

APPENDIX 3

Adaptation and Nature-Based Solutions Evidence and Options Report

Background

The impacts of climate change are being increasingly felt internationally, nationally and locally. Impacts extend to the health of the natural environment, agricultural and forestry productivity and security of food supply, health and wellbeing, availability and quality of water, increased risk of flooding and resilience of our homes and businesses, and the security and efficiency of our infrastructure and energy supply.

While a growing number of countries – including Scotland – have committed to reduce greenhouse gas emissions to net-zero, further warming is already locked in over the coming decades. It is therefore essential to combine emissions reduction with climate adaptation strategies, to create sustainable places, practices, infrastructure and behaviours and make East Dunbartonshire more resilient to the effects of climate change.

Adapting to climate change includes adapting to present climate and weather and making changes based on future projected changes in the climate. Our response to the challenge of adapting to climate change also intersects with wider social, environmental, and economic priorities as well as our transition to net-zero.

There is clear evidence demonstrating the accelerating pace of warming in recent decades and the impacts we will face should this continue. As we deliver on our net-zero agenda, we must also continue to raise ambitions on adaptation to ensure we are resilient to the challenges of a warming world.

The Climate Change (Scotland) Act 2009 requires the Council to address its resilience and that of its area by contributing to Scotland's Climate Change Adaptation Programme (SCCAP), and to report annually on this. The Programme, prepared by the Scottish Government, sets out and responds to the priority risks for Scotland independently identified by the Climate Change Committee (CCC) in the evidence reports of the UK Climate Change Risk Assessment (UKCCRA) and cover a range of climate change scenarios.

National resources are provided by Adaptation Scotland to support the development of resilience frameworks at the local level, including the Scotland Adapts Handbook and Adaptation Capability Framework. This along with other resources, such as an Adaptation Benchmarking Tool and Climate Ready Places interactive models, provide a basis to identify the 'maturity' of an organisation in terms of addressing adaptation risks, and sets out the four capabilities (set out below) public sector organisations must develop if they are to successfully adapt to climate change. The Adaptation strand of the CAP will develop the maturity level for each of the four capabilities, set out within the Adaptation Capability Framework. CAP adaptation options, delivery actions and projects will be required:

1. To help us better understand the challenge for our organisation and area-wide in terms of the impacts on service delivery and the significant associated costs.
2. To adapt our organisational culture and resources accordingly to raise the awareness and necessity of adaptation as well as an adaptation governance framework.
3. To develop a resilience plan and implementation programme.

4. To ensure collaborative working with key internal and external stakeholders to align our CAP with existing resilience planning.

From a regional perspective, East Dunbartonshire Council is a member of Climate Ready Clyde and Council Officers have worked with the other partners of this initiative to prepare the [Glasgow City Region Adaptation Strategy and Action Plan](#) (launched in June 2021). The Strategy and Action Plan is supported by extensive research and evidence including an Adaptation Risk and Opportunity Assessment, a Theory of Change and substantial economic analysis, which sets out the necessity for adaptation for the city region along with the specific adaptation priorities to achieve this. These priorities are addressed through 11 interventions in the Strategy itself. These interventions include developing the ability of organisations, business and communities to adapt; ensuring everyone's homes, offices, buildings and infrastructure are resilient to future climate impacts; beginning the transition to an economy resilient to future climate impacts, and delivery of nature-based solutions for resilient, blue-green ecosystems, landscapes and neighbourhoods. As the local expression of the regional strategy, the CAP will incorporate proposals to progress each of the interventions at the local level.

The CAP will also be the delivery mechanism for the 16 high-level Flagship Actions contained within the Strategy, including the following:

- New integrated climate warning alert system.
- Communities shaping climate ready places through a place-based approach
- Climate resilient design principles and guidelines.
- Net zero, climate resilient housing retrofit.
- Regional transport resilience.
- Clyde Climate Forest.

One of the main Actions we continue to play a key role in delivering is *Flagship Action 1: Local authorities in the region working together to build capabilities and deliver collaborative adaptation*. A Local Authorities Forum, which has been Co-Chaired by East Dunbartonshire Council since 2021, has been established to progress this Flagship Action. The Forum is already taking forward a number of actions that can support our local adaptation agenda, including considering how to ensure that adaptation is incorporated into development plan policy as effectively as possible and investigating how local authorities can build adaptation into their capital investment decisions. The Forum will also participate in progressing other Flagship Actions contained in the Strategy and Action Plan, which can feed into the CAP, including action to support communities to shape climate-ready places; the development of climate resilient design principles and guidelines; climate finance; and integrating climate resilience into regional supply chains and procurement.

