Appendix 2

ABERDEEN ADAPTS

Updated Climate Adaptation Framework 2022

Building resilience and adapting to the changing climate

Aberdeen Adapts December 2019
Aberdeen Adapts V0.2 February 2022

Appendix 2

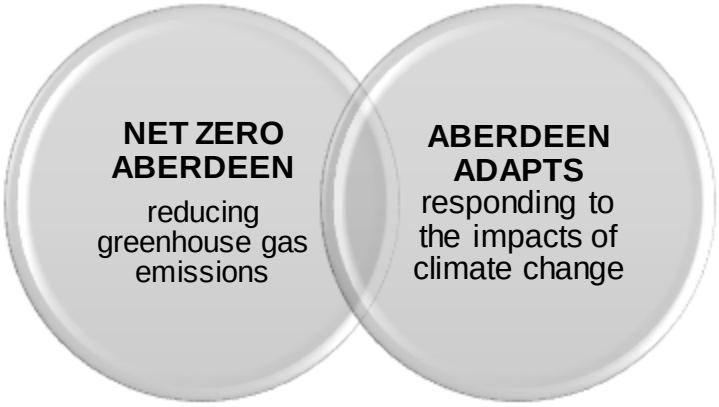
Contents				Page
			Executive Summary	3
1.	Introduction	1.1	About Aberdeen Adapts	4
		1.2	Support from Adaptation Scotland	4
		1.3	Acknowledgements	5
		1.4	Aligning with Net Zero Aberdeen	5
		1.5	Strategic Environmental Assessment	5
2.	Informing Aberdeen's Climate Adaptation Framework	2.1	Why do we need Aberdeen Adapts?	7
		2.2	Key drivers behind this Framework	8
		2.3	Aberdeen's changing climate	9
		2.4	Evidence base for Aberdeen Adapts	9
		2.5	Climate challenges for Aberdeen	10
3.	Aberdeen Adapts Approach	3.1	Overarching principles	13
		3.2	About the Framework	13
		3.3	Collaborative working	14
		3.4	Funding actions	15
		3.5	Monitoring	16
		3.6	Review	16
		3.7	Theme co-benefits	16
4.	Themes	4.1	Buildings & infrastructure	17
		4.2	Flooding and coastal change	21
		4.3	Our natural environment	25
		4.4	Society and economy	29
		4.5	Building understanding	33
	Glossary			36
	Appendix 1		Monitoring Framework	38
	Appendix 2		Aligning with the SDGs	39
	Appendix 3		Resilience – category 1 & 2 responders	40
	References			41

Executive summary

Aberdeen Adapts is a framework for city-wide working on adaptation. Incorporating the views of local organisations and communities, it sets the direction to build long term city resilience.

Aberdeen Adapts will sit alongside Net Zero Aberdeen.

As we drive forward with the change needed to meet our net zero ambitions, we need to build in resilience, taking action to prepare for inevitable changes in climate.



We need to adapt…

The global climate is changing and this is expected to accelerate in coming decades. For Aberdeen this will mean warmer, wetter winters; hotter, drier summers; a rise in sea level; and less snow, ice and frost.[1]
This framework sets the direction for adaptation, with priorities, goals and action areas that will help Aberdeen to prepare.

- It includes actions to **prevent** impacts from climate change and where there is likely to be change, to **protect** people and places.
- It understands that in some areas we need to learn more to **inform** decision making and that it is important to remain flexible in approach, to incorporate new information.
- In others, we should strive to **innovate** and make use of new technology.
- The key to adaptation for Aberdeen is to **collaborate**, share experiences, build knowledge and understanding and work together to develop solutions.

Aberdeen has already started the adaptation journey…

Aberdeen Adapts builds on the strategic plans and local actions that are already helping to strengthen city resilience.
By learning from these measures, Aberdeen is well placed to develop the adaptation solutions that can make sure local people, places and businesses are climate ready

Appendix 2

1. Introduction

Temperature, rainfall and sunshine in the UK for 2020 were in the top-ten highest on record.[2] From wetter weather to warmer temperatures the climate is changing and this will bring considerable new challenges for Aberdeen.

The north east has seen the impacts of severe weather events, including damage and disruption from Storm Frank, the Beast from the East and more recently Storm Arwen.

Taking urgent climate action is one of the UN Sustainable Development Goals (Appendix 2)[3] and cities around the globe are taking active steps to adapt to climate change. In doing so, they are planning ahead and delivering long term solutions that protect people and places, as well as sustain innovation and growth.

Why a framework?

Our city will need to prepare, taking action to prevent, reduce and where required, adjust to climate impacts. This is a high level overarching framework outlining long terms goals, objectives and areas for collaboration. Alongside it recognises the local partnerships and plans already contributing to city adaptation.

This framework aims to establish a forward thinking, co-ordinated approach to improve the resilience of Aberdeen, helping to keep it open for business, reducing the risks and costs of damage and disruption. Climate change will affect organisations, businesses and communities across Aberdeen. No individual organisation has all the solutions and collaboration is essential to direct and deliver joined up adaptation action.

1.1 About Aberdeen Adapts

Aberdeen Adapts was originally approved in 2019. 41 local public bodies, businesses and communities input to the development of this framework through a series of stakeholder workshops, informed the local priorities, key climate challenges affecting various city sectors and adaption approaches for Aberdeen. In addition, 6 classes from several city schools took part in Climate Ready Places[4] workshops; an Arts and Climate Change Mini Festival was piloted, exploring new ways to engage the public in climate change; and a public consultation was held, receiving 70 responses.

Aberdeen Adapts was refreshed in 2022 to align with the Net Zero Aberdeen Routemap and to take on board new information, policy drivers and climate risks.

1.2 Support from Adaptation Scotland

Adaptation Scotland provided support for the initial development of Aberdeen Adapts, following a competitive application process led by Aberdeen City Council and the University of Aberdeen. Their knowledge and expertise with other partnership projects including, Climate Ready Clyde and Edinburgh Adapts enabled Aberdeen to draw on effective learning, actions and engagement processes. The Adaptation Scotland programme provides information, advice and support on climate adaptation for organisations in Scotland. The programme is funded by the Scottish Government and delivered by Sniffer.

Appendix 2
Links with the University led to several student placements and student led surveys on adaptation.

1.3 Acknowledgements

City organisations and communities who participated in the development of Aberdeen Adapts:

- Adaptation Scotland
- Aberdeen Performing Arts
- Aberdeen Biodiversity Centre
- Aberdeen City Council
- Aberdeenshire Council
- Aberdeen Climate Action
- Aberdeen City Heritage Trust
- Aberdeen City Health & Social Care Partnership
- Ashley Road Primary School
- Archaeology Service
- Bridge Of Don Academy
- Bridge of Don Community Council
- Castlehill and Pittodrie Community Council
- Creative Carbon Scotland
- Cults, Bieldside & Milltimber Community Council
- Culter Community Council
- Dee Catchment Partnership
- East Grampian Coastal Partnership
- Food Standards Scotland (Aberdeen)
- Forestry Commission
- Friends of Seaton Park
- Garthdee Community Council
- Grampian Energy
- Grampian Housing Association
- James Hutton Institute
- Middlefield Community
- NESTRANS
- NESBReC
- NHS Grampian
- PAS – Planning Aid for Scotland
- River Dee Trust
- RGU
- Scottish Enterprise
- Scottish Flood Forum
- Scottish Water
- SEPA
- SNH
- SSE
- Strategic Development Planning Authority
- University of Aberdeen
- Walking-the-Talk
- Woodside Primary School
- 2050 Climate Group

1.4 Aligning with Net Zero Aberdeen

Net Zero Aberdeen is a Route-map to becoming a net zero city by 2045, targeting 6 key themes. Reducing global emissions, is essential to limit the impact of climate change. However, there will still be change. As net zero actions accelerate it will be essential to integrate actions to adapt, through Aberdeen Adapts to avoid locking in climate risks. The Climate Change Committee includes integrating adaptation into policies, including for Net Zero, as one of their 10 principles for good adaptation planning.
Synergies and interdependencies between Aberdeen Adapts and Net Zero Aberdeen are noted at the end of each theme section.

