Resilience Partnership
LRF	Local Resilience Forum
MHCLG	Ministry of Housing, Communities & Local Government
NE	Natural England
NFF	National Flood Forum
NFU	National Farmers' Union
NH	National Highways
NHS	National Health Service
NLCF	National Lottery Communities Fund
NLHF	National Lottery Heritage Fund
NR	Network Rail

Acronym	Organisation
NT	National Trust
OALC	Oxfordshire Association of Local Councils
OBU	Oxford Brookes University
OHFT	Oxford Health NHS Foundation Trust
OLNP	Oxfordshire Local Nature Partnership
OUH	Oxford University Hospitals
Oxfordshire CC	Oxfordshire County Council
Oxfordshire CC CA	Oxfordshire County Council Climate Action Team
Oxfordshire CC L&NR	Oxfordshire County Council Landscape & Nature Recovery
Oxfordshire CC PH	Oxfordshire County Council Public Health
RSPB	Royal Society for the Protection of Birds
SCAS	South Central Ambulance Service
SHAP	Sustainable Housing Action Partnership
SSEN	Scottish and Southern Electricity Networks
SWM	Sustainability West Midlands
TVERC	Thames Valley Environmental Records Centre
TW	Thames Water
UKHSA	UK Health Security Agency
UOx	University of Oxford
WO	Wild Oxfordshire

Overleaf commences the main Adaptation Plan for Oxfordshire.

The full implementation blueprint

No.	Action	Further information and action justification	Relevant stakeholders that could support action implementation	Possible example funder(s)	Funding/ resource secured	Resource Intensity	Time	Type of action	Priority
Enabling actions: governance, reporting and monitoring									
People, engagement and communications									
1.	**Develop a new Oxfordshire-wide Climate Adaptation Working Group under the Zero Carbon Oxfordshire Partnership (ZCOP) structure.**	This group will help to make implementation of the actions in this plan easier through catalysis and collaboration. It will also ensure implementation is considerate of all key stakeholder's needs. The first steps will be to develop a Terms of Reference within which all partners' roles and responsibilities should be clearly defined. Where district councils are not currently part of ZCOP (e.g. South and Vale), they will still be invited to join the new adaptation group.	ZCOP and other stakeholders as required, including all the district councils	EA Defra All potential group members	Yes	**L/M**	Short-term, on-going	**No Regret**	**VH-I**
2.	Ensure adaptation is fully integrated into existing relevant boards/groups.	This will help drive forward some of these actions and lobby national and local funders and policymakers to ensure adaptation to climate change is at the heart of all activities, and that the focus is not solely on Net Zero. Embedment into council Strategic Plans is paramount, as well as establishing appropriate KPIs to monitor progress as part relevant outcomes frameworks. Overall, it will help to strengthen resilience to climate change across council's corporate thinking and decision making and, thus, influence decisions that are made across the county.	All organisations can look at embedding adaptation into their KPI and reporting processes	-	Low/no cost	**L**	Short-term, on-going	**No Regret**	**VH**
3.	**Identify financing options and funding sources to enable implementation and integrate into the next budget cycle.**	Ultimately, funding will be required to take forward many of the actions outlined in this Plan. The aforementioned Working Groups and the 100 Together initiative and the forthcoming Green Investment Pipeline and Prospectus can be used to facilitate potential partnerships and to develop a financing strategy to help take forward projects across the county and encourage research of innovative approaches to implementation. Existing public and private funding options that currently focus on other areas can also be utilised, e.g. carbon markets, river catchment and nature restoration funds etc, and adaptation activity integrated where feasible. Ideally, the highest priority	District Councils GSENZH LEP OBU OLNP Oxfordshire CC CA UOx	To be determined by this action	Low/no cost	**L/M**	Short-term	**No Regret**	**VH-I**

No.	Action	Further information and action justification	Relevant stakeholders that could support action implementation	Possible example funder(s)	Funding/ resource secured	Resource Intensity	Time	Type of action	Priority
		actions outlined in this plan should be costed and funding identified by the next budgetary planning cycle, which for Oxfordshire CC is from September 2025.							
4.	**Each district council should begin to consider a specification for developing an adaptation plan.**	This Route Map covers actions that need to take place across the whole county to accelerate adaptation to climate change. However, it does not go into detail about how climate change could affect specific service areas, and locations, that are under the jurisdiction of the district councils. Therefore, each district council should begin to prepare a plan outlining what it may need to do additionally to adapt its services to climate change.	District councils Oxfordshire CC CA	-	No	**M**	Short-term	**No Regret**	**VH-I**
5.	Identify adaptation leads and other equivalent working groups in neighbouring counties.	This will ensure there is a recognition that climate risks and adaptation solutions do not stop at boundaries. This is especially relevant in relation to catchment-based schemes for example, to prevent maladaptation (e.g. flood protection in one area leading to worsening issues in another) and to share wider good practice and expertise. Better engagement with Gloucestershire, Berkshire, Buckinghamshire, Northamptonshire and Warwickshire counties would be a first step. Establishing details of relevant existing cross-boundary partnerships (e.g. the Oxford to Cambridge Pan-regional Partnership's stakeholder network, or others developed by the LRF) could also assist with this.	Oxfordshire CC CA Relevant partners as specified, including local National Landscapes and GSENZH	-	Low/no cost	**L**	Short-term	**No Regret**	**H**
6.	Ensure climate adaptation and resilience is a key theme when engaging with young people in the county.	Our future generations will be significantly affected by climate change and have plenty to lose by ineffective adaptation. We need to give them a voice on this issue via existing platforms. This could be via: • Integrating adaptation as a theme into relevant youth boards across the county. • Establishing a 'young person's voice' on the Working Group (see action 1). • Using the Climate Ambassadors Programme as a lever to educate young people on adaptation. Adaptation could also be integrated into Oxfordshire CC's existing Action on Carbon and Energy in Schools Programme as a starting point for engagement.	Colleges EAUC OBU Oxfordshire CC Education UOx Youth organisations, such as Oxfordshire Youth	-	Low/no cost	**L**	Short-term	**No Regret**	**H**

No.	Action	Further information and action justification	Relevant stakeholders that could support action implementation	Possible example funder(s)	Funding/ resource secured	Resource Intensity	Time	Type of action	Priority
7.	**Develop a set of adaptation capacity building materials that are specifically targeted at executive officers, Cabinet Members and Councillors across the county.**	Senior officers in a range of public, private and voluntary organisations, along with Cabinet Members and Councillors in local authorities, are crucial to enabling local action on climate adaptation. Without their support, many of these actions either could not be implemented at all or as effectively, and therefore their buy-in underpins many actions within this Plan. Materials will also need to be versatile or targeted to accommodate the key differences between organisations (e.g. service-oriented and planning-oriented teams). In some cases, training will need to be integrated into existing programmes such as carbon literacy training that many councils already undertake. Adaptation could also be embedded into new staff inductions to highlight its importance.	CAG District Councils Oxfordshire CC CA, Comms SWM	-	No	**L/M**	Short-term	**No Regret (M)**	**VH-I**
8.	Establish and rollout a climate change adaptation public communications strategy and plan.	A communications strategy that focuses on wider sustainability issues, but where adaptation and personal resilience is incorporated as a key theme, should be produced. Successful engagement may come in the form of an initial focus on various co-benefits, but the adaptation and resilience message should be formed through this. This could also include the use of behavioural change specialists and a focus on healthy place-shaping and the links to adaptation. Lessons could be learnt on how messaging on Covid-19 was established, which resulted in rapid and fundamental change.	Climate Outreach District Councils EA LCGs OBU Oxfordshire CC CA, Comms UOx	Defra EA	Partially	**L/M**	Short-term	**No Regret (M)**	**H**
9.	Develop an online hub of adaptation resources.	Expand the existing climate adaptation webpages on the Oxfordshire CC website, the Oxfordshire Flood Toolkit and the Climate Action Oxfordshire website to include a 'hub' of resources on climate adaptation, including this Adaptation Plan. Link this to existing hubs such as WeAdapt and key resources such as the NAP, CCRA, CVA, relevant organisation's ARP submissions and case studies and any relevant local activity. The Flood Toolkit in particular acts as a useful 'one-stop-shop' for advice, guidance and good practice with regards to flooding, but further expansion of this to address all climate related hazards would help organisations adapt their own estates, help	Oxfordshire CC CA, Comms	-	Low/no cost	**L/M**	Short-term, on-going	**No Regret (M)**	**M**

No.	Action	Further information and action justification	Relevant stakeholders that could support action implementation	Possible example funder(s)	Funding/ resource secured	Resource Intensity	Time	Type of action	Priority
		communities strengthen their resilience and make it easier for decision-makers to take forward actions. Further information could also be embedded onto other websites that engage with specific audiences, such as provision of advice for local communities and residents.							
			Data, strategy and monitoring						
10.	**Embed and/or support delivery of climate adaptation into a range of co-dependent strategies and plans being produced by council departments/ external partners.**	A list of plans and strategies to which this action applies can be found in Annex 2. Each plan will individually need consideration as to how to best embed adaptation into them. Some of these plans are statutory and can be used as strong drivers for action. Also, adaptation should be embedded into any future iterations of Oxfordshire CC's Climate Action Framework. This is crucial to ensure that decision making is factoring in what impact climate change could have on various future policies. Without this, many of these strategies and action plans may not be fit for purpose.	Numerous council departments and external partners	-	No	**M**	Short-term, on-going	**No Regret (M)**	**VH-I**
11.	Embed climate risks into corporate risk assessments.	This will help to ensure climate risks and adaptation responses are considered in all decisions made by organisations at a strategic level, and that there is a recognition that the current risk level of factors such as flooding and heatwaves are unlikely to reflect the expected frequency and intensity of these events in the future.	All organisations can embed climate risks into corporate risk assessments Central Govt	-	Low/no cost	**L**	Short-term	**Cont. Monitor**	**H**
12.	Develop an approach to capturing data that can help to monitor the impact severe weather events have on the county.	This will help determine the impact of these weather events on people, services and from a financial point of view, allowing for better planning. An analysis of available open-source datasets and, subsequently, a central bank of data sources would be beneficial to allow quantification of weather-related impacts and, over time, climate change impacts to help improve budgeting and assign resource allocation to manage impacts more effectively. Investigate use of the SWIMS tool to make this process easier.	C&RT District councils EA Fire Service LRF Met Office Oxfordshire CC Police SSEN/ Scottish Gas Network TW	-	Low/no cost	**L/M**	Short-term, on-going	**No Regret**	**VH**