Building Ecological Resilience

Addressing the climate risks to people involves recognising that we are inherently related to and reliant upon the natural environment. Adaptation therefore must also seek to build the resilience of nature and wider ecological systems.

The Dasgupta Review¹ on the Economics of Biodiversity identified that our economy and society have collectively failed to engage with nature sustainably, to the extent that our demands far exceed its capacity to supply us with the goods and services we all rely on. This has neatly been acknowledged in the concept of ‘Doughnut’ economics² – which explicitly recognises the environmental constraints, as well as the need to provide strong social foundations for all. The review recognises that the world is operating far beyond the ecological ceiling in many areas, including climate change. This global overshoot is mirrored at the EU and UK levels. We face twin reinforcing crisis: a decline in biodiversity will exacerbate the climate crisis – and a changing climate will accelerate the rate of biodiversity loss (Scottish Biodiversity Strategy to 2045). The actions we take to adapt and build our own resilience to climate change (e.g. through nature-based solutions) also offer the potential to enhance the natural environment, protecting and building the resilience of vital habitats and ecosystems and our own in a virtuous cycle. This will help ecological systems adjust to the historic consequences of carbon emissions, as we restructure our economy and society to work within them.

The CAP will focus on addressing the climate and ecological emergencies together. An important means of responding to the climate emergency is through the delivery of nature-based solutions. ‘Nature-based solutions’ refers to any action that can be taken to work with nature to resolve social or environmental challenges, providing benefits for both human wellbeing and biodiversity.

Nature-based solutions can help reduce greenhouse gas emissions and provide carbon sinks, capturing and storing carbon from the atmosphere. In terms of climate adaptation, nature-based solutions can help to reduce the adverse impacts of climate change including flooding, moderating heat and enabling migration of species that have been displaced due to climate change via strengthened habitat corridors. An example of nature-based solution would be flood risk alleviation through the naturalisation of watercourses.

In comparison to technology-based solutions to climate change, nature-based solutions are generally more cost-effective, longer lasting, and deliver more co-benefits including:

- Reduced net emissions.
- Expanded carbon sinks through tree planting, and through effective management, restoration and preservation of peatland and carbon rich soil habitats.
- Provision of habitats for biodiversity.
- Benefits to human health and wellbeing.
- Help society and the economy to adapt to climate change.
- Make more resilient and attractive places to live.
- Flood risk alleviation through naturalisation of watercourses.
- Improvements to air quality through tree planting.

¹ The Economics of Biodiversity: The Dasgupta Review (2021): https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/962785/The_Economics_of_Biodiversity_The_Dasgupta_Review_Full_Report.pdf

² Doughnut Economics: Seven Ways to Think Like a 21st-Century Economist (2017)

EDC Governance for Adaptation and Nature-Based Solutions

The Adaptation & Nature-Based Solutions Working Group is the Council's strategic governance approach to improving resilience, identifying Options and Delivery Actions, including nature-based solutions, to adapt to the impacts of a changing climate. The Group works closely with Climate Ready Clyde to implement the principles of the Glasgow City Region Adaptation Strategy & Action Plan at the local level, and with national and regional organisations to develop cross-boundary responses to climate risks. This Group has wide representation from Council Services, including Land Planning & Development, Housing, Assets & Estates Management, Community Planning & Partnerships, Streetscene, Roads Technical & Engineering Support (including Flood Risk Assessment), and HSCP (Health Improvement). Since the end of November 2021, there have been four formal meetings of this group, in addition to communication and feedback to reports at various stages electronically.

This group has been utilised as a sounding board and seek opinions on all adaptation-related options and delivery actions being considered throughout the development of the CAP Options Report and will continue to play that critical role as we progress to developing the draft CAP. The Strategic Environmental Assessment (SEA) will also play a key role in this by assessing all options and reasonable alternatives and provide SEA preferred options to inform the Working Group and decision-making process. It is important to note that the scope of the Adaptation element echoes that of the wider CAP, in that it covers both the resilience of the Council in terms of services and operations as well as resilience throughout East Dunbartonshire, encompassing all communities and businesses.

Overview of Adaptation Progress within East Dunbartonshire

- **Stage 1:** Local Climate Impact Assessment (LCLIP)
- **Stage 2:** Climate Risk and Opportunity Assessment
- **Stage 3:** Options Development

Stage 1: Local Climate Impact Profile (LCLIP)

As a key part of the adaptation evidence base, a Local Climate Change Impact Profile (LCLIP) has been produced. This is a tool designed to help enable Local Authorities understand their level of vulnerability and exposure to climate change in order to effectively prepare and respond to potential future impacts on Council areas. It identifies the specific weather events and trends to quantify the impacts and damage caused at an area-wide level in order to determine how resilient the Council is in relation to their infrastructure and service delivery. This allows Councils to prepare area-wide measures and policies to adapt to and mitigate for the risks posed, as well as harnessing any potential opportunities and co-benefits that may result. This enables the Council to develop and deliver the infrastructure and policy framework required to minimise the worst effects of extreme weather events and safeguard and improve the quality of life of its communities.