1.5 Strategic Environmental Assessment

A Strategic Environmental Assessment has been completed for Aberdeen Adapts, to meet the Environmental Assessment (Scotland) Act 2005. The Environmental Report[5] sets out the likely effects of Aberdeen Adapts, including the priorities, goals and action areas, on the environment. It includes how significant negative effects could be addressed by mitigation

and how any significant effects on the environment will be monitored. The findings were used to inform the Aberdeen Adapts Framework. Measures to work with partners to adapt to climate change and enhance the positive effects of Aberdeen Adapts, include:

- Reducing fragmentation; and protecting and enhancing biodiversity.
- Reducing emissions during any project development and protecting air quality.
- Making efficient use of water and protecting the water environment.
- Protecting soil health and stability.
- Protecting and enhancing valued landscapes, their character and setting.
- Minimising risks to people in Aberdeen and their health.
- Protecting the historic environment.

Appendix 2

2. Aberdeen Climate Adaptation Framework

2.1 Why do we need Aberdeen Adapts?

Preparing for severe weather and climate change is essential to protect Aberdeen's people, places, public bodies and businesses including:

Protecting people	• Flooding, erosion, tidal surge and heatwave events could affect the health and wellbeing of those who live, work and visit Aberdeen.[6] For vulnerable people, the impacts could be even greater, widening inequalities.[7]
Safeguarding assets	• Reduce damage to Aberdeen's buildings and infrastructure and preserve the structure and function of city assets. • Prevent a loss of value and increased insurance costs.[8]
Robust decision making	• What we build, how we invest, these decisions need to be robust, resilient and cost-effective in the long term. The effects of climate change are far ranging and the lifespan of projects and infrastructure can be affected. • A growing demand by investors, lenders and insurance underwriters, for decision-useful, climate-related financial information.[9]
Reduce costs	• Estimates of the economic costs of climate change to the UK could be from 1 to 1.5% of GDP a year by 2045.[10] • Without interventions, the estimated average annual damages from flooding alone in Aberdeen could approximately £12.5 million. • By taking timely action, funding opportunities can be accessed; there is time to establish low or no cost adaptation responses; and adaptation can be embedded into policy and decision-making to avoid costs of remedial action in the future.
Improving use of resources	• Organisations and businesses across Aberdeen will be facing climate challenges. A joined up approach can make best use of local resources, improve co-operation, avoid duplication and enhance business continuity.
Delivering multiple benefits	• Adaptation actions can deliver a range of co-benefits helping to reduce energy costs, flood risk, increase biodiversity and support health and wellbeing. Examples include, Maidencraig flood alleviation scheme helping to prevent flooding downstream, while integrating paths to provide connections and environmental improvements.
Meeting regulation	• Adapting to climate change is a duty, for most public sector organisations, under the Climate Change (Scotland) Act 2009[11] to protect critical services and infrastructure. • Adaptation action should help deliver relevant outcomes under Climate Ready Scotland,[12] the second Scottish Adaptation programme 2019-2024.

UK Climate Projections	• UK Climate Projections provide information on projected changes to climate. UKCP18 data was used to inform Aberdeen Adapts.
Supporting growth	• Adaptation brings potential opportunities for innovation, research, retrofit and skills development.
Supporting place based outcomes	Embedding adaptation into revised and emerging city documents will help with work to meet regulation and strengthen city resilience. Adaptation can help deliver wider city outcomes in a range of plans, programmes and strategies including: • Local Outcome Improvement Plan, includes a climate change outcome to reduce emissions and adapt. • Local Transport Strategy has an aim to ensure that the transport network is as resilient as possible to flooding and contingency conditions are developed. • Aberdeen's Open Space and Nature Conservation Strategies both include considerations for climate change. • North East Flood Risk Management Plan addresses flood risk in the city, as part of a regional approach to managing flood risk. • Aberdeen Strategic Development Plan sets priorities for water efficiency and flood management. • Aberdeen Local Development Plan addresses flood risk and coastal threat. • Strategic Infrastructure Plan – Energy Transition includes the goal, Aberdeen's infrastructure is adaptable to changes in climate.

2.2 Key drivers behind this Framework

International
EU Adaptation Strategy
Paris Agreement, a legally binding international treaty on climate change.
The "Glasgow Climate Pact"- agreed at the UN Climate Change Conference (COP26) in November 2021 set up processes towards delivering a global goal on adaptation.
IPCC Summary for Policymakers: Global Warming of 1.5°C. An IPCC Special Report' 2018
Intergovernmental Panel on Climate Change (IPCC) assessment report, AR6 Climate Change 2021: The Physical Science Basis indicated that human induced climate change is already affecting many weather and climate extremes.
United Nations Framework Convention on Climate Change
Climate Action is one of the 17 UN Global Goals, encouraging urgent action to combat climate change and its impacts.
National
Stern Review on the Economics of Climate Change, 2006 concluded the benefits of strong and early action far outweigh the economic cost of not acting.

Climate Change Act 2008, sets a framework for a UK reduction in greenhouse gas emissions and provision for adaptation to climate change.
Third UK Climate Change Risk Assessment 2022. The assessment is required by the Act and updated every 5 years.
UK Climate Projections (UKCP18) provide evidence on projected changes to climate.
Committee on Climate Change Independent Assessment of UK Climate Risk identified 8 areas of risk requiring most urgent attention in the next 2 years.
Evidence for the Third UK Climate Change Risk Assessment – Summary for Scotland identified 61 risks, 51 with high urgency scores for Scotland
UK Climate Resilience Programme, bringing together climate research and expertise.
Supplementary Green Book Guidance: Accounting for the Effects of Climate Change
Climate Change Scotland Act 2009, includes objectives in relation to adaptation.
Part 4 of the Act places duties on the public sector to act in the way best calculated to help deliver the Scottish Adaptation Programme.
Climate Ready Scotland: 2nd Scottish Adaptation Programme, updated every 5 years and addresses climate risks for Scotland identified in the UK Climate Risk Assessment.
Flood Risk Management (Scotland) Act 2009
National Flood Risk Assessment (NFRA) 2018

2.3 Aberdeen's changing climate

In Scotland, there is already evidence of a changing climate. Temperature and rainfall increases have been observed over the last few decades and there has been a reduction in air and ground frost, as well as snow cover.

Future climate - Aberdeen

UK Climate Projections show that these changes are likely to increase in the future. For Aberdeen, these indicate:

- A **reduction** in summer rainfall which could affect water quality and availability.
- An **increase** in autumn/winter rainfall. This won't mean more rainy days, but when it does rain it will be much heavier.
- There will be an **increase** in temperatures across all seasons.
- In winter there will be **less** snow, ice and frost days, although there could still be an extreme snowfall event.
- In summer there will be an **increase** in temperatures and what we consider a heatwave could occur more frequently.
- There will be a **rise** in sea level.