No.	Action	Further information and action justification	Relevant stakeholders that could support action implementation	Possible example funder(s)	Funding/ resource secured	Resource Intensity	Time	Type of action	Priority
13.	Map climatological and relevant non-climatological data to inform spatial planning.	Upon identifying, accessing and collating the datasets outlined above, alongside other relevant climate and non-climatic datasets (e.g. demographic and health data), upload spatial datasets into GIS mapping software and establish a central point of access for decision and policymakers to help them inform future projects with climate change impacts in mind. This dataset should be interactive and accessible online.	Oxfordshire CC CA Several partners can help contribute relevant datasets	-	Partially	**L/M**	Short-term, on-going	**No Regret**	**H**
14.	Establish a comprehensive database of local adaptation projects.	These projects should, wholly or in part, focus on climate adaptation in Oxfordshire and the database should be updated at least monthly and owned by the new Working Group (see action 1). It should be shared in a space that is accessible to all members for their input. This would help to ensure a joined-up approach to activities and enabling the sharing of good practice across the area to avoid duplication.	Oxfordshire CC CA Organisations working on climate adaptation projects	-	Low/no cost	**L/M**	Short-term, on-going	**No Regret**	**H**
15.	**Report on progress with delivery of this Route Map and implementation blueprint annually to the FOP and set up a monitoring framework.**	This will ensure actions are kept relevant and are being delivered with success measures identified. One of the first actions that should be undertaken is the development of a monitoring system that goes alongside this Plan to track progress (see recommendations section). A mechanism to celebrate success of actions that have been implemented should also be established alongside the overall monitoring system.	All partners	Defra EA	Low/no cost	**L/M**	On-going	**No Regret**	**VH-I**
Natural Environment and Assets									
Strategy, policy and engagement									
16.	Embed climate adaptation into any natural environment/ natural capital working groups operating county-wide.	This will enable a more joined-up approach to ensure that climate adaptation is considered when implementing projects where enhancing nature is a core objective, either in terms of how a nature-based scheme can contribute to adaptation, and/or to ensure nature-based schemes are resilient to a future climate.	BBOWT District councils EA FC NE OLNP Oxfordshire CC CA, L&NR RSPB	-	Low/no cost	**L**	Short-term	**No Regret**	**H**

No.	Action	Further information and action justification	Relevant stakeholders that could support action implementation	Possible example funder(s)	Funding/ resource secured	Resource Intensity	Time	Type of action	Priority
17.	**Ensure that climate change adaptation forms a key part of the emerging Local Nature Recovery Strategy (LNRS) for Oxfordshire.**	Nature is struggling in no small part due to climate change. It will not recover unless the recovery options consider how nature may fare in a future climate (see action 18). It is a huge opportunity to use LNRSs to allow nature to become a significant part of the adaptation solution, by ensuring that new nature creation/ enhancement programmes help to create a bigger, better, and more joined up natural environment which will be more resilient to the impacts from climate change. Considering the LNRS through this lens will also help to address any conservation-focused actions that may conflict with what is required from an adaptation perspective.	BBOWT EA FC NE NT/HE Oxfordshire CC L&NR RSPB WO	-	Yes	**L**	Short-term	**No Regret (M)**	**VH-I**
18.	Ensure climate change adaptation options prioritise and incentivise the delivery of habitat improvement projects, and embed into future LNRS iterations.	Following publication of the LNRS, delivery of adaptation options should, where possible, aim to accelerate habitat connectivity and nature improvement, and visa-versa. All projects that may be born from the LNRS have the potential to strengthen delivery of both areas to create an environment across Oxfordshire that can help adapt to the pressures of a changing climate. The Landscape Connectedness Under Climate Change in Oxfordshire report highlights which areas could benefit from increased connectivity in a future where climate change has taken hold, and, as such, where action should be accelerated.	BBOWT EA FC NE NT/HE Oxfordshire CC CA, L&NR RSPB WO	Defra NE FC	No	**M**	Medium-term, on-going	**No Regret (M)**	**VH**
19.	Consider how adaptation could be integrated into implementation of BNG requirements.	In addition to focusing on habitat connectivity and quality, additional criteria around how climate adaptation could be integrated into the BNG process, with guidance provided to developers on how to achieve this, could help to strategically provide benefit through (e.g.) NFM approaches. The district councils and Oxfordshire CC could help to encourage this integration.	BBOWT Defra District councils EA NE Oxfordshire CC L&NR	-	Low/no cost	**L**	Short-term	**No Regret (M)**	**H**
20.	Work collaboratively to support National Landscapes (previously AONBs) that cover Oxfordshire with the	National Landscapes are being encouraged by Government to produce adaptation plans by 2028. This new requirement provides an opportunity to strengthen the resilience of some of the most beautiful and sensitive landscapes in the country. The Oxfordshire area includes three National Landscapes and local partners should support the efforts of the National Landscape	BBOWT FC National Landscapes NE NT/HE Oxfordshire CC L&NR	Defra NE	No	**L/M**	Medium-term	**No Regret**	**VH**

No.	Action	Further information and action justification	Relevant stakeholders that could support action implementation	Possible example funder(s)	Funding/ resource secured	Resource Intensity	Time	Type of action	Priority
	development of adaptation plans.	bodies to produce their plans and ensure synergies between other, relevant local priorities (e.g. LNRS) to prevent duplication.	RSPB WO						
Practical nature-based projects to help enhance adaptation									
21.	Ensure local tree planting and biodiversity improvement programmes contribute to climate adaptation objectives.	Most new tree planting schemes have the primary aims of meeting Net Zero targets, or delivering air quality or biodiversity benefits, but by planting the right trees in the right place, all future schemes could also have positive impacts on helping alleviate the impacts of climate change too, e.g. that they help to reduce flood risk, contribute to urban cooling etc. Ensuring that new trees are also likely to be resilient to a future climate is also important. These principles need to also be embedded into the emerging Oxfordshire CC Tree Strategy. Other habitats, such as floodplain grazing marsh, wetlands, fens, hedgerow, species-rich grasslands etc can also bring about significant adaptation benefits and these should be a key consideration in future improvement works.	The myriad of organisations involved in such schemes. Nurseries should also be consulted to ensure demand can be met locally.	FC EA NE Defra	Partially	**L/M**	Short-term, on-going	**No Regret (M)**	**VH**
22.	Produce a Green and Blue Infrastructure Strategy for Oxfordshire.	Building on the green infrastructure investment policymaker summary and Oxfordshire's greenspace-deprived neighbourhoods report, it would be beneficial for Oxfordshire to produce a Green and Blue Infrastructure Strategy to provide a framework for the various existing and planned initiatives and consolidate them into one coordinated strategy that puts climate change, wellbeing and nature at its heart. These initiatives include the Natural Capital in Oxfordshire short report, the forthcoming Tree Strategy and LNRS, district council strategies such as Oxford's Urban Forest Strategy, and existing green/blue infrastructure strategies and projects developed by the district councils, such as Wild Oxford. Ultimately, adaptation to climate change should be one of the key reasons for investing in green infrastructure, as it can help to alleviate flood risk and reduce the urban heat island effect, amongst other things. Other outcomes of such a strategy will include biodiversity, air quality, economic growth and health and wellbeing.	BBOWT C&RT District councils EA FC GWS NE Oxfordshire CC L&NR RSPB WO	Defra EA NE	No	**M**	Long-term	**No Regret**	**VH**

No.	Action	Further information and action justification	Relevant stakeholders that could support action implementation	Possible example funder(s)	Funding/ resource secured	Resource Intensity	Time	Type of action	Priority
23.	Assess the climate resilience of Oxfordshire's parks and green spaces and propose appropriate adaptation options.	Our green spaces have become ever more important in our society, especially since the impact of Covid-19, for both wildlife and people. Ensuring they are fit for a future climate is hugely important and will help to contribute to a range of objectives around biodiversity, alleviation of air pollution and health and wellbeing, the latter of which is discussed in detail in the new Oxfordshire's greenspace-deprived neighbourhoods report. This is especially important, given that green spaces may be used more in future if we get more prolonged dry weather. Adaptation measures should be integrated where appropriate, such as strategic tree planting, water meadows, changing mowing regimes, installing drinking water fountains, planting more drought-resistant species etc, and actions taken shared with other landowners.	District councils Oxfordshire CC L&NR GWS RSPB LCGs EA TW C&RT	Defra NE	No	**M**	Medium-term	**Cont. Monitor**	**H**
24.	Assess locations that may be most prone to outdoor fires and propose appropriate adaptation options.	Some local stakeholders are concerned about the future risk of fire in Oxfordshire due to its rurality. Many fires are started by people, therefore methods of prevention need to be considered, such as providing sites safe for barbecues, managing spaces better to reduce fire risk and provision of signage and guidance at prone sites encouraging users not to exacerbate the risk. Other potential sources of ignition should also be evaluated as part of the fire vulnerability assessment.	BBOWT District councils FC Fire Service Oxfordshire CC L&NR	Defra NE	No	**L/M**	Short-term	**No Regret (M)**	**H**
25.	Ensure Oxfordshire continues to establish a range of Nature Based Solutions and NFM projects to support adaptation objectives.	NFM and nature-based projects can provide multiple benefits alongside climate change adaptation, including biodiversity improvements, carbon sequestration and reducing pollution. Investment in such schemes should continue as the most nature-friendly way of alleviating climate risk, with existing collaborative mechanisms utilised for quicker gains on a greater scale (e.g. catchment partnerships and the Thames Valley Flood Scheme). Setting up a monitoring process to assess the effectiveness of such schemes is also crucial.	All of the partners listed here that in some way look after the natural environment	EA NE Defra	Yes	**M/H**	Short-term, on-going	**No Regret (M)**	**VH**
Assessment, research and monitoring									
26.	**Conduct an analysis of which of Oxfordshire's**	Climate change is likely to affect multiple species in a range of different ways. Oxfordshire would benefit from having greater	BBOWT Defra	Defra NE	No	**M/H**	Short-term	**Cont. Monitor**	**VH-I**