The LCLIP was a key part of the evidence base to develop the climate risk and opportunities assessment, demonstrate that extreme weather events are already occurring, outline the impacts experienced and how these may impact East Dunbartonshire in terms of the management and delivery of key services. While an LCLIP provides the baseline data to correlate the frequency and severity of events, it cannot by itself provide evidence of a changing climate. However, it can help establish and highlight the Council's levels of vulnerability and resilience to significant weather events in order to provide recommendations on how services can adapt more effectively.

The LCLIP, in combination with other literature, identified extreme weather events and identified three key trends for weather patterns experienced within East Dunbartonshire. These trends included:

- Milder, wetter winters;
- Warmer, drier summers; and
- More extreme rainfall and severe weather events.

These weather trends have become more apparent over the last few years and are discussed in detail throughout the report using a series of different data maps showing long-term weather trends and changes which are consistent with those outlined, and with the use of case studies. There has been a total of 126 extreme weather events across East Dunbartonshire since 2007, which have had a wide range of impacts in terms of disruption to residents, Council services and project delivery; damage to the environment and infrastructure; and financial implications for the Council. The LCLIP also identified that Council services and operations are particularly vulnerable to multiple types of weather event, but mainly from flooding (pluvial and fluvial) as this accounted for over a third of all extreme events recorded and impacted every service area. During the LCLIP period a number of specific impacts were identified as a result of various types of extreme weather events including:

- Building Damage.
- Transport infrastructure.
- Environmental damage most notably in terms of remediation works. For example, Storm Darwin in 2014 caused significant damage costing approximately £20,000 from fallen trees and landscaping remediation alone.
- Delays to projects and works.
- Disruption due to neighbouring authority weather impacts, mainly through heavy rainfall and flooding upstream.
- Health impacts.
- Changes in lifestyles – mainly through weather events restricting travel options and forcing staff to work from home back when it wasn't a regular occurrence for all service areas, but events also cost a number of lost days of work and service delivery.
- Positive impacts – Some notable examples included an uptake in active travel (during heat events) and increased community awareness and engagement with climate change and the related impacts.

Some services have developed resiliency measures at different rates so therefore the maturity and resilience levels differ significantly. There are also services, predominately front-line services such as Waste who have very little ability to become more resilient due to the nature of their work and lack of ability to work from home for example – which is one of the most common resilience measures for other services. Lastly, every service provided feedback that the lack of funding is the biggest barrier to them successfully building capacity for and implementing future climate resiliency measures.

Stage 2: Climate Risk and Opportunity Assessment

Effective climate risk management requires that the likelihood and consequences of impacts are understood and assessed at the service delivery level within local authorities. The Council's LCLIP was

a step towards identifying potential threats and climate impacts for East Dunbartonshire. To further this process, a high-level analysis of existing climate risks and opportunities for the area was conducted. This risk analysis is based on the known climate trends and existing service responsibilities of the Council. The intention is for this work to be translated through and aligned with corporate and service level risk registers and procedures. This will be vital in identifying and developing appropriate actions for responding to climate risks and delivering opportunities identified. Following guidance in Adaptation Scotland's Capability Framework for a Climate Ready Scotland, risk is determined by a climate change impact's likelihood and level of impact, while opportunities have been assessed on the urgency of action and potential impact from implementation. This information has been pulled together in conjunction with our internal Adaptation and Nature-based Solutions Working Group. The process was finalised and signed off by the Working Group at our August (2022) meeting.

The Council has utilised the robust Glasgow City Region Adaptation Risk and Opportunity Assessment, which was produced to inform the development of the Climate Ready Clyde Climate Change Adaptation Strategy and Action Plan (adopted in June 2021). In addition to this, the UK Climate Risk Assessment 2022 has been used as a key reference document for this area of work.

As set out below, we divided the identified risks and opportunities into specific subject areas and they were also considered under each of the 3 weather trends evidenced from the LCLIP, which ties the two evidence gathering processes together.