2.4 Evidence Base for Aberdeen Adapts

An assessment of climate risks has been produced in a separate, Evidence Base for Aberdeen Adapts. This takes on board information relevant to Aberdeen from UK Climate Projections UKCP18 and relevant risks identified in the Third UK Climate Change Risk Assessment. The Evidence Base is a live document and identifies climate risks relevant to

Aberdeen, actions already taking place; and in line with the UK approach, indicates where more action is needed, where further investigation is required, where action should be sustained and areas that need monitored.

2.5 Climate challenges for Aberdeen

Familiar with experiencing all four seasons in just a day, Aberdeen tends to weather the weather, ready and prepared for the fluctuations. However, the climate is changing and this will bring more extreme and variable conditions:

Increased risk of flooding

Climate change is likely to alter rainfall patterns. More intense downpours will bring rising rivers, place drainage systems under pressure and increase flood risk. Investment is being made in city flood management schemes, though flooding may still occur.

Change at our coast

The coastline is a defining characteristic of Aberdeen. Rise in sea level is set to accelerate over coming decades. Along with storm surge conditions, this brings threat of coastal flooding, and wave overtopping in storm surge conditions. Erosion and retreat in soft parts of the coastline is a dynamic, natural process but it can affect people and places.

Performance of city buildings

City buildings and their surroundings will need to withstand heavy rainfall events and the risk from flooding and water penetration to reduce the risk of damage, leaks and damp, affecting people's health and insurance costs. Current indications are 16% of city buildings are affected by condensation and 15% by damp. More is needed to understand risks of overheating for city building types in warmer temperatures; as well as risks of subsidence.

Availability and quality of water

Increases in the frequency and severity of summer droughts in Scotland would cause problems for water quality and supply during periods of drier weather and low river flows. Growth for the city will need to prioritise water efficiency to avoid increasing demands on water supply. The River Dee provides drinking water for over 300,000 homes in Aberdeen and Aberdeenshire, itself a Special Area of Conservation, meaning low flows will bring ecological pressures.

Infrastructure connections and interdependencies

Increased incidences of flooding, landslides, drought and heatwaves have the potential to cause major disruptions. Infrastructure networks interdependencies, mean emergencies in one area can quickly spread meaning cascading risks from the failure of critical infrastructure for energy, transport, water and ICT networks.

Transport Infrastructure

Aberdeen's northerly location means there is a strong reliance on transport for goods, travel and business. The performance of transport networks in and around the city will be challenged by increased temperatures, heavy rainfall, landslip and flooding. Collaborative working on transport takes place at regional and local level.

Appendix 2

Health of our natural environment

Climate change may affect habitats and species in Aberdeen. Some Scottish species may struggle and could be lost if their habitats are fragmented or there is a loss of food sources. Invasive non-native species may thrive, while degraded habitats may not be able to sustain productive land or water supply. Heavy rainfall and flooding will result in more sediment, erosion and pollution to watercourses.

Health of our marine environment

The effects of climate change, alongside other pressures on marine species, from plankton through to fish, mammals and sea birds is already being noted. Rising sea temperatures are likely to affect food sources of marine species and lead to changes in distribution. A warmer North Sea will favour warm-water species such as hake, but could be less favourable for cold water species such as haddock and white-beaked dolphin.

Need for resilience and opportunities for businesses

Climate change and extreme weather may cause damage to business stock, assets and premises and result in a loss of productivity. Disruption to transport, energy and communication networks in Scotland and around the world could affect markets and supply chains, as well as raise insurance costs. £114 million is the expected annual damages from flooding alone to non-residential properties in Scotland.[6] Alongside resilience planning will be needed for water intensive industries during drier spells. There is a growing, global need for technology and services to help manage and reduce climate risks.

Health and wellbeing of our people

Periods of wetter, warmer weather could affect the old, young or those with some health conditions. It could increase levels of damp increases in damp and air pollution that could affect people with respiratory illness. Flooding could impact and people's physical or mental health, as well as healthcare sites and services; and many hospital wards in the UK are thought to be of a type prone to risk of overheating during hot weather. Climate change could affect patterns of disease and other health issues.

Aberdeen's cultural heritage and identity

Flooding, landslip and vegetation change have the potential to alter land and seascapes affecting the character of the Granite City. Climate change is also a threat to Aberdeen's historic environment, causing potential damage and loss through coastal erosion, flooding and wetter, warmer conditions. Those involved in the care, protection and promotion of historic and cultural environments will have to consider the impact climate change could have on the features that give Aberdeen a sense of place and identity.

Energy security and efficiency

Extreme weather including flooding and water variability could affect the performance of local energy infrastructure. Weather extremes could impact power distribution, including through damage from storms, flooding and reduced transmission efficiency from temperature fluctuations.

Security of food supply

Around 3,200 food and drink businesses are in the north east Scotland. Shocks in global food markets could affect supply chains and the costs and availability of products.

Increases in temperatures have the potential for a longer growing season and opportunities for food producers.

Productivity of woodlands

A warming climate has the potential to improve growing conditions in the north east and increase the productivity of Aberdeen's trees and woodlands. However, climate change will also pose a number of threat to tree health, from more variable and extreme weather causing periods of soil saturation and drought; to the spread of pests and diseases, with some species less able to cope with the new conditions.

Occurrence of pests and disease

A changing climate, will create new conditions that may allow existing pests and disease to spread and new threats to become established in Scotland. If not properly managed, these pests and diseases have the potential to cause serious impact to the health of our people, animals, plants and ecosystems.

Quality of our soils

Heavy rainfall and changing temperatures will affect soils over time; reducing soil function, increasing flood risk and causing erosion. Healthy soils are relied on for biodiversity, agriculture and forestry, to absorb water and store carbon. The State of Scotland's Soil ranks climate change as the greatest aggregated pressure on soils.

Appendix 2

3. Aberdeen Adapts Approach

3.1 Principles

Key overarching principles underpin the Aberdeen Adapts Framework and support adaptation for the city.

Prevent	• Build adaptation into plans, policies and ways of working, to reduce and avoid the need for remedial action.
Protect	• By planning early interventions, we can take the most appropriate and cost-effective adaptation steps.
Inform	• Through research and cross sector actions we will build understanding of what works for Aberdeen.
Collaborate	• By working collaboratively we will exchange skills and knowledge; and co-ordinate adaptation activity.
Innovate	• Through innovation and technology we will explore adaptation solutions.

3.2 About the Framework

The Aberdeen Adapts Framework sets out 5 cross cutting **themes,** providing a focus for adaptation in Aberdeen:

- Buildings and infrastructure.
- Flooding and coastal change.
- Our natural environment.
- Healthy society and strong economy.
- Building understanding.

Priorities, **goals, objectives** and **areas of focus** for collaborative working on city resilience:

- **Our Priorities** – this summarises what the theme needs to achieve, defining the theme purpose.
- **Our Goals** - under each priority, a series of goals set the long-term ambition for city resilience could mean for the city by 2050, if steps have been taken to adapt.
- **Our Objectives** – set out the approach to delivering the goals.
- **Areas of focus** - to help meet the goals and objectives, areas of focus for partnership working are set out. These identify areas to strengthen city resilience. The approach is outlined in Figure 1.