No.	Action	Further information and action justification	Relevant stakeholders that could support action implementation	Possible example funder(s)	Funding/ resource secured	Resource Intensity	Time	Type of action	Priority
	habitats, species and crops could be most affected by climate change, including the negative impacts of new pests, pathogens or Invasive Non-Native Species (INNS).	awareness of which of its habitats and species are most (and least) likely to be at risk of decline or stress under a range of climate scenarios. In addition, pests, pathogens and INNS are more likely to establish themselves due to climate change. Launching local analyses on how these could affect habitats and species in the county would represent a first step to help prepare for this eventuality to protect ecosystems from their most negative consequences, especially high-quality habitats already at risk from climate change, and potentially benefit from opportunities new species may bring. Lessons could also be learned from approaches taken abroad, along with resources produced by NE including their Climate Change Adaptation Manual and Climate Change Vulnerability Model. Following this, more targeted measures could be identified and data from the Forestry Commission's TreeAlert system could be obtained to aid with this.	EA FC NE Oxfordshire CC L&NR RSPB UOx WO	FC					
27.	Set up or utilise existing community-led groups that can routinely monitor the areas identified as potentially being most vulnerable to pests and diseases.	Following the above exercise, utilising community groups and volunteers will encourage local people to help protect their nearby woods and forests, and monitoring on a more routine basis will ensure diseases are picked up early. Again, the TreeAlert system could be used for more systematic logging of observed impacts.	BBOWT Defra District councils EA FC LCGs NE Oxfordshire CC L&NR RSPB TVERC WO	Defra NE FC	No	**L/M**	Medium-term	**No Regret**	**VH**
28.	Monitor the colonisation of new species due to climate change.	Climate change could lead to new species colonies in terrestrial and freshwater environments. While some colonisations may lead to negative impacts, some may benefit the native ecosystems and landscape and boost biodiversity. Analysis and monitoring of such species will allow for better maintenance and a more resilient ecosystem.	BBOWT Defra EA FC LCGs NE Oxfordshire CC L&NR	Defra NE FC	No	**M**	Medium-term	**Cont. Monitor**	**M**

No.	Action	Further information and action justification	Relevant stakeholders that could support action implementation	Possible example funder(s)	Funding/ resource secured	Resource Intensity	Time	Type of action	Priority
			RSPB TVERC WO						
29.	Undertake detailed future scenario modelling of flood (fluvial and surface water) and drought risk in Oxfordshire.	The impact climate change could have on rainfall intensity and frequency could have consequences on the area in terms of both flood and drought risk. Building on the EA's work on integrated water management, undertaking future scenario modelling of water course behaviour and surface water flooding potential against a range of future climate scenarios may help to identify key risks, and locations and sectors that may be most affected. This will help to obtain a clearer picture of future water management practices that may need to take place to reduce both flood and drought impacts, aligned with water usage data and analysis from TW to target areas for intervention alongside their Water Resource Management Plan and existing adaptation activities. It will also help with development and investment decision-making. The EA's NAFRA maps are being updated in 2025 which will aid with this and should be consulted initially to determine what is covered.	EA Oxfordshire CC Flood risk Technical consultancies TW	EA	Planned	**M**	Short-term, on-going	**Cont. Monitor**	**VH**
Infrastructure									
Engagement and communications									
30.	Embed climate change adaptation into existing infrastructure forums.	One of the biggest challenges and complexities with regards to climate change risk is that of cascading failures, i.e. if one piece of infrastructure fails due to an extreme weather event, this could result in a 'domino effect' of failures on other infrastructure which, in turn, leads to negative effects on businesses and the community (e.g. loss of power, closure of roads etc.). More active dialogue needs to take place between key infrastructure providers to ensure solutions are being proposed that consider the way climate risks interact and interlink for the benefit of Oxfordshire and beyond. Existing infrastructure forums should be	DESNZ DfT EA All major infrastructure companies in power, transport, communications etc and relevant council departments	Central Govt	No	**L/M**	Short-term, on-going	**No Regret**	**VH**

No.	Action	Further information and action justification	Relevant stakeholders that could support action implementation	Possible example funder(s)	Funding/ resource secured	Resource Intensity	Time	Type of action	Priority
		utilised and adaptation integrated as a key theme, acting as a conduit of global good practice solutions, and ensure that stakeholder responsibilities for infrastructure improvement and maintenance are well-defined and transparent.							
Highways and travel									
31.	Undertake an assessment/ mapping exercise of local roads, cycle paths, pavements, electric vehicle charging points and car parks to determine which are most likely to be at risk from failing/ reduced performance in future climatic conditions.	National Highways have produced a climate change adaptation plan, but this only includes the main trunk roads (motorways and major A-roads). Therefore, all other roads and highways assets and car parks in council control need to be assessed for their likely ability to cope in a future climate to ensure connectivity is maintained. This should include priority areas of the Resilient Highways Network alongside those most vulnerable to flood risk, slope failure, drainage pressure/ inundation and damage caused by storms or overheating, coupled with the strategic importance of the asset and popular bus routes. The outcome of this exercise can then inform the resilient network and build on actions already referred to in the Highways Asset Management Plan.	District councils Oxfordshire CC Flood risk, Highways DfT EA NH TW	DfT EA	No	**M/H**	Medium-term	**Cont. Monitor**	**VH**
32.	Utilise telemetry and warning systems to provide alerts and notifications of severe weather related issues on the road/cycle network.	If alerts are set up to operate in locations where the road/cycle network is most relied upon, this could help improve the response and rapidity in which roads can reopen following a severe weather event.	EA Met Office Oxfordshire CC Highways, JORT	-	Low/no cost	**L**	Short-term	**No Regret**	**H**
33.	Identify and prioritise adaptation options on the most popular current and future walking and cycling routes across the county.	There is a need to prioritise and expand walking and cycling opportunities as part of the county's Net Zero commitments, and one way to do this will be to ensure the most used routes (e.g. National Cycle Network Route 5), and potentially important future routes created to fulfil housing demand, are as resilient to climate change impacts as possible, to ensure they are 'reliable' routes for users. Adaptation options include drainage, green infrastructure integration, appropriate surfacing materials and 'cooling stations,' such as water fountains and shaded benches. There is also an opportunity to include adaptation in Local	District councils Living Streets Oxfordshire CC Highways, Transport Policy, L&NR Sustrans	-	No	**M/H**	Medium-term	**Cont. Monitor**	**H**

No.	Action	Further information and action justification	Relevant stakeholders that could support action implementation	Possible example funder(s)	Funding/ resource secured	Resource Intensity	Time	Type of action	Priority
		Walking and Cycling Infrastructure Plans to embed it into project delivery.							
34.	Ensure biodiversity improvements and tree planting programmes are integrated into local highways works.	This action can build on the priorities of the Local Transport and Connectivity Plan. However, for any project where the aim is to improve biodiversity, consideration should be given as to whether the species planted are fit for purpose, and whether cutting and maintenance regimes need to change. An analysis of capacity of those undertaking maintenance regimes should also take place, as innovation may be required above and beyond the more standard mowing/cutting regimes currently in place. There could also be an opportunity to prioritise biodiversity improvements around roads that are most vulnerable to (e.g.) flooding, and whether 'rewilding' such areas can lead to a reduction in climate risk.	District councils Oxfordshire CC Highways, Transport Policy, L&NR	NE EA	Yes	**L**	Short-term	**No Regret (M)**	**H**
35.	Undertake an analysis of all County Council-owned bridges and structures to check their viability in a future climate.	Bridges have been identified as being especially vulnerable to climate change due to their fragile structure and that they often enable connections over water bodies which are likely to flood more often. As part of routine inspection regimes, an assessment of those owned by the County Council (i.e. those outside the jurisdiction of Network Rail, National Highways etc.), alongside an analysis of other critical structures, should be taken to prevent the risk of erosion, failure, damage and subsequent connectivity issues. Adaptation options can them be prioritised depending on the outcomes of this analysis and the strategic importance of the bridge. The approach to this should be joined up with District Council processes so that all similar assets are dealt with consistently.	C&RT DfT District councils EA HE NR Oxfordshire CC Highways	-	No	**M/H**	Medium-term	**Cont. Monitor**	**H**
36.	Ensure new local passenger transport vehicles are fitted with air cooling devices.	Passenger transport use will continue to be a priority to help meet the county's Net Zero targets. There is an opportunity to take advantage of the rollout of new electric/ hydrogen passenger transport vehicles to ensure they are also fitted with air conditioning or equivalent technology, and/or passive cooling measures such as blinds to ensure they are cool in summer, to maintain passenger numbers and reduce adverse health impacts.	Bus operators such as Stagecoach DfT Oxfordshire CC Transport Policy	Bus operators DfT	No	**M/H**	Medium-term, on-going	**No Regret**	**M**

No.	Action	Further information and action justification	Relevant stakeholders that could support action implementation	Possible example funder(s)	Funding/ resource secured	Resource Intensity	Time	Type of action	Priority
37.	Ensure climate adaptation is integrated into the design and planning for new infrastructure assets and schemes.	These schemes could include new roads, bus shelters, sub-stations, drainage upgrades etc. Consistent integration of climate adaptation (and, where feasible, nature-based) considerations will ensure any new infrastructure will be resilient, preventing damage and saving money in the long-term, while keeping the county connected.	All infrastructure providers including councils	-	No	**M**	Short-term, on-going	**Cont. Monitor**	**VH**
38.	Ensure climate adaptation is integrated into future updates to the Local Transport Plan.	To ensure that the Oxfordshire transport network is resilient for the future, consideration should be given as to how future transport planning policies consider climate risks and how adaptation measures, such as some of those outlined above, could be integrated into future transport schemes. Adaptation could be embedded into existing policies (e.g. healthy place shaping) or be included as a standalone policy.	DfT NH Oxfordshire CC Transport Policy, Highways, CA Sustrans	DfT	No	**L/M**	Medium-term	**No Regret (M)**	**VH**
			Water and waste management						
39.	Continue the rollout of strategic flood management schemes and identification of areas suitable for alternative flood resilience measures.	Flood risk is increasing and will continue to do so and some areas of Oxfordshire will be impacted more often by severe flooding in the future. Work to identify where existing interventions will largely prevent flooding versus those areas where flooding is still likely to occur should take place, alongside the embedment of potential future flood risk when planning any new strategic defence schemes. In areas that will not benefit from these, areas should be prioritised for alternative flood resilience measures (e.g. property/site-level residential or commercial measures, nature-based solutions etc.).	EA LRF NFF Oxfordshire CC Flood Risk, JORT	EA Defra	Partially	**H**	Long-term, on-going	**Cont. Monitor**	**VH**
40.	Work collaboratively to accelerate rollout of existing water saving programmes and campaigns.	Water supply will become more constrained in future because of drier summers and an increasing population. If all residents, public sector bodies and businesses saved a small quantity of water each year it could result in a significant cumulative saving, reducing pressure on water supplies. It will also help support existing resilience plans and water saving strategies being implemented by TW, alongside the objective to work with public sector bodies to identify leaks throughout their building stock. To do this, TW and the local councils should work in partnership to target areas of high water usage to raise awareness of simple,	District councils Housing Associations Oxfordshire CC PH TW and other water companies that cover parts of the county	-	Yes	**L/M**	Short-term	**No Regret**	**H**