Subject Areas	LCLIP Identified Weather Trends
Property Assets and Housing	Warmer, drier summers
Roads and Transport	Milder, wetter winters
Biodiversity Emergency and Natural Environment	Severe weather events and Extreme rainfall
Environmental and Community Health	
Economy and Waste Services	

We then developed a list of criteria to match the methodology and each risk and opportunity were subject to this matrix to illustrate the likelihood and impact of identified risks as well as the urgency of action and potential level of benefits from opportunities. The collaborative assessment with the Working Group members provided an indicative scoring and also highlighted the accountable Council Service Areas and Teams or the primary delivery Service.

The table below sets out the key results but only focusses on the higher-level risks and opportunities identified and breaks them down by Service Area.

Subject Areas	Level of Risk (Likely & Major)	Level of Opportunity (High need and Major benefits)
Property Assets and Housing	10/20	5/6
Roads and Transport	10/17	2/3
Biodiversity Emergency and Natural Environment	5/23	1/2
Environmental and Community Health	6/15	1/2
Economy and Waste Services	2/15	n/a

The report indicates that a significant number of risks are in the higher-priority level. These high-level risks, included:

- Damage to new and existing buildings and infrastructure due to flooding, wind, storm damage and driving rain.
- Increased 'heat island effect' exacerbating unfavourable habitat conditions in urban environments and increased risk of respiratory problems, heat stroke and dehydration particularly for vulnerable groups.
- Reduced ability of vulnerable residents and communities to proactively adapt housing and properties to withstand severe weather events.
- Reduced ability of vulnerable residents and communities to react and recover from severe weather events.
- Increased road, footway and off-road pathways surface deterioration.
- Disruption to work programmes, general maintenance and operational issues caused by waterlogged ground conditions.
- Failure of drainage infrastructure.
- Risks to Council operations from disruption to transport infrastructure, supply chains and distribution networks.
- Degradation of peatland habitats.

The outcomes of the assessment process have clearly highlighted the scale and wide-ranging nature of climate impacts as well as the urgency of action. It is important to note that the content and levels of risk and opportunity are broadly in line with other local authority climate risk assessments that we have reviewed and taken account of as part of our wider research.

Phase 2 Climate Opportunities was a process whereby all the key climate opportunities identified through the Phase 1 Risk and Opportunity Assessment were collated to include the anticipated benefits, urgency of action and scope of influence in terms of internal corporate level or through external partners. This process also led to the creation of specific options and actions to take advantage of identified opportunities and link directly with Stage 3: Options Development (below).

Stage 3: Options Development

The adaptation element of the CAP Options Report required the identification and collaborative development of a suite of Options and Delivery Actions. The adaptation work strand focuses on a range of 22 Options, broken down into associated delivery actions.

Some of the Options and Delivery Actions directly support the delivery of the Interventions and Flagship Actions in the [Glasgow City Region Adaptation Strategy and Action Plan](#). These have been reshaped to be the local expression of the Glasgow City-Region Strategy. Other Options and Delivery Actions for Adaptation and Nature-Based Solutions are more specific to East Dunbartonshire and reflect the local need to adapt and build resilience to the impacts of our changing climate. The links with the CRC Strategy and Action Plan are set out in the table below.

The development process was borne from the evidence already gathered through the LCLIP and Climate Risk and Opportunities Assessment. This provided a foundation allowing us to examine and analyse what Options and course of action could be taken to prepare for and adapt Council Services and behaviours in relation to the specific subject areas and key risks. The identified risks and opportunities along with the associated risk level and urgency of action ratings helped produce a number of different options and proposals to adapt, remediate or mitigate to the associated risk, and the required processes – funding, timescales, Service area, operations etc. - to address and deliver each option.

The draft Options and Delivery Actions for Adaptation and Nature-Based Solutions cover a wide range of information regarding their potential implementation and delivery. There a total of 22 different Options being brought forward which have all been subject to an iterative optioneering process. Each Option has a proposed set of delivery actions; timescales, funding and resources; policy drivers; Council Services/ Teams and key external partners required to deliver the intended outcomes. These have all been developed in conjunction with the A&NBS Working Group. The Options cover a range of themes from both an adaptation and nature-based solutions perspective, and where relevant, mitigation, from flood alleviation to greenspace; planning and transport; ecology and biodiversity; and integrating new processes and operations into Council Services.

Following agreement of the Options and Delivery Actions, these will be further developed and costed in more detail for the Draft Climate Action Plan before being widely consulted upon.

The table below sets out the identified Options and Delivery Actions for Adaptation and Nature-Based Solutions. Additional detail and associated evidence for each of the Options can be found in A&NBS Options Evidence Sheets (**Paper 4 – Adaptation and Nature-Based Solutions Options Evidence Sheets**).