Appendix 2
Figure 1: Aberdeen Adapts summary

Theme Priority	Goals for 2050
Buildings & infrastructure Addressing climate change in the planning, build, maintenance and protection of city buildings, infrastructure and heritage.	1.Protecting buildings & preserving heritage
	2.Resilient travel & infrastructure
	3.Secure utilities & communication networks
Flooding & coastal change Strengthening flood risk management, protecting the coastline and increased use of nature-based solutions.	4. Manage & minimise flooding
	5. Increase in nature based solutions
	6. Protecting watercourses & coastline
Our natural environment Monitoring for change, responding to pressures and adapting through nature, for a healthy and productive natural environment.	7. Increased space for nature
	8. Healthy & productive soils
	9. Trees & woodlands: protected & enhanced
Society & economy Healthy, resilient communities and strong, robust businesses, with the capacity and knowledge to adapt.	10. Prepared & connected communities
	11. Health, wellbeing & climate justice
	12. Increased business resilience
	13. Increased food security
Building understanding Increased understanding of climate impacts, with local communities, businesses and organisations empowered to adapt.	14. Climate research
	15. Climate aware

Adaptation objectives and areas of focus

3.3 Collaborative working

Climate change isn't a challenge affecting one organisation or sector alone. With so many interdependencies, joint working on adaptation between organisations, businesses, communities, neighbouring local authorities, research and education institutes will be vital to keep the city safe, operating and ready for business in the long term.

Aberdeen Adapts sets out the framework for collaborative action, to target local adaptation challenges and priorities. Alongside liaising with existing relevant partnerships working to keep the city safe and secure.

The changing climate will continue to create risks, but strong partnership working will help to identify any additional pressures from climate change and the steps needed to plan, adjust, prepare and build resilience.

While Aberdeen Adapts has a city focus, there is a need to liaise on impacts for the region The city and shire are connected by coastline, and through the paths of the Rivers Don and the Dee and transport corridors meaning some climate impacts are shared.

Delivering Aberdeen Adapts

- Aberdeen Adapts is a long-term framework.
- A collaborative *Implementation Plan* will be produced this will take an iterative, phased, informed approach.
  - Incorporating low and no regret actions
  - Building flexible pathways to adjust to change or new information.
- The plan will prioritise actions considering:

Cost - benefits of adaptation
Risk priorities
Feasibility
Net zero synergies
Finance models

3.4 Funding actions

Early action to adapt to climate change will allow time to plan ahead to avoid costs through informed decision making and to develop low or no cost actions that can benefits wider city outcomes.

For some adaptation actions, seeking appropriate sources of funding can help to protect people and assets and save money in the long term. This could include costs for research and studies; for developing and implementing adaptation measures, such as building and infrastructure retrofit; or to help monitor change and the effectiveness of adaptation actions.

Appendix 2

A range of funding opportunities have been identified that could be accessed to support adaptation. Where required, funding routes will be investigated for appropriate for individual actions, such as grants and external funding, collaborative working, national subsidies and support packages and capital investment programmes.

3.5 Monitoring

As Aberdeen Adapts gets underway, monitoring will allow the learning from actions to be captured, evidenced and assessed. This information can inform decision making and any wider roll out and mainstreaming of adaptation activity.

Monitoring will also help to assess any change in vulnerability in the city, such as changes in rainfall to see how it is affecting Aberdeen and to help make sure the implementation actions are appropriately targeted.

A mix of initial qualitative and quantitative indicators to support monitoring of Aberdeen Adapts are set out in the action summary *Appendix 1.* Further indicators will be developed to track shorter term actions under the *Implementation Plan*, building on those already in place across existing plans and policy.

3.6 Review

Aberdeen Adapts will be reviewed every five years as a minimum, to ensure the framework is on track and aligned with new information including updates to climate projections, climate trends and climate risks for the region and will be updated where there are material changes.

Further assessment may be required where any project to implement Aberdeen Adapts could have an impact on the environment.

3.7 Theme co-benefits

	Buildings & infrastructure	Flooding & coastal	Natural environment	Society, economy	Building understanding
Improved health & wellbeing	●		●	●	●
Improved air quality	●		●	●	●
Protect/ enhance biodiversity		●		●	
Climate just		●		●	●
Skills development	●		●	●	●
Economic growth	●		●	●	●
Placemaking	●	●	●		●
Reduces risk of flooding		●		●	●
Helps conserve natural resources			●		

Themes

4.1 Buildings and infrastructure

4.1.1 Priority

Understanding risks to the Granite City's built environment, addressing climate change in the planning, build, maintenance and protection of city buildings, infrastructure and heritage.

4.1.2 Key challenges for buildings and infrastructure

How will we:

1. **Manage** risks to the performance of city buildings avoiding future retrofit.
2. **Prevent** damage and deterioration of buildings and infrastructure.
3. **Assess** the vulnerability of local travel networks from flooding, storms, landslip and heat.
4. **Adapt** buildings at risk, so they are less likely to be damaged by flood water and easier to clean up if flood water does occur.
5. **Protect** Aberdeen's cultural heritage from flooding, water penetration and erosion.
6. **Minimise** disruption to transport routes.
7. **Identify** impacts on thermal comfort levels and any projected increase in summer cooling demand.
8. **Manage** the security and efficiency of energy supply during and following weather extremes.
9. **Collaborate** on network connectivity and infrastructure interdependencies.
10. **Establish** smart solutions to monitor change and inform during and following severe weather events.
11. **Protect** the availability and quality of water.
12. **Address** competing demands for water between households, agriculture, industry and the needs of the natural environment.

4.1.3 Drivers

UK	Climate Change Committee, UK Housing – Fit for the Future? report
	Updated projections of future water availability
Scotland	Historic Environment: Scotland's Climate Change Impacts Guide for the Historic Environment
	Scotland's Dynamic Coast map
	Flood Risk Management (Scotland) Act 2009
	National Flood Risk Assessment (NFRA) 2018
	Living with Flooding Action Plan
	National Planning Framework for Scotland
	Planning (Scotland) Act 2019
	Building Standards

	Infrastructure Investment Plan for Scotland 2021-22 to 2025-26
	National Transport Strategy
	Design Manual for Roads and Bridges
	National Water Scarcity Plan (SEPA)
Regional	North East Flood Risk Management Plan
	NESTRANS Regional Transport Strategy – NESTRANS 2040
Aberdeen	Local Housing Strategy
	Aberdeen City and Shire Strategic Development Plan
	Aberdeen Local Development Plan
	Aberdeen's Local Transport Strategy
	City Centre Masterplan
	North Beach Coastal Protection study

4.1.4 Approach

Goals	
Protecting buildings and preserving heritage	
Resilient travel and infrastructure	
Secure utilities and communications networks	
Objectives	**Measures**
i. Identify, assess and monitor climate related risks to the city built environment.	No. climate risk assessments Building condition/ disrepair Uptake of property level protection measure Evidence of appropriate retrofitting adaptation Data from inspection regimes No. participating in training No. days River Dee falls below Q95 low river flow
ii. Embed climate resilience into planning, design, upgrade and policy for buildings and infrastructure.	
iii. Use of technological solutions to protect infrastructure, inform people and monitor change.	
iv. Encourage maintenance and protection for city buildings; local transport infrastructure; and historic and cultural environments.	
v. Support skills development in adapting buildings; and in the care and protection of traditional buildings and assets.	
vi. Increase resilience for energy, water and communications through collaboration, forward thinking and innovation.	