No.	Action	Further information and action justification	Relevant stakeholders that could support action implementation	Possible example funder(s)	Funding/ resource secured	Resource Intensity	Time	Type of action	Priority
		cost-effective measures that all residents and employees can take to reduce their water usage. This messaging can be expanded to all households and businesses regardless of their location. Lessons on how to achieve this effectively can be learnt from existing/ historic campaigns (e.g. on energy efficiency).							
41.	Analyse how climate change could impact on the local waste collection and disposal service.	This is one of the most valued and public-facing services that councils operate and ensuring that they are robust and able to withstand a future climate will be paramount to service continuity and reputation. To do this, a review of the impact of a variety of recent extreme weather events (heatwave 2022, flooding 2024 etc.) on the waste collection and disposal services should take place initially, to help proactively plan for what may be required to deal with more frequent such events in future, including staff health risk assessments, mapping of prone areas to (e.g.) flooding, quantification of impact on service delivery etc. Other actions within this Plan, such as provision of advice to residents on managing extreme weather impacts, will also assist with this.	District councils Oxfordshire CC Waste Management Waste collection companies	-	No	**L/M**	Short-term	**No Regret (M)**	**H**
42.	Ensure waste management practices, storage and treatment facilities are robust to withstand future climatic conditions.	Landfill, incineration and waste handling, treatment and recycling operations need to be resilient to climate change and extreme weather events, and specifically assess the risk of pollution incidents from flooding. Without this consideration, there could be significant public health and environmental consequences if (e.g.) untreated sewage is released. Moreover, new waste and other activities subject to environmental permitting (such as minerals, agriculture and chemical plants) need to undertake a climate change risk assessment if active for five years or more, according to EA guidance.	Defra EA Oxfordshire CC Waste Management Technical consultancies Waste contractors/ operators Wrap	Waste contractors EA Defra	No	**M/H**	Medium-term	**Cont. Monitor**	**H**
43.	Ensure all other sectors and businesses which require environmental permits assess the potential impacts of	As with waste management sites above, it is important that climate risk assessments are thoroughly conducted, and adaptation options considered, on all sites where environmental permits are required (such as for activities involving potentially harmful substances, cement works, petrol stations etc), given the	Defra District Councils EA Oxfordshire CC Relevant operators	EA Defra	No	**M**	Medium-term	**No Regret**	**H**

No.	Action	Further information and action justification	Relevant stakeholders that could support action implementation	Possible example funder(s)	Funding/ resource secured	Resource Intensity	Time	Type of action	Priority
	climate change on their operations.	disruption of operations and potentially harmful impacts these sites could have on the surrounding area (e.g. contamination of flood water). The EA should support operators to assess their risks accordingly.	Technical consultancies						
44.	Conduct a climate change assessment of minerals extraction processes.	Minerals extraction, a practice which is also subject to environmental permits, frequently involves water abstraction and, therefore, should be subject to consideration for climate adaptation given pressures on water availability in the environment. Operations could be disrupted if future climate scenarios are not borne in mind. The restoration of mineral sites also offers wide ranging climate adaptation opportunities including flood alleviation, water resources and green infrastructure.	Defra Landowners/ NFU Oxfordshire CC Minerals & Waste Relevant operators Technical consultancies Wildlife and environmental organisations	EA Defra Industry	No	**M**	Medium-term	**Cont. Monitor**	**H**
Health, Communities and the Built Environment									
Health and Social Care									
45.	**Identify and appraise climate adaptation options for the most vulnerable health and care assets.**	Such locations accommodate some of the county's most vulnerable people, especially if they are elderly and have underlying physical or mental health conditions. In particular, all such assets are likely to overheat more often in future if they have not been constructed with climate change in mind, meaning that there is a greater likelihood of mortality and extreme discomfort as a consequence of extreme heatwave conditions. Therefore, building on the Director of Public Health's Climate Change report which helps to identify the most vulnerable health and care settings at risk from climate change, each of these assets should be audited for the most appropriate adaptation options most appropriate on a site by site basis. Oxfordshire CC's adaptation planning audits for schools could be utilised and tailored to achieve this, and the EA are also producing a piece on climate transition which will look at doctors, nurseries, care homes etc.	BOB ICB BRE EA OACP and other health bodies OHFT OHU Oxfordshire CC PH, social care Technical consultancies UKHSA	DHSC UKHSA NHS England	No	**H**	Medium-term	**Cont. Monitor**	**VH-I**

No.	Action	Further information and action justification	Relevant stakeholders that could support action implementation	Possible example funder(s)	Funding/ resource secured	Resource Intensity	Time	Type of action	Priority
46.	**Produce an adaptation plan for the NHS Integrated Care System and Trusts that cover Oxfordshire.**	The above action can help to identify adaptation options on an asset by asset basis. Armed with this intelligence, an adaptation plan should be produced for the healthcare sector in Oxfordshire that sets out and prioritises which assets to adapt first and which options to take forward. The plan should also set out options to address how climate change could affect service delivery and patient care due to increasing extreme heat, flooding, water scarcity and other climate related risks. Use the new Green Plan adaptation guidance on the WeAdapt platform and SWM's Adapt to Survive toolkit to assist with this.	BOB ICB NHS England OHFT OHU Oxfordshire CC PH SWM	DHSC UKHSA NHS England	No	**L/M**	Short-term	**No Regret**	**VH-I**
47.	Annually raise awareness and disseminate the Adverse Weather and Health Plan, and the Oxfordshire Heat Health Action Plan to health and care settings.	Alongside the above, implementing this is a quick win action; the documents already exist and should be used by all healthcare workers in the county when a heatwave occurs to ensure staff and residents are as protected as possible. The Heat Health Plan can also be reviewed as part of this process, to ensure it is reflective of new threats that climate change may bring.	BOB ICB NHS England OACP OHFT OHU Oxfordshire CC PH UKHSA	-	Low/no cost	**L**	Short-term	**No Regret**	**M**
48.	**Provide adaptation training for health and social care delivery professionals and senior leaders.**	As the previous actions show, the health and social care sector needs to adapt to the increasing threats from a changing climate. Buy-in and understanding can be achieved through capacity building training, explaining what adaptation means, its relevance to the NHS and what can be done at the Trust/ICB level by way of implementation.	BOB ICB NHS England OACP OHFT OUH Oxfordshire CC PH SWM/Sniffer	DHSC UKHSA NHS	Partially	**L/M**	Short-term	**No Regret (M)**	**VH-I**
49.	Ensure that climate risks are addressed and considered in the commissioning and provision of all new health and social care services and assets.	The impacts of climate change will affect the vulnerable in society the most, so it is critical that climate risk planning is embedded into all aspects of the social care system and that people who need greater support during heatwaves, flood events etc are provided with it. The NPPF and other local planning policies should be referred to for details on what to consider for new developments and climate change.	DHSC District Councils GPs/ other healthcare providers NHS England Oxfordshire CC PH UKHSA	UKHSA	No	**M**	Short-term	**Cont. Monitor**	**VH**

No.	Action	Further information and action justification	Relevant stakeholders that could support action implementation	Possible example funder(s)	Funding/ resource secured	Resource Intensity	Time	Type of action	Priority
50.	**Ensure climate risks to health, buildings and infrastructure that affect health and care settings are embedded into corporate risk / business continuity plans.**	Embedment into these plans, which all care settings are already required to produce, will ensure such risks can be considered more routinely and discussed and monitored by risk professionals within the heart of the health and social care sector.	GPs LHRF OHFT OHU Other health and care providers UKHSA	-	Low/no cost	**L**	Short-term	**No Regret (M)**	**VH-I**
Communities and engagement									
51.	Review, support and strengthen early warning systems and communications of weather thresholds in light of climate change.	The Met Office already provides an early warning system when severe weather events are due to take place. However, as a result of climate change, a review should be undertaken around the communication of warnings to the most vulnerable communities, households, businesses, and other organisations and identify areas for strengthening or additional communication channels, as technology and media rapidly develop. Lessons could be learned from early warning systems that were developed during the Covid-19 pandemic, as to whether they could be suitable to tailor to extreme weather.	District councils EA LRF Met Office Oxfordshire CC CA, JORT	-	Low/no cost	**L**	Short-term	**No Regret**	**H**
52.	**Expand on the Oxfordshire Way, existing work and relationships to empower vulnerable communities to develop climate change adaptation and/or community emergency plans.**	Communities in Oxfordshire could increasingly struggle to cope in the event of an extreme weather incident; this could be due to the demographic of the residents, their rural isolation or being in (e.g.) a flood risk area. Such communities will need better protection and support to prevent issues such as displacement or health implications. Oxfordshire CC has mapped where the most vulnerable communities to climate change may be located, and have already established Flood Groups across the county, alongside developing tools such as the Local Climate Action Toolkit. These areas should be targeted as initial pilots for developing climate adaptation plans that expand beyond flood risk, with the process then being rolled out to other communities that would benefit most from having a plan in place. Delivery of capacity building training with these communities, using existing	District councils EA LCGs LRF/ Fire Service NFF OALC Oxfordshire CC JORT, CA, Flood Risk Parish councils TW	EA Defra MHCLG NLCF	Partially	**M**	Short-term, on-going	**No Regret (M)**	**VH-I**

No.	Action	Further information and action justification	Relevant stakeholders that could support action implementation	Possible example funder(s)	Funding/ resource secured	Resource Intensity	Time	Type of action	Priority
		and well-established networks, may need to be commissioned first (which could be linked to the below).							
53.	Develop a consistent approach to supporting parish and town councils with adaptation planning.	Parish and town councils can be supported to develop adaptation plans in the form of: • Climate change adaptation training provided by a third party that can be promoted by OALC. • Development of a simple and consistent template plan, alongside support to the parishes to help them complete it. • Practical examples of small-scale projects that can help with local climate-related issues. • Where development of an adaptation plan is not possible, severe weather resilience should be integrated into Parish Council neighbourhood and emergency plans.	District councils LCGs OALC Oxfordshire CC CA Parish councils	-	Planned	**L/M**	Medium-term	**No Regret**	**VH**
54.	Continue utilising existing funds and explore new ways of funding community resilience projects.	Some funding sources have already been utilised to support community groups with enhancing their resilience to climate change; these have included grants from the Oxfordshire CC Flood Risk team and Scottish and Southern Electricity Networks. Further flexible funding opportunities should be explored, which could be linked to county and district council social value policies, to support communities vulnerable to climate impact exposure, combined with demographic characteristics.	District councils Fire Service LCGs LRF Oxfordshire CC CA, Flood Risk	Defra EA	Partially	**M/H**	Short-term, on-going	**No Regret**	**VH**
55.	Promote and expand on existing measures that promote building household resilience to climate change.	Oxfordshire's Flood Toolkit is a really helpful way of providing proactive and reactive assistance to the impacts of flooding. Expanding this to include other extreme weather events will enable householders and communities to be better prepared for a greater frequency and intensity of extreme weather events and reduce strain on local emergency services and health centres. Framing in a way that can empower householders and communities to take pride in their local area could also further encourage action (linking with action 8). The Better Housing Better Health Programme (which provides advice on overheating) and the Climate Action Oxfordshire websites can also be built upon to include advice on adaptation options and actions that can be taken during extreme weather events. Advice and	District councils Fire Service Housing Associations LCGs Oxfordshire CC JORT, Flood Risk Parish councils SHAP	MHCLG EA NLCF	No	**M/H**	Medium-term	**No Regret (M)**	**H**