Options	Delivery Actions	CRC Adaptation Strategy and Action Plan (Links to Interventions and Flagship Actions)
ANBS1 - Undertake a Climate Ready Planting feasibility study.	<ol style="list-style-type: none"> 1. Map the opportunities for climate ready planting by habitat type (grassland, wildflowers, trees) 2. Create prioritisation for habitat implementation by habitat type and the co-benefit that would alleviate problem (e.g. surface water management, overheating) 3. Support habitat connectivity through the creation, enhancement and joining of habitat corridors (e.g. pollinator networks) 	<p>Interventions 8.8, 9.1, 9.3, 9.4, 9.5, 9.6</p> <p>Flagship Actions 1, 4, 5, 6, 11</p>
ANBS2 - Increase and improve resilience levels of transport networks and transmission infrastructure.	<ol style="list-style-type: none"> 1. Identification of vulnerable sections of the transport network (road and active travel) frequently affected by weather events (e.g. flooding, road degradation, snow, ice). Transport can be disrupted by severe weather with knock-on effects that interrupt the flows of people and goods throughout the network. The resilience of transport networks, including active travel, can be increased through investing in maintenance, innovative engineering solutions and capital expenditure on improvements. Smart transport networks can improve response and communication. 2. Produce a design brief and resilience hierarchy in relation to the location, design and development of EV charging stations and infrastructure. 3. Use of sustainable materials appropriate for a changing climate when building road / path infrastructure (including carbon accountancy of building materials). 4. Use of permeable surfaces and surface water run-off management adapted to changing climate. Inclusive of existing and new road proposals, and parking. 	<p>Interventions 8.2, 8.3, 8.4, 9.2</p> <p>Flagship Actions 1, 6, 8, 14, 15</p>
ANBS3 - Undertake a SuDS audit and develop an improvement plan.	<ol style="list-style-type: none"> 1. Conduct an audit by type of SuDS feature with ownership details and management of the features. 2. Develop a biodiversity value and habitat networking assessment framework to grade SuDS features on their biodiversity, habitat feature and water pollution characteristics. 3. Prioritise which SuDS features would be of biodiversity value to improve. 4. Develop a SuDS biodiversification implementation and management plan. 	<p>Interventions 7.3, 8.8, 9.4, 9.5</p> <p>Flagship Actions 1, 6, 14</p>

ANBS4 - Proactively identify and deliver wetland habitat creation in the Kelvin Valley.	<ol style="list-style-type: none"> 1. Development of a brief to target biodiversity and habitat connectivity enhancement, water quality improvements and natural flood management opportunities. 2. Desk and site based ecological reviews, river catchment modelling and connectivity mapping exercises 3. Recommendations to implement including costings 	<p>Interventions 6.1, 6.3, 7.3</p> <p>Flagship Actions 1, 6, 11</p>
ANBS5 – Naturalisation and de-culverting of watercourses for biodiversity and flood attenuation.	<ol style="list-style-type: none"> 1. River restoration projects – Glazert, and Kelvin tributaries, including phased plan for biodiversity enhancement. 2. Council guidelines for new developments regarding best practice to be developed so developments are designed around watercourses or with daylighting as part of design. 	<p>Interventions 2.1, 6.1, 6.3, 7.3, 8.3, 8.4</p> <p>Flagship Actions 1, 6, 11</p>
ANBS6 - Undertake a Nature-Based Surface Water Management programme	<ol style="list-style-type: none"> 1. Identify problem areas for surface water management. 2. Identify mix of appropriate nature-based solutions and traffic / engineering solutions. 	<p>Interventions 6.1, 6.3, 7.3, 9.1, 9.4, 9.5</p> <p>Flagship Actions 1, 6</p>
ANBS7 - Development of implementation plan to deliver the Climate Ready Planting feasibility study.	<ol style="list-style-type: none"> 1. In conjunction with the LBAP, develop an implementation plan for recommendations made in climate ready planting feasibility study. 	<p>Interventions 8.8, 9.1, 9.3, 9.4, 9.5, 9.6</p> <p>Flagship Actions 1, 2, 4, 5, 6</p>
ANBS8 - Identification of climate ready parks across East Dunbartonshire.	<ol style="list-style-type: none"> 1. Undertake an area-wide audit of parks and open space capacity for climate adaptation. 2. Deliver the recommendations from the audit. 	<p>Interventions 2.1, 7.3, 9.5, 9.6</p> <p>Flagship Actions 1, 4, 5, 6</p>
ANBS9 - Ensure that the Council has the relevant skills, knowledge and resources to deliver adaptation Options and Delivery Actions.	<ol style="list-style-type: none"> 1. Undertake skills gap analysis in all relevant policy and project delivery services of the Council to ensure delivery of nature-based solutions. 2. Develop and roll-out a programme to upskill existing operational staff. 3. Identify projects with key partner agencies (TCV, HSCP, TFC) 	<p>Interventions 1.1, 1.2, 2.1, 8.3, 8.4, 9.1, 9.5, 9.6, 11.2</p> <p>Flagship Actions 1, 6</p>
ANBS10 - Develop strengthened actions for climate adaptation and biodiversity within LDP3.	<ol style="list-style-type: none"> 1. Creation of brownfield site hierarchy screening checklist for development sites. 2. Development of a fossorial water vole trigger map. 3. Development of guidance on nature networks and green corridors. 4. Develop buffers from key ecological sites (LNR, LNCS) and ecologically sensitive habitats (protected species). 5. Strengthen protection for trees in allocated development sites. 	<p>Interventions 1.1, 2.1, 7.3, 8.3, 8.4, 8.5, 8.6, 8.8, 9.1, 9.2, 9.3, 9.5, 9.6</p> <p>Flagship Actions 1, 6, 7</p>