About the approach

i. Identify, assess and monitor climate related risks to the city built environment

- Assess climate impacts for city building types and infrastructure.
- Assess the vulnerability of Aberdeen's heritage to climate change and identify retrofit opportunities to increase resilience for those at risk.

- Investigate opportunities and risks from temperature and rainfall change to local energy systems to help to keep them productive and secure in the long term.

ii. Embed climate resilience into planning, design, upgrade and policy for buildings and infrastructure to reduce and prevent damage and costs in the long term.

- Inform designers, developers, planners, asset managers and home owners on ways to adapt Aberdeen's built environment.
- Incorporate adaptation into new development and upgrades through design, and where appropriate water efficiency, shading, ventilation and property-level flood resilience.

Incorporate adaptation into new development, upgrades and retrofit

Consider building location, ground conditions and orientation.

Energy and water efficiency.

Use materials resilient to a changing climate.

Use of green space and permeable surfaces around buildings, to absorb rainfall and reduce flood risk.

Address the risk of overheating in summer.

Consider whole life costs.

Integrate green infrastructure

iii. Use of technological solutions to protect infrastructure, inform people and monitor

- Investigate opportunities to use technology to support adaptation in Aberdeen, through mapping, modelling and monitoring to support a more flexible and responsive approach to weather extremes.
- Develop digital solutions to support travel planning and create smarter travel options, helping to inform journeys during and following severe weather.
- Extend opportunities for home and remote working, including remote working hubs.
- Increase use of apps, gauges and sensors for early alert systems on severe weather and flooding helping to protect vital infrastructure.
- Build resilience into Aberdeen's emerging digital infrastructure to help protect smart city applications from weather shocks and stresses.

iv. Encourage maintenance and protection for city buildings; local transport infrastructure; and historic and cultural environments.

- Continue regular inspection, to identify issues early and to limit or prevent damage to local travel and coastal infrastructure. Monitoring for change in maintenance demands and timelines, strengthening protection, where and when required.
- Develop local skills and knowledge in adapting buildings, infrastructure and the care and repair of traditional buildings.
- Raise awareness of property protection measure.

v. Increase resilience for energy, water and communications through collaboration, forward thinking and innovation.

- Assess and investigate opportunities and risks from temperature and rainfall change, to local energy systems to help keep them productive and secure in the long term.
- Promote efficient water use during drier spells to reduce stress on water supply.
- Increase uptake of water efficiency appliances and fittings and the use of water saving technology, such as grey water recycling and rainwater harvesting in new development and regeneration.
- Promote natural solutions to the cooling and ventilation of buildings vulnerable to heat in Aberdeen.

4.1.5 Net Zero Aberdeen synergies

This theme has a strong relationship with **Net Zero Aberdeen**, with a need to build resilience into emerging energy and transport infrastructure and understand changes to energy demand. Net zero fabric improvements can have co-benefits in reducing risk of damp and water penetration.

Appendix 2

4.2 Flooding and coastal change

4.2.1 Priority

Strengthening flood risk management, protecting the coastline and increased use of nature-based solutions.

4.2.2 Key challenges for flooding and coastal change

How will we:

1. **Manage** increased risk of flooding rivers, surface water and coastal.
2. **Manage** our outdoor spaces in ways that can help reduce the extent of flooding, providing space for flood water and absorbing rainfall through greenspace.
3. **Reduce** pressure on drainage systems.
4. **Adapt** buildings that are already at risk, so they are less likely to be damaged by flood water and easier to clean up if flood water does occur.
5. **Build** understanding of and reduce levels of urban creep adding to risks of surface water flooding.
6. **Increase** understanding of the dynamics of soft coastal areas.
7. **Strengthen** coastal areas from inundation, wave overtopping and erosion.
8. **Implement** actions at a pace with change.

Flood risk management

Planning cycles and action for flood risk management are in place. The first North East Local Flood Risk Management Plan (NELFRMP), was produced in partnership with SEPA, Moray Council, Aberdeenshire Council and Scottish Water and was approved in 2016. The plan identified and mapped local areas potentially vulnerable to flooding and sets out a range of flood risk management actions including those for the city and a range of city schemes are already in place and being developed. Since then, work has taken place to develop the strategies and plans for Cycle 2 of the plan.

Enabling prompt response to flood alerts, the Council operate a Duty Flood Officer rota, checking SEPA Water Levels for the Rivers Dee and Don and monitoring coastal tide levels. Where there is surface water flood risk, the status of priority hakes and gullies are checked so these can be cleared.

Blue-green infrastructure is supporting water management an example includes Maidencraig flood alleviation project.

Coastal management

Monthly visual inspections take place for any defect or issues with the rock armour, seawall structures, including ramps and steps; and condition of timber groynes. Beach levels are also monitored on a bi-weekly basis, these can vary naturally along the Aberdeen coastal front, low sand levels present a risk to the stability of the seawall and a risk to the public access and safety.

Scotland's Dynamic Coastal map and the assessment of coastal protection under the North East Flood Risk Management Plan have identified areas along the shoreline potentially vulnerable to future flooding and erosion. The Footdee Coastal Flood Study (2018) and

Aberdeen Strategic Overview of Coast Protection (2019) are helping to inform understanding of coastal flood risk.

Watercourses

Maintaining catchment management with key partners will be essential to conserve and improve watercourses during peak and low flows. The River's Dee and Don form an important part of the local landscape and strong catchment planning can help protect water quality and quantity, as well as reduce impacts from temperature, flooding and pollution on aquatic life. Heavy rainfall and flooding will result in more sediment, erosion and pollution to watercourses. A River Basin Management Plan is addressing pressures on the condition of the water environment, water quality and quantity. Collaborative working through the Dee Catchment Partnership is working to protect and improve the waters.

4.2.3 Drivers

Scotland	Scotland's Dynamic Coast map provides an evidence base of coastal change in Scotland
	Flood Risk Management (Scotland) Act 2009 statutory requirements to produce a flood risk plan
	National Flood Risk Assessment (NFRA) 2018
	Property Flood Resilience Action Plan
	Water Resilient Places – A Policy Framework for Surface Water Management and Blue-Green Infrastructure
	Water Environment (Controlled Activities) (Scotland) Regulations 2011 includes installation of SUDs in new development
Regional	North East Flood Risk Management Plan
Aberdeen	North Beach Coastal Protection study
	Footdee Coastal Flood Study (2018)
	Aberdeen Strategic Overview of Coast Protection (2019)
	Aberdeen Beach & Coastal Defences Inspection Guidance
	Aberdeen Beach Bi-weekly Beach Level Inspection Guidance

4.2.4 Approach

Goals	
Manage and minimise flooding	
Increase in nature based solutions	
Protecting watercourses and coastline	
Objectives	**Measures**
i. Support grey and green flood protection measures, being delivered through the North East Flood Risk Management Plan.	Evidence of flood management measures No. of recorded flooding incidents
ii. Expand the use of blue green infrastructure in new development and regeneration.	

iii. Develop a shoreline management plan, building on existing studies, to protect people, places, nature and heritage at the coast.	Changes in the extent to flooding in relation to SEPA Flood Mapping. % increase blue-green infrastructure
iv. Strong catchment planning to help protect water quality and quantity, as well as reduce impacts from temperature, flooding and pollution on aquatic life.	