No.	Action	Further information and action justification	Relevant stakeholders that could support action implementation	Possible example funder(s)	Funding/ resource secured	Resource Intensity	Time	Type of action	Priority
		resilience bags should be provided to homes, prioritising vulnerable households, so that they can respond quicker in the event of extreme weather.							
56.	Research effectiveness of 'cool spaces.'	Cool spaces (indoor or outdoor) could be where people go during hot summer weather to cool off, especially if their home is prone to overheating, they are homeless, or they have an underlying health condition that could make them more at risk of complications. This will help to reduce the risk of heat-related health issues occurring and reduce the pressure on hospitals and other healthcare settings. Other authorities (e.g. Greater London Authority) have established a cool spaces map, and engagement with them and others should take place to identify their effectiveness and impact, along with analysis of the effectiveness of local existing 'warm spaces' programmes. Engagement with potential owners of cool spaces, such as Church of England, can also take place to determine level of appetite to be involved.	BOB ICB District councils Housing Associations LCGs Oxfordshire CC CA, PH Parish councils	UKHSA NHS	No	**M**	Short-term	**No Regret**	**H**
Planning, retrofit and design									
57.	**Produce new county-wide climate change adaptation guidance for developers.**	Guidance on how to ensure new developments integrate climate adaptation measures should encourage developers to design new homes and commercial premises in a particular way and will assist with the objective that all new residential and commercial developments consider their longevity and performance in a future climate (e.g. through solar gain, ventilation, rainwater harvesting, avoiding non-permeable driveways etc.). Developers should be signposted to and adhere to the guidance for all new developments, via a robust procurement and monitoring process. A guide developed across the whole county through collaboration between the district councils would help with consistency of messaging, sharing of resources and assist with integration into the next round of Local Plans. (see action 60).	Developers District councils EA Oxfordshire CC Property Services	EA MHCLG DB&T	No	**L/M**	Medium-term, on-going	**Cont. Monitor**	**VH-I**
58.	Investigate the viability of a monitoring process to determine if resilient	At present, even if new developments are said to be constructed to a standard that is highly resilient to climate change (and/or to a very efficient and carbon neutral standard), there is no process in place to monitor their effectiveness over time, e.g. does the	Developers District councils	EA MHCLG	No	**M**	Medium-term, on-going	**No Regret**	**H**

No.	Action	Further information and action justification	Relevant stakeholders that could support action implementation	Possible example funder(s)	Funding/ resource secured	Resource Intensity	Time	Type of action	Priority
	building standards are upheld.	building overheat? Are the Sustainable Urban Drainage Systems (SUDS) effective and well-maintained? Are driveways and paving areas permeable? Consideration should be given to whether an appropriate and non-intrusive monitoring system could be put in place to determine the effectiveness of development resilience over time.	EA MHCLG						
59.	Confirm what additional measures could further integrate climate adaptation into emerging Local Plans.	It is crucial that new developments are resilient to a changing climate. Building this principle into the next round of Local Plans, while linking with nature, health and economic outcomes, for each district of Oxfordshire as a core principle from the start is paramount so that this vision can become a realistic prospect. Use the principles of the new guidance (action 57) to support this and produce a checklist that allows councils to identify how it can and has been embedded into local plan development.	District councils EA Oxfordshire CC CA	MHCLG	No	**M**	Short-term	**Cont. Monitor**	**VH**
60.	Integrate the consideration of adaptation options into Net Zero retrofit programmes.	Retrofitting existing homes and buildings is always a challenge but is necessary if we are to achieve our Net Zero ambitions. Adaptation measures should be embedded into existing domestic or corporate retrofit programmes as homes and buildings will become increasingly unable to deal with future climatic conditions as they age, leading to health, displacement and financial issues for occupants. This could include measures such as water efficiency, shading options, better ventilation to reduce overheating risk and to improve indoor air quality, etc, with a monitoring checklist produced to ensure integration has been successful. Oxfordshire CC can use its adaptation planning approach for schools and apply this to its other buildings during the retrofitting process, as well as consult the new planning guidance (action 57) should this be produced.	BRE Developers District councils GSENZH Housing Associations Oxfordshire CC CA, Property Services	EA MHCLG	Partially	**M/H**	Medium-term	**Cont. Monitor**	**VH**
Assessment, research and monitoring									
61.	Produce adaptation plans for the emergency services.	Emergency responders have to deal with the impacts of extreme weather events, be it flooding, fires or extremes of temperature. Should these incidents continue to increase in number and severity, further pressure will be felt by these organisations and business-as-usual may be difficult to maintain. Developing a	District councils EA Fire Service LRF Oxfordshire CC CA, JORT	-	No	**L/M**	Short-term	**No Regret**	**VH**

No.	Action	Further information and action justification	Relevant stakeholders that could support action implementation	Possible example funder(s)	Funding/ resource secured	Resource Intensity	Time	Type of action	Priority
		tested plan with a range of options to acknowledge and address this issue should be the starting point.	SCAS TV Police						
62.	Continue the schools adaptation plan programme, and expand to other public buildings and assets.	Oxfordshire CC are working with consultancy Arup to develop adaptation plans for schools. This approach should continue, with three additional considerations. First, Oxfordshire CC could build on the Director of Public Health's Climate Change report to prioritise which schools to develop a plan for first. Second, funding options should be sought to help the schools implement the adaptation options identified. Third, as mentioned in other actions in this plan, this approach should be rolled out to other public buildings and assets where appropriate, including those not in direct Oxfordshire CC control (e.g. academies, libraries, district council premises etc) via collaboration and Oxfordshire CC's role as a coordinating body; this could be established as a service provided by Oxfordshire CC to local organisations.	Academy Trusts BRE DfE Oxfordshire CC Education, Property Services Technical consultancies	DfE Defra	Partially	**M**	On-going	**No Regret (M)**	**H**
63.	Conduct a climate risk assessment of Oxfordshire's heritage assets and propose adaptation options for those most at risk.	Oxfordshire is home to many significant heritage assets, bringing economic and environmental benefits to the area. Given their historic sensitivity and often remote locations, many of these properties and landscapes are likely to be at high risk of the impacts of climate change. A first step will be to develop a framework for assessment and prioritisation of assets given their quantity. Following this, identifying priorities based on current and future risk can take place to target adaptation options, building on work the National Trust has already carried out. The process could be aligned with Historic England's approach to adaptation under their ARP requirement.	District Councils FC HE NE NT Oxfordshire CC Archaeology, L&NR	NLHF Defra NE	Partially	**M**	Medium-term	**Cont. Monitor**	**H**
64.	Monitor changes to vector-borne diseases as a result of climate change.	Vector-borne diseases from insects such as ticks and mosquitos are likely to increase due to climate change. These can cause serious diseases in humans and need to be monitored closely over time to provide more accurate advice on where and when the likely hotspots in the county will be, and what to do if affected. With this intelligence to hand, a vector management, communication and training plan can be developed with local responders.	Defra DHSC NE NHS England Oxfordshire CC PH UKHSA	UKHSA Defra	No	**M**	Medium-term, on-going	**Cont. Monitor**	**H**

No.	Action	Further information and action justification	Relevant stakeholders that could support action implementation	Possible example funder(s)	Funding/ resource secured	Resource Intensity	Time	Type of action	Priority
65.	Conduct an assessment into how climate change could affect pollution levels in Oxfordshire.	Extreme heat could lead to (e.g.) worsening air quality due to more static meteorological conditions, more extensive flooding could lead to greater incidents of water pollution and more incidents of noise complaints due to increased ventilation of properties (open windows) and increased use of outdoor spaces (property gardens, parks, etc). These trends need to be analysed so that organisations can build this into continuity planning and existing strategies, such as the Air Quality Strategy.	District councils EA OBU Oxfordshire CC Highways, Flood Risk, PH TW UKHSA UOx	Defra EA	No	**M**	Medium-term	**Cont. Monitor**	**H**
66.	Monitor the impact of food safety and security as a result of climate change.	This has been identified as a key risk in the UK CCRA, and it is as yet unclear what activity on this is taking place nationally. Oxfordshire can utilise the principles of its Food Strategy to ensure work is going on to ensure a safe and secure food supply, by working with the agriculture industry, as climate change could affect supply chains and the viability of certain products.	Defra District councils FSA Good Food Oxfordshire Logistics industries NFU Oxfordshire CC PH, Trading Standards	FSA Defra	No	**M**	Medium-term	**Cont. Monitor**	**M**
67.	Conduct an assessment around how climate change could affect the distribution and quantity of pest outbreaks in the county.	For example, could more heatwave conditions lead to an increase in the prevalence of rats and mice due to the impact heat can have on waste disposal, or could warmer winters allow pests to thrive when they would not otherwise have done so? Identifying possible changes will enable businesses and landowners to adapt over time as they can align more resource to specific future trends.	Defra Landowners Oxfordshire CC Trading Standards	Defra	No	**M**	Medium-term	**Cont. Monitor**	**M**
Business and Industry, including Agriculture									
Business resilience									
68.	Build on business resilience engagement programmes and integrate climate change adaptation.	Such engagement, combined with more general business continuity planning and sharing good practice, will enable businesses (especially SMEs) to protect themselves from losses and supply chain disruption due to future weather shocks caused by more flooding, water scarcity and overheating by planning and	BITC Chamber Fire Service FSB LEP	DB&T DLUHC EA GHO/ LEP	Yes	**L/M**	Short-term	**No Regret (M)**	**VH**