	<p>6. Development of ecological and climate constraint maps for allocated housing sites.</p> <p>7. Working alongside colleagues in planning to develop an effective post-development monitoring framework to ensure compliance with planning constraints and annual review of projects development. Funding allocated for biodiversity and climate adaptation and mitigation should be ring-fenced.</p> <p>8. Incorporate climate change (adaptation and mitigation) into Developer Contribution policies. Align with ANBS12.</p> <p>9. Development of an adaptation retrofitting framework to promote and develop climate resiliency within existing buildings and developments.</p> <p>10. Develop policy framework to restrict development within flood risk areas and appropriately zone construction proposals to consider flooding (at various scales 1:100 events etc). Align with NPF4 and anchor in a policy approach policy 2 relate to the 6 qualities of successful places. One of the 6 qualities need to be adaptable. Policy 9 relates to homes - requirement to support householder developers where there's adaptation to climate change.</p>	
<p>ANBS11 - Development of the Authority Construction Requirements in alignment with Climate Change and relevant Sustainability Policies.</p>	<p>1. Development of the housing estate should be undertaken in accordance with the ACR and the CAP. Align ACR with existing and emerging building standards regulations.</p>	<p>Interventions 2.1, 7.3, 7.4, 8.3, 8.4, 8.5</p> <p>Flagship Actions 1, 6, 7, 14, 15</p>
<p>ANBS12 - Ensure climate adaptation and building resilience is adequately financed.</p>	<p>1. Investigate the flexibility of the 30-year capital programme - needs to reflect societal changes (the current war in Ukraine, inflation, the cost-of-living emergency and climate change).</p> <p>2. Ring-fencing of budgets allocated for each service for CAP implementation (both mitigation and adaptation). Align with ANBS10: Delivery Action 8.</p> <p>3. Investigate finance mechanisms to deliver climate adaptation.</p> <p>4. Continue to collaborate with Climate Ready Clyde (and Partner organisations) on the development of a City-Region Adaptation Finance Lab.</p>	<p>Interventions 1.1, 2.1, 3.1, 3.3, 3.4, 8.3, 8.4, 8.8, 9.7</p> <p>Flagship Actions 1, 2, 3, 4, 6, 7, 11</p>
<p>ANBS13 - Improve "Best value" process to raise the priority of sustainability and climate change criteria in procurement processes</p>	<p>1. Develop a methodology for climate and biodiversity oversight of decision-making.</p> <p>2. Create a stage in the procurement process for Sustainability Policy Team to be consulted on the carbon and biodiversity costs associated with any major development or high value purchases.</p>	<p>Interventions 1.1, 2.1, 8.8, 11.3</p> <p>Flagship Actions 1, 15</p>