About the approach

i. Support grey and green flood protection measures, being delivered through the North East Flood Risk Management Plan.

- Where practical, improve drainage and reduce flood risk through the use of permeable, porous ground surfaces. Develop sustainable water management solutions, such as grey and green sustainable urban drainage systems (SUDs) and swales to reduce run off and help manage pollution.
- Encourage uptake of grey and increase of green sustainable urban drainage systems (SUDs), swales and raingardens to manage run off during heavy rainfall.
- Where appropriate, create space for water to ebb and flow during the seasons. Through flood plains, wetlands, de-culverting and buffer zones, so local rivers have space to adapt, protecting people and places from flooding.

ii. **Expand the use of blue green infrastructure in new development and regeneration**

- Identify areas suitable for installation and retrofit of blue green infrastructure, identifying blue-green infrastructure solutions appropriate to Aberdeen's climate and landscape. Aberdeen has a Sustainable Growth Agreement with SEPA and Scottish Water to map and identify areas suitable for blue green infrastructure (BGI).
- Expand installation of blue-green infrastructure and natural flood management in new development and regeneration.
- Create guidelines for blue-green infrastructure, to inform design, regeneration and retrofit.
- Increase the use of porous and permeable ground surfaces in new development and regeneration, to allow soils to soak up and filter rainfall and pollutants.

What is blue green infrastructure?
BGI includes deculverting, sustainable urban drainage systems, wetlands, flood alleviation areas, porous and permeable surfaces which can absorb rainfall and reduce flood risk through space for water to ebb and flow. Reducing run off through urban greening such as green roofs and walls as well as planting trees and vegetation to provide cooling, providing shade and shelter, helping to improve air quality, regulate urban temperature, reduce pollution and capture and store carbon.
Additional benefits from BGI include, supporting wildlife and connect habitats; creating space for leisure and recreation and contributing to health and wellbeing.

iii. Develop a shoreline management plan, building on existing studies, to protect people, places, nature and heritage at the coast.

- Large scale assessment of coastal risks and planning for future management, protection and coastal adaptation, building co-benefits for biodiversity, access and health and wellbeing.
- Support the development of natural coastal defences, to improve the resilience of vulnerable soft coastal areas to flooding and erosion. Incorporating measures such as, beach nourishment and dune restoration.
- Collaborate with key coastal partners to build understanding, inform decision making and help north east coastal areas to adapt.
- Support the delivery of the Integrated Coastal Zone Management**.**

iv. Strong catchment planning can help protect water quality and quantity, as well as reduce impacts from temperature, flooding and pollution on aquatic life.

- Investigate opportunities to re-introduce meanders to watercourses, where appropriate, to slow down water flow.
- Encourage sustainable river bank management, by planting trees and vegetation and using natural protection techniques such as willow spiling, to help prevent erosion.
- Maintaining catchment management with key partners.

4.2.5 Net Zero Aberdeen synergies

Blue, green infrastructure can reduce energy demand and providing shade and cooling helping the **Net Zero Aberdeen**, Buildings and Heat and Energy Supply themes. Low-carbon materials should be encouraged in new flood defences.

Appendix 2

4.3 Our natural environment

4.3.1 Priority

Monitoring for change, responding to pressures and adapting through nature, for a healthy and productive natural environment.

4.3.2 Key challenges for the natural environment

How will we:

1. **Reduce** habitat and wildlife loss.
2. **Reduce** fragmentation of habitats.
3. **Identify** any shift in wildlife numbers and distribution.
4. **Monitor** habitat health to enable quick response to new challenges, including early detection of pests and disease.
5. **Address** climate change alongside the twin crisis of biodiversity loss.
6. **Safeguard** Aberdeen's soils to bring benefits for nature, local growing and providing effective drainage.
7. **Reduce** soil erosion and degradation.
8. **Conserve** natural resources.

Aberdeen is working to meet the aspirations of the Edinburgh Biodiversity Declaration recognising the significant implications that the loss of biodiversity and climate change has on livelihood and communities.
The city has a Green Space Network connecting habitats, species and green spaces. Quantity and quality of open space in the city is identified in an Open Space Audit. Successful partnership work has taken a proactive approach to address wilful fire raising at the Gramps. The North East Scotland Biological Records Centre (NESBReC) are collating valuable data on species for the area. Collaborative partnership work through the North East Scotland Biodiversity Partnership (NESBiP) is helping to protect local biodiversity and involvement in the Dee Catchment Partnership allows us to do more for the River Dee higher up in the catchment to improve the river.

4.3.3 Drivers

International	Development of the post-2020 Global Biodiversity Framework
	Edinburgh Declaration on post 2020 global biodiversity
	Global Assessment on Biodiversity and Ecosystem Services
UK	UK State of Nature Report
	Marine Climate Change Impacts Partnership 2020 Report card
	State of the Uks Birds 2020
Scotland	Land Use: Getting the best from our Land: strategy 2021 to 2026
	Forestry and Land Management Act (Scotland) 2018
	Scottish Forestry Strategy 2019 – 2029
	River Basin Management Plan for Scotland 2021-2027
	Scotland's Biodiversity Strategy and Routemap to 2020

	Pollinator Strategy for Scotland 2017 – 2027
	Scottish Soil Framework (2009)
	Environment Strategy for Scotland
	Scotland's indicators – territorial insect abundance – butterflies
	Unlocking the potential of NHS Greenspace for health & wellbeing
	Scotland's National Marine Plan
Regional	Regional Land Use Partnerships to develop Regional Land Use Frameworks
	Dee Catchment Management Plan
Aberdeen	Local Outcome Improvement Plan, stretch outcome 15. Addressing the nature crisis by protecting/ managing 26% of Aberdeen's area for nature by 2026.
	Open Space Strategy
	Nature Conservation Strategy
	(Draft) Tree and Woodland Strategic Implementation Plan 2022-2025

4.3.4 Approach

Goals
Increased space for nature - green space connections and naturalised areas
Healthy & productive soils – effective drainage and supporting growth
Trees & woodlands: protected & enhanced – expand city tree and woodland cover

Objectives:	**Measures**
i. Assess vulnerability and establish processes to monitor local changes to biodiversity	% increase in tree canopy cover No. of days River Dee falls below Q95 low river flow. % increase blue-green infrastructure Number of SFRS hours responding to wildfire Aberdeen
ii. Review and strengthen local plans, policy and strategy, as we learn more about climate impacts for the natural environment.	
iii. Protect and expand Aberdeen's Green Space Network and increase naturalised areas, to improve habitat connections.	
iv. Assess the health of trees and woodlands, protecting and expanding Aberdeen's trees and woodlands, with the right tree in the right place.	
v. Encourage management and protection for soil during planning, development and construction processes, to maintain soil function, quality and stability.	

About the approach

i. **Assess vulnerability and establish processes to monitor local changes to biodiversity**

- Build an evidence base and mechanisms to identify local changes to biodiversity.

- Encourage citizen science initiatives to help spot any changes and to improve data on the local picture.
- Support work to tackle invasive non-native species (INNS).

ii. **Review and strengthen local plans, policy and strategy, as we learn more about climate impacts for the natural environment.**

- Explore opportunities to strengthen climate change in Aberdeen's plans and strategies, to reduce impacts on local wildlife and habitats.
- Raising awareness of ways to adapt vulnerable city greenspaces, including information on resilient gardens for city residents.

iii. Protect and expand Aberdeen's Green Space Network and increase naturalised areas, to improve habitat connections.