No.	Action	Further information and action justification	Relevant stakeholders that could support action implementation	Possible example funder(s)	Funding/ resource secured	Resource Intensity	Time	Type of action	Priority
		implementing adaptation actions. Build on the Code Red project to take such engagement forward, and focus on providing the tools to enable businesses to adapt their own sites to climate risks. The Oxfordshire CC Procurement team are also embarking on business engagement programmes. The Weathering the Storm guidance from SWM and the EA can also assist with this action.	Oxfordshire CC Econ Dev, JORT, Procurement SWM TW						
69.	Launch a funded programme of adaptation planning and support for businesses.	Most businesses, especially SMEs, do not have the time, resource or knowledge to focus on identifying and implementing adaptation options most suitable for their circumstances. A funded programme offering a step-by-step process of auditing, assessing, identification and implementation should be set up to improve business resilience and strengthen the local economy. This could be part of the above engagement process, and options discussed could include flood barriers and raised electrical systems, green and blue infrastructure measures, cooling system installation, etc. Ensure this programme also covers businesses in the agriculture sector. The Shared Prosperity Fund (SPF) could be suitable for this, through integration with wider business support programmes.	BITC Chamber EA FSB LEP NFF Oxfordshire CC Econ Dev	EA LEP Oxfordshire CC	No	**H**	Medium-term	**Cont. Monitor**	**H**
70.	Provide advice and guidance to businesses on how to operate in heatwave conditions.	As summers become hotter, more business premises will overheat and it may become difficult for workers to concentrate and potentially lead to negative health impacts, leading to reduced productivity. This is especially true for businesses that require manual labour and outdoor working. Businesses need to manage workplace overheating and be flexible during such conditions, but also provide advice so that employees can keep themselves as cool as possible.	BITC Chamber DB&T FSB GHO/ LEP HSE Oxfordshire CC PH UKHSA	DB&T UKHSA GHO/ LEP	Low/no cost	**L**	Short-term	**No Regret**	**H**
71.	Ensure as many businesses as possible sign up to the EA flood warnings service.	This will allow businesses, especially those in flood vulnerable areas, to prepare more effectively for flooding when it is likely to occur, minimising the potential costs as a result. This could be supported by the Code Red project (action 68).	BITC Chamber EA FSB LEP	-	Low/no cost	**L**	Short-term	**No Regret**	**H**

No.	Action	Further information and action justification	Relevant stakeholders that could support action implementation	Possible example funder(s)	Funding/ resource secured	Resource Intensity	Time	Type of action	Priority
			Oxfordshire CC JORT, Econ Dev SWM						
72.	Promote and encourage uptake of ISO 14090:2019	This approach would give businesses a framework and incentive for action and provide the opportunity for businesses to share learning and progress with each other on adaptation. Ultimately, it would result in a greater number of businesses more prepared for climate change impacts. Promotion of this should be incorporated into the engagement and Code Red programmes (action 68).	BITC Chamber FSB GHO LEP Oxfordshire CC Econ Dev	DB&T GHO/ LEP	Low/no cost	**L/M**	Short-term	**No Regret**	**H**
Economic growth									
73.	Explore adaptation options and integrate actions into town centre regeneration and brownfield re-development programmes.	Regeneration projects have the potential to represent exemplar 'resilient communities' by implementing adaptation measures, meaning that they can grow and thrive for decades to come. Measures could include natural flood alleviation, SUDS and greening initiatives that benefit climate adaptation, and ensuring all new builds contain rigorous climate resilient standards. This will be achieved by strong planning policies and obligations on landowners and developers. Where brownfield sites are not suitable for development, consider appropriate site greening options (urban forests, parks, wetlands etc).	BBOWT District Councils EA LEP NE Oxfordshire CC Econ Dev Technical consultancies	LEP	No	**H**	Long-term	**Cont. Monitor**	**H**
74.	Embed climate adaptation into new investments and projects designed to boost economic growth.	Future investment needs to be resilient to a changing climate, otherwise new projects could fail before they begin. Ensuring that investment strategies and projects include adaptation as a core principle will ensure all funded projects are as resilient to a changing climate as they can be.	DB&T Defra EA LEP Oxfordshire CC Econ Dev Technical consultancies	-	No	**L/M**	Short-term, on-going	**Cont. Monitor**	**VH**
75.	Provide funding and acceleration opportunities for SMEs (including farmers) to develop adaptation solutions	There are many programmes that help businesses develop innovations for Net Zero, but few focusing on climate adaptation. Launching a programme on adaptation will have the dual benefits of being able to harness the ideas and innovative solutions of SMEs, farmers and NGOs to the climate crisis, while strengthening the local economy. We learnt from the Covid-19	BITC FSB GSENZH LEP Oxfordshire CC Econ Dev	DB&T Innovate UK	No	**H**	Medium-term	**No Regret**	**H**

No.	Action	Further information and action justification	Relevant stakeholders that could support action implementation	Possible example funder(s)	Funding/ resource secured	Resource Intensity	Time	Type of action	Priority
	(technologies or processes).	pandemic how responsive and flexible SMEs can be; this experience should be utilised.							
76.	Perform an analysis of local climate adaptation skills and services.	We have a strong understanding of where wider Net Zero and environmental skills and services co-exist, but much less of an understanding of this for adaptation. Without this research, and the knowledge and examples in would uncover, it will not be possible to understand where there may be opportunities for growth and development of skillsets to support solutions for the climate crisis.	BITC Chambers DB&T FSB GSENZH LEP OBU Technical consultancies UOx	DB&T Innovate UK	No	**M**	Short-term	**No Regret**	**H**
77.	Embed climate resilience into public sector procurement criteria.	Many public sector bodies are considering Net Zero within their procurement practices, but few consider their supplier's resilience to climate change, and whether they are considering their own resilience to climate related shocks. By doing so, this will help to diversify the SME (and agricultural) supply chain and reduce reliability on potentially vulnerable sources, especially if businesses rely on an international supply chain including areas where climate change is likely to have an even greater impact.	All public sector procurement teams	LEP DLUHC	No	**M**	Medium-term	**No Regret**	**H**
			Agriculture						
78.	Rollout and extensively promote Weathering the Storm for Agriculture.	This document aims to improve land manager resilience to climate change, providing practical actions and solutions. It is a resource designed for use by farmers across the country, including Oxfordshire, and an easy win will be to extensively promote it across farming networks across the area.	NFU Various potential partners could assist with rollout	-	Low/no cost	**L**	Short-term	**No Regret**	**H**
79.	**Establish a climate risk and adaptation engagement programme for farmers and land managers.**	Farming represents a significant proportion of the Oxfordshire landscape (over 70% of Oxfordshire's land as of 2024). Adopting new land management practices to help alleviate flood risk could positively affect many local communities, and the farm itself. Climate change also poses risks to the types of crops we can grow, therefore raising awareness of alternatives or ways to protect existing crops would also be beneficial from a food security and economic perspective. However, at present, there is limited coordinated support on this agenda for farmers, along	BBOWT Catchment partnerships Defra District councils EA Food Alliance NE	Defra EA	No	**M**	Medium-term	**No Regret (M)**	**VH-I**

No.	Action	Further information and action justification	Relevant stakeholders that could support action implementation	Possible example funder(s)	Funding/ resource secured	Resource Intensity	Time	Type of action	Priority
		with how the LNRS, BNG, ELMS and other mechanisms can contribute to adaptation. An engagement programme showing how farmers can effectively adapt both their business activities (e.g. crop types etc.) to climate change and contribute positively to local land management to help will provide a good place to start.	NFU and other farm cluster facilitators Oxfordshire CC CA, Flood Risk TW						
80.	Establish dialogue between farmers and planning and permitting officers to encourage adaptation measures on farms.	It has been noted that some farmers see planning and permitting as a barrier to implementing potentially relevant infrastructure to help them adapt their land, e.g. appropriate infrastructure to be better able to store rainwater to prevent flooding and for use during periods of water scarcity. Given the importance of agriculture to the local economy, and the critical role it plays in maintaining food supply for the UK, it is important that they are made aware of their options, and given flexibility to implement them, to ensure there is a more stable water supply available to them throughout the year, even during periods of water scarcity. This could align with a toolkit currently being produced by OLNP which is looking at the environmental benefits farms can deliver, along with potential funding options.	District councils EA NE NFU OLNP	Defra	Low/no cost	**L/M**	Medium-term	**No Regret**	**VH**
81.	Launch a farm adaptation auditing programme.	With backing/ funding from and engagement with the key actors to enable the above, rollout a programme that provides farms with individual mini adaptation action plans that detail the most cost- and 'climate-effective' measures to install on their farm to improve their resilience to a future climate. Prioritise those farms that have experienced a greater degree of failure in recent years due to extreme weather.	Defra EA Local farming networks NFU Oxfordshire CC CA	Defra	No	**M/H**	Medium/ long-term	**Cont. Monitor**	**VH**
82.	Accelerate local food growing initiatives to build resilience into the food supply chain.	Growing food locally has strong environmental and economic benefits, but can also help to reduce the need for the county to import food from other countries where supply and food safety may be compromised due to the impacts of climate change abroad. Local food initiatives are already a priority of the Oxfordshire Food Strategy but further consideration and research into which types of food may be at risk of supply due to climate	CAG Defra District councils FSA Local businesses and farmers	Defra	Low/no cost	**L**	Short-term, on-going	**No Regret**	**M**

No.	Action	Further information and action justification	Relevant stakeholders that could support action implementation	Possible example funder(s)	Funding/ resource secured	Resource Intensity	Time	Type of action	Priority
		change and, therefore, which may be most beneficial to grow locally should be factored into this.	Local LCGs						

Annex 2: Detailed methodology

This annex outlines the methodology used to compile the Climate Change Adaptation Route Map for Oxfordshire.

Step one: Preliminary research

Upon commencing the project, our first task was to establish a baseline that reflects projects that have already been delivered and how adaptation is being integrated in wider sustainability, nature and Net Zero related activities, to help influence what is referred to in this document, and to identify any existing activity. To do this, we:

- Gained a clear understanding of the Climate Vulnerability Assessment completed by Atkins on behalf of the Future Oxfordshire Partnership, and how it may inform the actions in this Route Map, and their priority status.
- Accessed and read key Council strategies to identify where adaptation is being, or should be, included. These included:
    - Circular economy strategies
    - Community Wealth Building Strategy
    - Council and external Net Zero Plans
    - Emerging Local Nature Recovery Strategy
    - Emerging Oxfordshire rail strategy
    - Health and wellbeing Strategies
    - Highways Maintenance Plans
    - Infrastructure Strategies and Development Plans
    - Local Flood Risk Management Strategy and action plan
    - Schools Capital Investment Strategy.