	3. Investigate the potential to embed a sustainability procurement officer.	
ANBS14 - Support communities to build resilience and create climate ready places throughout East Dunbartonshire.	<ol style="list-style-type: none"> 1. Develop community-built resilience plans specifically for areas vulnerable to flooding and lower resilience areas. 2. Investigate the potential to create climate and biodiversity community hubs (involving community groups) which provide a central location to co-ordinate emergency response to severe weather, access to local services and workspace bringing people together to develop local projects and social enterprises. 3. Incorporate climate and biodiversity criteria for the development and implementation of place and locality plans. Achieved through generation of milestones and project targets. 4. Investigate the potential to create climate and biodiversity education resources to equip communities with the knowledge and tools to become climate resilient. 5. Explore options to provide climate resilience and biodiversity skills training to communities to support them in adapting to the challenges of severe weather events and protect and enhance local biodiversity. 	<p>Interventions 1.3, 2.1, 2.3, 4.1, 4.2, 4.3, 4.4, 8.8, 11.2</p> <p>Flagship Actions 1, 2, 3, 6</p>
ANBS15 - Develop a climate change and biodiversity impact assessment which is to be undertaken at the inception of every project / policy under development and Council decision-making.	<ol style="list-style-type: none"> 1. Implement the SSN checklist in alignment with wider regional approach. 2. This assessment will be integrated as a key requirement through the Councils existing Impact Assessment Guide and Council / Committee approval process. 	<p>Interventions 9.1, 9.2</p> <p>Flagship Actions 1, 4, 6</p>
ANBS16 - Embed and mainstream adaptation considerations and actions throughout the Local Authority.	<ol style="list-style-type: none"> 1. Support council services in the implementation of adaptation options and delivery actions. 2. Work towards mainstreaming climate adaptation within Council processes and decision-making. 3. Support the development of and delivery of a retrofitting framework to promote and develop climate resiliency (ANBS10). 4. Develop a standardised approach to climate change (mitigation and adaptation) through Service, Corporate and Civil Contingency Risk Registers. 	<p>Interventions 1.1, 1.2, 2.1, 3.2, 4.1, 4.2, 4.3, 8.3, 8.4, 8.5, 8.6</p> <p>Flagship Actions 1, 6, 14, 15</p>
ANBS17 - Develop an internal process to comprehensively record the impacts of climate change on Council	<ol style="list-style-type: none"> 1. Develop a standardised data management and recording process. 2. Implement and promote the agreed process across the Council to record the impacts of extreme weather events on an annual basis. 	<p>Interventions 5.1, 5.2, 5.4</p> <p>Flagship Actions 1</p>

Services, Infrastructure and Operations.		
ANBS18 - Protect critical services (external and internal) to ensure functionality in our changing climate.	<ol style="list-style-type: none"> 1. Undertake an audit of external critical infrastructure and services (HSCP, NHS / Ambulance Service, Police Scotland, Fire Service). 2. Investigate the scope to expand current emergency response plans to produce an extreme weather event multi hazard early warning system in alignment with GCR approach within CRC Climate Adaptation Strategy and Action Plan Flagship Action 5. 3. Conduct an audit of current emergency mobilisation plans for extreme weather events, including water and energy shortages incorporating an area-wide vulnerability mapping exercise. 	<p>Interventions 1.1, 1.2, 2.1, 2.3, 4.4, 5.4, 7.3, 7.4, 7.5, 8.3, 8.4, 8.5, 8.6, 8.8, 9.5, 9.7</p> <p>Flagship Actions 1, 6, 8</p>
ANBS19- Peatland conservation and restoration across the whole of East Dunbartonshire.	<ol style="list-style-type: none"> 1. Undertake area-wide baseline and feasibility study for peatland habitats. 2. Develop management plans for peatland. 3. Identify potential peatland restoration plans. 4. Align conservation and restoration works with carbon sequestration requirements identified through the mitigation consultancy work to inform the CAP development. 	<p>Interventions 2.1, 9.1</p> <p>Flagship Actions 1, 6</p>
ANBS20 - Ensure the council estate is resilient to climate change (including but not limited to offices, schools, leisure facilities, community facilities).	<ol style="list-style-type: none"> 1. Undertake an audit of the Council estates resilience to the impacts of climate change to develop an evidence base and required adaptive measures. 2. Implement all Audit recommendations for adaptation and nature-based solutions to build resilience of the Council estate. 	<p>Interventions 1.1, 1.2, 2.1, 4.2, 4.3, 8.3, 8.4, 8.5, 8.6, 8.8, 9.1</p> <p>Flagship Actions 1, 2, 6, 7, 8, 9</p>
ANBS21 - Continuing to engage with external stakeholders to identify adaptation issues and vulnerabilities to produce relevant Options to action.	<ol style="list-style-type: none"> 1. Liaise with all relevant external stakeholders and service providers regarding resilience planning and capacity. 	<p>Interventions 1.1, 2.1, 2.3, 3.1, 4.1, 4.2, 4.3, 7.3, 7.4, 7.5, 8.3, 8.4, 8.5, 8.6, 8.7, 9.1, 9.5</p> <p>Flagship Actions 1, 2, 3, 6, 10, 13, 15</p>
ANBS22 - Contribute to the delivery of adaptation at a Glasgow City-Region level.	<ol style="list-style-type: none"> 1. Continued membership to be a key partner organisation with Climate Ready Clyde. 	<p>All CRC Strategy and Action Plan Interventions and Flagship Actions</p>

	2. Continued involvement with all existing and emerging CRC Forums and Working Groups to help deliver the Interventions and Flagship Action from the City-Region Adaptation Strategy and Action Plan	
--	--	--

Adaptation Financing and Resourcing

Globally, there is considered to be a large adaptation finance gap, which is defined as the difference between the amount of finance flowing into adaptation, versus the total estimated need. At the global level, adaptation finance comprised approximately 7% of total global climate finance flows for 2020/21 (Climate Policy Initiative, 2021). The available evidence suggests that estimated adaptation costs, and likely adaptation financing needs, are five to ten times greater than current international public adaptation finance flows (UNEP, 2021).