- Improve habitat connections and increase places for pollinators through naturalised green spaces, urban greening, making space for nature in urban areas from rooftops to verges.
- Identify and deliver sites to create naturalised grasslands and wildflower meadows across multiple land ownerships Increasing biodiversity, contributing to carbon stores.
- Integrate climate resilience in the management of Aberdeen's parks, gardens and greenspaces.

iv. Assess the health of trees and woodlands, protecting and expanding Aberdeen's trees and woodlands, with the right tree in the right place.

- Expand Aberdeen's tree cover at appropriate locations, planting a diversity of species, resilient to climate change, pests and disease.
- Increase uptake of measures such as wet woodland in river catchments and the use of riparian woodland buffers, to slow run off to rivers and catchments.
- Establish a programme to assess tree cover in Aberdeen and monitor the health and condition of city trees and woodlands.

v. Encourage management and protection for soil during planning, development and construction processes, to maintain soil function, quality and stability.

- Encourage the development of brownfield sites in Aberdeen, where appropriate, to help to reduce soil compaction and promote sustainable soil management in city development and construction to maintain soil function, quality and stability.
- Create good practice guidance and information on ways to improve soil management, for developers, land managers and those involved in food growing in the city.
- Encourage management and protection for soil during planning, development and construction processes, to maintain soil function, quality and stability.
- Increase the use of porous and permeable ground surfaces in new development and regeneration. This will allow soils to soak up and filter rainfall and pollutants; helping to reduce flood risk and water run off.
- Increase understanding of the need to retain permeable surfaces in Aberdeen to reduce risks of surface water flooding.

Appendix 2

4.3.5 Net Zero Aberdeen synergies

Natural environment aligns very closely with **Net Zero Aberdeen** through opportunities to protect and enhance carbon stores and increase nature based solutions.

4.4 Society and economy

4.4.1 Priority

Healthy, resilient communities and strong, robust business sectors, with the capacity and knowledge to adapt

4.4.2 Key challenges for Society and Economy

How will we:

1. **Inform** local resilience arrangements of the projected shocks and stresses from climate change.
2. **Ensure** people are not disadvantaged by climate change and inequalities widened, such as being unable to afford insurance or adaptation measures.
3. **Reduce** impact from climate change on people's physical and mental health.
4. **Reduce** disruption to the delivery of health and care services.
5. **Inform** communities and help them prepare for severe weather.
6. **Ensure** Aberdeen's health and social care services and facilities are informed and ready to respond to climate risks.
7. **Provide** safe places and connections with local services during extreme weather.
8. **Encourage** integration of climate in business resilience planning to avoid "lock in" of climate risks.
9. **Encourage** greater resilience to supply chains.
10. **Engage** those who depend on the health of the sea, for fishing and tourism, in the northward movement of cold-water marine species and rise in sea level.
11. **Increase** resilience in food growing spaces, so they remain productive and accessible.

The North of Scotland Resilience Partnership provide area wide oversight for resilience arrangements. Grampian Local Resilience Partnership is part of this and provides multi agency co-ordination for response and recovery in emergency situations, including severe weather. Category 1 & 2 emergency responders are set out in *Appendix 3*.
A City Resilience Group works to manage city risks which could cause an emergency affecting people and place. Climate is included on the agenda for this group.

4.4.3 Drivers

International	Economics of Climate Change - IPCC
UK	UK Independent Climate Risk Assessment (CCRA3): Business and Industry
	UK Independent Climate Risk Assessment (CCRA3): Health, Communities and the Built Environment
	Proposed National Resilience Strategy
Scotland	Overheating risk in buildings housing vulnerable people in Scotland (2018)
	NHS Scotland commitment - all Health Boards to prepare a Climate Change Risk Assessment and Climate Change Adaptation Plan

	NHS Standards for Organisational Resilience, include climate change.
	Draft NHS Scotland climate emergency and sustainability strategy 2022 to 2026
Regional	North of Scotland Resilience Partnership: Community Risk Register 2021
	Regional Economic Strategy
	NHS Grampian Facilities and Estates Strategic Delivery Plan
Aberdeen	Adaptation has been considered in Granite City Growing: Aberdeen Growing Food Together 2020 community food growing strategy.
	Aberdeen City Health & Social Care Partnership (ACHSCP) strategic plan
	Aberdeen City Care for People Plan
	Development of the Council Power Resilience Plan
	Local Outcome Improvement Plan - improvement aim for community led resilience plans in place for areas most vulnerable to flooding by 2023, leading to resilience plans in place across all areas of Aberdeen by 2026.

4.4.4 Approach

Goals	
Prepared and connected communities	
Health, wellbeing and climate justice	
Increased business resilience	
Increased food security	
Objectives	**Measures**
i. Work with Community Planning Partners and local communities to increase the number of community resilience plans in place in Aberdeen.	LOIP measure for increase in community resilience plans
ii. Develop a platform of support, information and learning, to build community capacity to prepare for severe weather.	No. people reached
iii. Inform health and social care providers on climate impacts for Aberdeen, to support local adaptation in this sector.	No. people reached
iv. Build understanding of the impact of climate change on key city business sectors and their supply chains and encourage forward planning around climate impacts.	No. of business resilience plans including adaptation
v. Build understanding of risks to the food sector and opportunities to incorporate climate adaptation measures in new and existing food growing sites.	Evidence of adaptation community food growing sites.

About the approach

i. Work with Community Planning Partners and local communities to increase the number of community resilience plans in place in Aberdeen.

- Support local communities to identify climate challenges and help the development of community resilience plans, to help cope with and recover from severe weather.
- Reduce risks for people disadvantaged in being able to prepare and respond to climate change or exposed for communities.
- Assess where people may be vulnerable to climate change and develop actions to help people prepare and respond.
- Identify pressures from climate change on contingency planning, where these may multiply known risks and create new ones.
- Continue to monitor the impacts of severe weather on Aberdeen.
- Inform people how to take precautions to reduce the risk and spread of wildfire.

ii. Develop a platform of support, information and learning, to build community capacity to prepare for severe weather.

- Highlight resources and information sources so local people know how to keep safe and are aware of the assistance available during and following severe weather.
- Increase awareness of the Local Resilience arrangements already in place.
- Investigate the development of community and remote working hubs.

iii. Inform health and social care providers on climate impacts for Aberdeen, to support local adaptation in this sector.

- Cascade information through resilience partnerships on any health impacts from climate change that could affect the city.
- Embed climate change in health and social care planning and in business continuity arrangements to help prepare for impacts on health and facilities.
- Increase understanding on the risks of overheating, from high indoor temperatures, especially within city health and social care facilities.
- Cascade information on climate risks to health including changes in disease, impacts on air quality.

Health and well-being outcomes are firmly linked with the success of actions for buildings and infrastructure. Around 26% of people aged 65 years and over in the city, with high care needs are cared for at home.

iv. Build understanding of the impact of climate change on key city business sectors and encourage forward planning on climate impacts.

- Increase understanding of the impact of climate change on key city business sectors, signposting to information on the local challenges and opportunities of climate change.
- Encourage and support the integration of climate adaptation in business resilience plans.

- Investigate options for business growth from through adaptation innovation, technology and skills development.