- Gained an understanding of relevant partnerships for environmental activities that local councils are involved in. This included a particular focus on the Oxfordshire Local Nature Partnership who are one of the project partners supporting Oxfordshire CC with the development of the Local Nature Recovery Strategy, and the Future Oxfordshire Partnership who are delivering a range of activities including a Net Zero Route Map & Action Plan and work on green finance (and by whom this plan has been commissioned).
- Read relevant organisations' latest ARP submission reports and those organisations with a statutory requirement to consider climate change adaptation; links to the most relevant of these are provided below.

ARP-reporting body	Link to latest ARP submission
Cadent Gas	Climate Change Adaptation Report
Environment Agency	Living better with a changing climate
Forestry Commission	Climate change adaptation reporting: Forestry Commission
Historic England/ English Heritage Trust	Climate Change Adaptation Report
National Grid	Climate Change Adaptation Report

ARP-reporting body	Link to latest ARP submission
National Highways	Preparing for climate change on the strategic road network
Natural England	Natural England's climate change adaptation plan
Network Rail	Network Rail Third Adaptation Report
Thames Water	Protecting our water and world
The Wildlife Trusts	Changing nature: a climate adaptation report by The Wildlife Trusts
UK Health Security Agency	Health and care adaptation report

In particular, we were looking to identify any projects already being undertaken that contribute to improving the county's resilience to climate change, or that have the potential to contribute to improving the county's resilience to climate change should they be slightly modified or adapted. This gave us a good base of knowledge to help ensure these projects are reflected and captured in the Plan where appropriate modification, scaling-up and replication could be beneficial.

Step two: Stakeholder engagement

As mentioned above, key to ensuring that this Adaptation Plan is accurate, realistic and fit for purpose was effective and in-depth engagement with stakeholders. As experts on matters in the county, it was critical to speak to those working day-to-day in the area to find out how severe weather and climate change is affecting them.

Identifying stakeholders

We undertook a stakeholder mapping exercise to identify a range of stakeholders from Oxfordshire, which included a series of local and national contacts. The list below outlines who we engaged with and how, with further details forthcoming on the nature of the type of engagement, with explanations given as to what was included in the workshop, 1-2-1 meetings and the survey. In the first column, Oxfordshire CC refers to Oxfordshire County Council, followed by the relevant team/ department.

Organisation engaged with	Route Map workshop	1-2-1 meeting	Survey response
Cherwell Council – Climate Change	Y	Y	
Cherwell Council – Planning	Y	Y	
Community Action Groups (CAG) Oxfordshire	Y		
Environment Agency		Y	
National Farmers Union		Y	
Natural England	Y		
North East Cotswold Farmer Cluster CIC	Y		
Oxfordshire CC – Adult & Social Care		Y	
Oxfordshire CC – Biodiversity	Y	Y	

Organisation engaged with	Route Map workshop	1-2-1 meeting	Survey response
Oxfordshire CC – Business and Intellectual Property Centre	Y		
Oxfordshire CC – Flood Risk Management	Y	Y	
Oxfordshire CC – Highway Maintenance		Y	
Oxfordshire CC – Joint Oxfordshire Resilience Team	Y	Y	
Oxfordshire CC – Landscape/ Green Infrastructure		Y	
Oxfordshire CC – Local Nature Recovery		Y	
Oxfordshire CC – Property Services		Y	
Oxfordshire CC – Public Health	Y	Y	
Oxfordshire CC – Retrofit			Y
Oxfordshire CC – Transport Policy	Y	Y	
Oxford City Council – Climate Change	Y		
Oxford City Council – Planning	Y	Y	
Oxford Health NHS Foundation Trust	Y	Y	
Oxford University Hospitals NHS Foundation Trust	Y		
Oxfordshire Association of Care Providers		Y	
Oxfordshire Association of Local Councils		Y	
Oxfordshire Fire & Rescue Service	Y	Y	
Oxfordshire Local Enterprise Partnership	Y		Y
Oxfordshire Local Nature Partnership	Y		Y
South and Vale Councils – Climate Change	Y		Y
South and Vale Councils – Planning		Y	
Stagecoach West			Y
Thames Valley Local Resilience Forum		Y	
Thames Valley Police	Y		
Thames Water	Y	Y	
University of Oxford	Y		Y
West Oxfordshire Council – Climate Change	Y		
West Oxfordshire Council – Planning		Y	

It should also be noted that many other attendees and organisations attended an initial climate change adaptation capacity building training workshop that we ran in June 2024 (see below).

Stakeholder engagement programme

We wanted to provide a range of ways to engage with the development of this Route Map. As such, we provided a flexible and varied approach to stakeholder engagement that was realistic in the timeframe available, as follows.

Method of engagement	Purpose	Date(s)
Sustainability Leads monthly meeting presentation	• Opportunity to enable to district councils to provide early input to the Route Map, and ask questions about the project	16 May 2024
Capacity building training workshop (online)	• Upskill all stakeholders on what climate change adaptation is, its relevance in Oxfordshire and the latest policy and practice (~80 attendees)	13 June 2024
Route Map development workshop (in person)	• Giving stakeholders an opportunity to shape the content of the Route Map, and comment on the overall vision (~40 attendees)	03 July 2024
1-2-1 online meetings	• Gain a more in depth understanding on how each organisation/ service has been impacted by severe weather in the past few years • Ascertain any existing activity that has taken place to adapt Oxfordshire to climate change impacts	July/ August 2024
Survey	• As above, to gain any further responses from stakeholders who could not be interviewed	July/ August 2024
Environment and Place Portfolio Holders Briefing	• Briefing for Oxfordshire CC elected members on the Route Map, and an opportunity for them to feed in their views on what it should include	25 July 2024

1-2-1 meetings and survey (July/ August 2024)

The purpose of the 1-2-1 meetings was to discuss how severe weather has impacted on those interviewed and the service they are responsible for, and to discuss whether they are considering adapting to climate change, and what actions may have already taken place.

We developed pro-formas for each 1-2-1 meeting so that we could fill in answers to the questions during an online call. We asked similar questions at each meeting, but there were some specific questions that focused on the area of expertise of each stakeholder. The survey, created on Microsoft Forms, mirrored the generic questions that were used at each meeting, and below is a list of questions we asked all stakeholders, and the questions that were presented to those who filled in the survey.

- Can you tell us in broad terms how extreme weather events have impacted your organisation/service over the past few years?

- Do you quantitatively measure the financial/economic impact, or the impact on people/communities, that extreme weather events have on your organisation/service?

- Can you tell us which organisations you have worked with when preparing for, or responding to, the impact of an extreme weather event?
- Has your organisation/service already done anything to improve its resilience to extreme weather impacts?
- What more do you feel your organisation/service needs to do to better respond to the impacts of extreme weather events? What help do you need to do this?
- Is your organisation/service in the process of developing any new strategies/action plans which adapting to climate change could influence, or be influenced by?
- Do you have any other comments?
- Are you happy if SWM and/or the Council keep you informed about the work on climate change adaptation going forwards? Yes or No.

It was the responses to these questions, and the bespoke questions for each stakeholder, that provided the most useful information to inform this Route Map and ensure that it was as accurate and led by stakeholders as possible.

Step three: Development of a Climate Change Risk and Opportunity Assessment for Oxfordshire

In order to develop and validate the risk and opportunity assessment for Oxfordshire, we enlisted the support of Paul Watkiss Associates (PWA). Their assessment took into account the third UK Climate Change Risk Assessment (CCRA3), the Oxfordshire Climate Vulnerability Assessment (CVA) and the stakeholder engagement undertaken.

Risk identification, evaluation and scoring

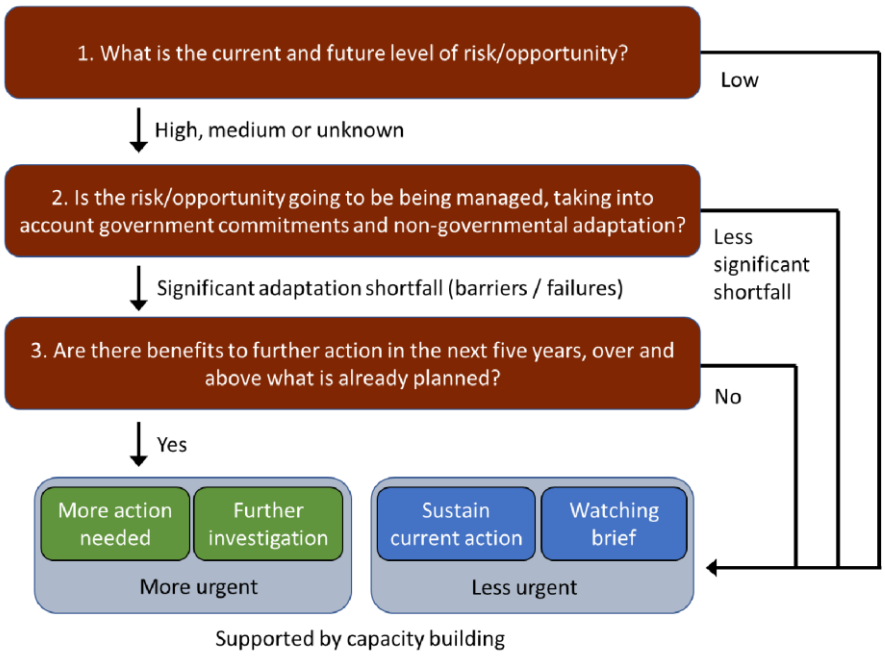
It was agreed that to define the list of risks, the study would use the CCRA3 risks and opportunities unless exceptional circumstances, such as the presence of a new and unplanned risk discovered in the evidence base or interview transcripts which was deemed significant by the study team to warrant inclusion. Furthermore, given the landlocked nature of Oxfordshire, nine risks relating to coastal change, and sea level rise, as well as to marine habitats and species and offshore infrastructure were excluded. This review resulted in a list of 52 risks for the Oxfordshire area, broken down as follows:

Theme	CCRA3 list	Oxfordshire list
Natural Environment	18	13
Infrastructure	13	11
Communities, Health and Built Environment	13	12
Business and Industry	7	6
International	10	10
Total	**61**	**52**

The CCRA3 method prioritises risks and opportunities into differing levels of urgency, based on three key questions:

1. What is the current and future level of risk/opportunity?
2. Is the risk/opportunity going to be managed, considering Government commitments and other non-Government adaptation?
3. Are there benefits to further action in the next five years, over and above what is already planned?