- “Filling the investment gap for adaptation is critical to achieving the goals of the Paris Agreement. Finance to adaptation, from both public and private actors, must be scaled by orders of magnitude to respond to current and oncoming climate risks” **Climate Policy Initiative, Global Landscape of Climate Finance, December 2021**

This leads to a question of whether there is enough adaptation finance available to address the impacts identified in the UK 3rd independent Climate Change Risk Assessment (CCRA3). In Scotland, most major public funding schemes on climate change focus on mitigation, and the level of available adaptation finance flows are likely to be far below what is needed. This gap poses a major threat to the Scottish economy as well as the health and wellbeing of people and ecosystems. Whilst the case for increased adaptation investment is clear there are significant barriers that impede the flow of finance, including:

- **Economic/financial:** adaptation actions can deliver significant *economic* benefits, but often lack *financial* returns
- **Mismatch in timing:** adaptation actions involve up-front costs, to deliver medium and long-term benefits
- **Information gaps:** lack of reliable, accessible information on climate risk and benefits of adaptation actions
- **Project design:** adaptation actions are often site and context specific, not easily replicable at scale
- **Policy constraints:** conflicting or competing policy objectives and competition for public finance resources

The [Glasgow City Region Adaptation Strategy and Action Plan](#) identifies the need for a “revolution in finance” to ensure that the funds and resources necessary to build climate resilience and achieve the strategy’s transformative vision are made available. The Climate Ready Clyde [Resource Mobilisation Plan](#) proposes the idea of an Adaptation Finance Lab to act as a focal point to help accelerate progress towards this aim. Flagship Action 12 of the Adaptation Action Plan sets out the intention to establish an *Adaptation Finance Lab* to:

- Support innovative financing models for adaptation action within Glasgow City Region
- Develop a pipeline of investable adaptation projects to match with suitable financing

An initial [strategic outline business case](#) for the Adaptation Finance Lab was also developed as part of the Clyde Rebuilt project. This was part of the EU-funded Resilient Regions Deep Demonstration programme and was delivered in partnership with EIT Climate-KIC (the EU’s climate innovation agency) and Paul Watkiss Associates (specialist climate and economics consultancy).

In January 2023, the CRC Action Group met for a focused discussion and exploration of the Adaptation Finance Lab. The meeting aimed to establish a common understanding of the work to date (and of

related work on climate finance through the [Glasgow Green Deal](#)), to collectively review the strategic outline business case for the Adaptation Finance Lab, and to agree next steps.

The Action Group agreed that they are supportive of developing the concept of the Adaptation Finance Lab further by progressing to a more detailed business case, however further work is required to better articulate the focus and benefits of the lab, and to define the service it would provide. This would need further consultation with potential users of the lab and key stakeholders, as well as potential financial investors. It was also clear that any Lab would need to be integrated where appropriate with proposals to support financing of climate adaptation in Glasgow City Region, and to maximise synergies with emerging developments on natural capital finance.

It was agreed that the CRC Secretariat would:

- Explore options, including potential timeframes and costs, for developing the Strategic Outline Case for the Lab into a more detailed business case
- Develop clear recommendations for next steps to develop Lab concept further

From a Local Authority perspective, indicative costs ranges have been assigned to each proposed Adaptation and Nature-Based Solution Options and set of Delivery Actions (Set out within **Paper 4 – Adaptation and Nature-Based Solutions Options Evidence Sheets**). At the next stage of the CAP production, we will undertake further work to develop and refine the adaptation cost framework. The primary route for us to achieve this will be through the collaborative working with CRC on the Adaptation Finance Lab and its outcomes.

Next Steps

1. Following agreement of the Options and Delivery Actions, these will be further developed and costed in more detail in the Draft Climate Action Plan before being consulted upon.
2. Develop Adaptation and Nature-Based Solutions Policy Framework to increase/build resilience levels of the Council and area-wide and incorporate into the Draft Climate Action Plan.
3. Mainstreaming Adaptation: Ensuring adaptation is still achievable through successful mitigation and embedding adaptation within all Council-wide decision-making, operations and processes.