The overall flow chart showing this is outlined below:



The four categories of urgency are as follows:

Category	Description
More action needed	New, stronger or different Government action, whether policies, implementation activities or enabling environment for adaptation, over and above those already planned, are beneficial in the next five years to reduce climate risks or take advantage of opportunities. This will include different responses according to the nature of the risks and the type of adaptation: • Addressing current and near-term risks or opportunities with low and no-regret options (implementing activities or building capacity). • Integrating climate change in near-term decisions with a long lifetime or lock-in. • Early adaptation for decisions with long lead-times or where early planning is needed as part of adaptive management.
Further investigation	On the basis of available information, it is not known if more action is needed or not. More evidence is urgently needed to fill significant gaps or reduce the uncertainty in the current level of understanding in order to assess the need for additional action.
Sustain current action	Current or planned levels of activity are appropriate, but continued implementation of these policies or plans is needed to ensure that the risk or opportunity continues to be managed in the future.

Category	Description
Watching brief	The evidence in these areas should be kept under review, with continuous monitoring of risk levels and adaptation activity (or the potential for opportunities and adaptation) so that further action can be taken if necessary.

The starting point was to assume that the scores for the risks in Oxfordshire would be broadly consistent with the national picture set out in CCRA3 risk list. The study then reviewed the CVA, as well as the 16 interview transcripts. The assumption was that the UK score would be retained for Oxfordshire unless there was significant evidence found for the need to diverge.

It is important to emphasise that such a task is not a replacement for a thorough, comprehensive risk assessment to prioritise actions. However, the method was felt appropriate given:

- The broad consistency of urgency scores over previous CCRA cycles.
- The collective expertise provided through the consortium, including substantial contributions to national and international climate risk assessment, as well as subnational risk assessment within the UK (Glasgow City Region, Edinburgh, Highland, Herefordshire, Rugby, Lincolnshire etc.).
- The existing evidence already developed through work done through the CVA, and planned stakeholder engagement in the Route Map development process.

Findings and justification for risks included

The findings of the work were broadly consistent to that of the overall CCRA3. The review of interview transcripts did not highlight any justifications for variations in overall scores compared to the UK. However, it did highlight a number of areas where stakeholder judgement indicates that whilst the scores themselves may not be different, the adaptation efforts may warrant greater attention. These were notable in three areas:

- Building adaptive capacity in Flood Risk Management (noting the concerns raised in accessing Flood Risk Management funding to deliver schemes).
- Water availability, noting that many issues in the Water Resources Management Plan to manage drought were completely or partially outside the remit of Thames Water and subject to various stakeholder views and perspectives.
- Overheating in healthcare and council estates; there were examples cited of this already being a problem, for example a library constructed in 2016 which regularly reached 45 degrees Centigrade.

Whilst the risk scores did not change substantially through the screening process, it is also important to note that this analysis may mask some potential relative local importance **between** the risks. For example, anecdotally, the interview undertaken with the NHS and OACP highlighted overheating in the NHS and in care homes, and an analysis of overheating in the NHS for 2021/22 highlighted the Southeast region had the second highest numbers of sites overheating. The same analysis also found that Oxford University Hospitals NHS Foundation Trust had the highest number of overheating occurrences within the region. This could suggest that there may be a need. However, the risks to health and social care delivery (H12), and to health and wellbeing from heat (H1) are already scored as more action needed.

A summary of the final scores across the themes of the risk assessments is set out below:

	More urgent		Less urgent	
Theme	**More Action Needed**	**Further Investigation**	**Sustain Current Action**	**Watching Brief**
Infrastructure	5	5	0	1
Natural Environment	9	3	1	0
Communities, Health and Built Environment	7	5	0	0
Business and Industry	2	3	1	0
International	6	0	1	3
Total	**29**	**16**	**3**	**4**

Limitations

Whilst this study has provided an initial set of risks and urgency scores, there were a number of limitations to the approach.

Limitations due to resource constraints and methods

Due to the resources available to conduct this study, one could not consider the wider evidence base when putting together the risk assessment and the compiling each risk's urgency score. For example, the Adaptation Reporting Power reports for infrastructure, or other scientific or policy literature, could have brought about additional evidence that may have influenced the final risk assessment. As such, there was little scope to consider how the risks may vary compared to the national picture provided by CCRA3.

Limitations with the existing evidence base

There were a number of areas where the CVA made it challenging for the study to interpret the relevant urgency scores. These included:

- **Local economic context:** The CVA had limited consideration of the local socio-economic context. For example, agriculture was assessed as a risk but the study did not assess how important it is to the local economy.
- **Consideration of uncertainty:** The assessment's analysis considered the likely level of risk by the 2050s, based on either a pathway to 2 degree or 4 degrees of global warming by 2100. This is consistent with the national level analysis in CCRA3, but can miss important information on uncertainty at the local level.
- **Current and future flood scenarios**: The approach used in the CVA to assess flood risk makes it challenging to understand the potential local risk versus the general national picture. In addition, the study does not outline which of the three CCRA3 flood risk projections were used (see here, page 5) which could affect local future flood risk. Also, the assessment did not account for economic growth and future development in Oxfordshire, which may also increase the level of risk.

- **Assessments of plans and policies:** The CVA assessed both local and national policies together which has made it more challenging to identify the adaptive capacity of the county compared to the national picture.
- **Clustering of risk scores and results**: In the risk scoring process, the CCRA3 risks were scored based on the overall climate related hazard only, rather than also considering the receptor separately. This made it difficult to determine how the receptors may have impacted the risk scores.
- **The scope** of the CVA is narrower than CCRA3 overall and a number of areas of future risks were not included in the analysis. These are shown below:

Chapter	Gap
Infrastructure	Bridges, slopes and embankments for transport, gas pipelines, telecommunications, hydroelectricity, cascading failures, subsidence, water availability
Health, Communities and Built Environment	Energy demand, risks to building fabric
Business and Industry	All major CCRA3 risks were not assessed, e.g. risks from flooding, water availability, access to finance
Natural Environment	Pests, pathogens and invasive species
International	Value chains, migration, food availability, safety and quality, trade, economic losses, public health, international governance

Local studies are often an opportunity to be more specific. For example, work could have looked at what drives economic value and jobs in Oxfordshire and their relative vulnerability to climate risk, which infrastructure is most critical to the area, or which public services (e.g. hospitals) could be most affected.

On the back of the methodology and limitations outlined, PWA have provided some further conclusions and recommendations as part of their accompanying report detailing their approach to the risk and opportunity assessment that has been borne in mind for the development of this Route Map. This report is available upon request.

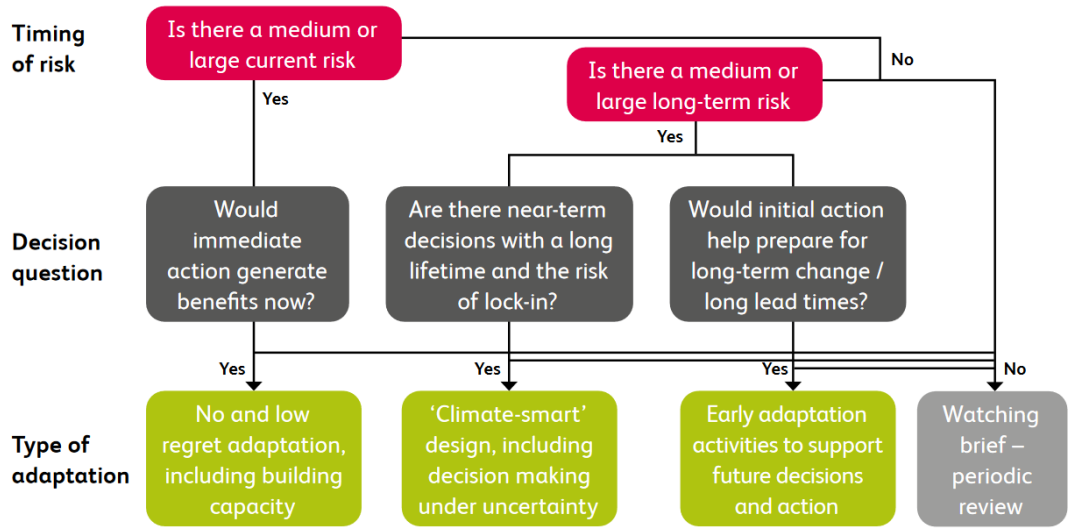
Step four: Identification of Actions

Numerous sources of information and evidence were used to inform the actions included in the adaptation plan detailed in Section 5. These were:

- The risk and opportunity assessment conducted by PWA
- The stakeholder engagement programme
- The literature review
- Good practice from other locations
- Existing work taking place in Oxfordshire
- Our own knowledge on what works

Ultimately, we wanted to ensure at least one action addressed each identified risk and that the plan was structured consistently with the risk assessment, which in itself is consistent with the CCRA3. The actions have been derived using the 'building block approach for adaptation' (first flow chart, based on Watkiss and

Betts 2021) combined with the principles of selecting adaptation options set out in the Local Partnerships Adaptation Toolkit (second tick list).



Effectiveness – will the actions meet your objectives and if so how? ☐	**Legitimacy** – is it politically, ethically and socially acceptable? ☐
Efficiency – do the benefits exceed the costs? If not, how can they? ☐	**Urgency** – how soon could each option be implemented? ☐
Equity – the action should not adversely affect other areas or vulnerable groups ☐	**Costs** – consider social and environmental costs, not just economic ☐
Flexibility – is each option flexible and will it allow for adjustments and incremental implementation? ☐	**Robust** – is each option able to cope with a range of future climate projections? ☐
Sustainability – does each option contribute to sustainability objectives, and are they themselves sustainable? ☐	**Synergies/coherence with other strategic objectives** – does each option help to achieve other objectives? ☐
Practical – can the action be implemented on relevant timescales? ☐	

Many of the actions are 'first step' actions to implementing something bigger, e.g. further research, engagement and integration into strategy and planning. These should then lead to more tangible actions that have a noticeable impact on the ground.

We understand that some of the actions are challenging, potentially resource intensive and require a high degree of effort to implement. Omitting actions on these grounds would, however, go against the reality which is that climate change is happening now, and with a (as of summer 2024) lack of strong policy, guidance and accountability at the national level, action needs to take place rapidly and at scale. This is why we have provided recommended action leads, prioritisation and resource intensity indicators against each one, to help make the plan more digestible.

We have also provided Oxfordshire CC with a spreadsheet and, thus, filterable version of the implementation blueprint, which can be used as a basis for a monitoring system.

-END-