There are many interdependencies with the approaches for buildings, infrastructure, energy, food security, space for nature, water and soils

v. Build understanding of risks to the food sector and opportunities to incorporate climate adaptation measures in new and existing food growing sites.

- Adapting local growing sites, where practical improving drainage, including permeable surfaces, windbreaks, raised beds, effective soil management, rainwater collection and storage systems.
- Build understanding about climate impacts on local food crops, trialling different times for planting and a wider range of varieties and types of crop.
- Explore opportunities to link food growing to the development of green infrastructure, through use of vertical and roof spaces for food growing.
- Use of markets and food hubs to create a link for producers across the north east to sell their goods
- Raise awareness of the potential risks of climate change on food standards and quality; and promote food safety.

Adaptation is already considered in Granite City Growing, the city community food growing strategy. In 2021, Aberdeen became a signatory of the Glasgow Food and Climate Declaration, included in this commitment is pioneering integrated food policies and strategies at the local level to drive positive food system change and ensure greater resilience.

4.4.5 Net Zero Aberdeen synergies

This theme aligns with Net Zero Aberdeen in relation to opportunities for local food growing; as well as green jobs and skills development.

4.5 Building understanding

4.5.1 Priority

Increasing understanding of climate impacts, with local communities, businesses and organisations empowered to adapt.

4.5.2 Key challenges for Building Understanding

How will we:

1. **Address** gaps in adaptation research and knowledge.
2. **Encourage** research that builds knowledge of adaptation measures that work for Aberdeen.
3. **Build** organisation and citizen understanding of climate impacts for Aberdeen.
4. **Provide** information, on how to keep safe and where to go for assistance when severe weather hits.
5. **Get** people on board with the benefits of local adaptation action.
6. **Measure** participation.

Stakeholders

Communities	Build community resilience. Increase awareness and understanding. Citizen science projects.
Businesses	Improving business resilience. Opportunities for innovation, technology and skills development.
Public bodies	Protect critical infrastructure. Maintaining emergency response. Delivering climate duties. Safeguarding services.
Further education institutes	Developing research. Increasing learning. Testing application. Sharing good practice.
Schools	Support learning and research in adaptation. Citizen science projects.
Existing partnerships	Mainstreaming resilience. Cross agency liaison.

4.5.3 Approach

Goals	
Climate research - adaptation knowledge linked to local challenges	
Climate aware - understanding climate change impacts and the benefits of adaptation	
Objectives	**Measures**

i. Encourage research programmes to address adaptation gaps and build knowledge of adaptation measures that work for Aberdeen.	No. research initiatives
ii. Develop adaptation partnership placement opportunities for students.	No. of participants, students
iii. Encourage partners and volunteers through citizen science projects, to gather data on weather impacts and the local environment.	No. of participants, citizen science projects
iv. Increase the engagement of local communities, businesses, schools and organisations through an adaptation education and information campaign.	No. of people reached No. of case studies
v. Establish a resource of information on climate risks and impacts for the city and wider region.	No. of people accessing information

About the approach

i. Encourage research programmes to address adaptation gaps and build knowledge of adaptation measures that work for Aberdeen.

- Seek opportunities for co-operation and joint initiatives, making use of the knowledge and expertise between institutions including; University of Aberdeen, RGU and James Hutton Institute.
- Test local research in adaptation with cost effective, relevant, practical demonstration projects to help narrow the gap between adaptation research, local policy and practicalities.
- Learn from successful research and projects in other cities and regions and apply lesson learned to adaptation in Aberdeen.

ii. Develop adaptation partnership placement opportunities for students.

- Investigate options for student projects, placements and training.

iii. Encourage partners and volunteers through citizen science projects, to gather data on weather impacts and the local environment.

- Foster community input, through citizen science projects to help improve the range and quantity of data gathered to support adaptation in Aberdeen.

iv. Increase the engagement of local communities, businesses, schools and organisations through an adaptation education and information campaign.

- Develop and implement an engagement plan to help people understand the impacts of climate change for Aberdeen and what sectors can do to prepare.

- Involve young people in Aberdeen's adaptation journey, promoting local learning linked to the Curriculum for Excellence, including the EcoSchools programme; Climate Ready Place and Flood Education lesson plans.
- Link adaptation awareness to local events and initiatives, such as North East Climate Week.
- Explore opportunities to use art and cultural reflections to improve understanding of climate change and to encourage climate action.

v. Establish a resource of information on climate risks, impacts and adaptation actions for the city and wider region.

- Create an online information hub and signpost to available adaptation tools and resources that may be of benefit to city business, organisations and communities.
- Promote good practice and produce case study examples of successful local adaptation actions to share with local, national and international partners, to raise the profile of the city.

Net Zero Aberdeen synergies

This theme is relevant to **Net Zero Aberdeen** in relation to linking policy and research as well as activities to support organisation and citizen engagement and participation in climate change.

Glossary

Abstraction
The removal of water from any source, either permanently or temporarily.

Adaptation
The process of adjustment to actual or expected climate and its effects. In human systems, adaptation seeks to moderate or avoid harm or exploit beneficial opportunities.

Blue, green infrastructure
Green infrastructure covers a network of greenspaces and includes parks, playing fields, tree-lined streets, allotments, private gardens, river banks, wetlands and woodlands, as well as green roofs and artificial structures that include vegetation such as green walls, rain gardens and sustainable urban drainage systems. It can incorporate blue infrastructure including sustainable urban drainage, swales, wetlands, rivers and canals and their banks, and other water courses.

Bridge scour
Movement of riverbed sediment, associated with fast flowing water against bridge with footings in the river bed, damaging the bridge foundations.

Climate change
The Framework Convention on Climate Change (UNFCCC), defines climate change as: “a change of climate which is attributed directly or indirectly to human activity that alters the composition of the global atmosphere and which is in addition to natural climate variability observed over comparable time periods.”

Culvert
A culvert is a structure that allows water to flow under a road, railtrack, path, or similar obstruction from one side to the other side.

Fluvial flooding
Flooding of rivers and waterways, accumulation of water over areas that are not normally submerged.

Groundwater flooding
Rainfall increases natural water levels underground, this results in it rising to the surface causing flooding.

Invasive non-native species
Those that have been transported outside their natural range and that damage the environment, economy, our health and the way we live.

Riparian woodland
A wooded area of land adjacent to a water course.

Soil compaction
Compressing soil particles, reducing space for air and water.

Soil sealing

Covering soil in impermeable materials such as concrete or asphalt.

Storm surge
Weather and tidal conditions increase sea levels which can lead to significant coastal inundation. A temporary increase in the height of the sea due to extreme meteorological conditions (low atmospheric pressure and/ or strong winds). Excess above the level expected from tidal variation alone at that time.

Surface water flooding
Occurs when an extremely heavy downpour of rain saturates the urban drainage system and the excess water cannot be absorbed.

Sustainable Urban Drainage Systems (SUDS) Water management systems to drain and manage water in a more sustainable way, lessening the risk of flooding by slowing down run off. The term SUDS can cover permeable surfaces, filter and infiltration trenches, swales; detention basins, raingardens, wetlands and ponds.

Swales
Can refer to a natural landscape feature or one designed to manage water run-off.

Urban Heat Island Effect
Defined as a city area significantly warmer than the rural surrounding area, the heat stored in buildings and the ground. The temperature difference is usually greater at night than during the day.

Appendix 1

Monitoring Framework

Climate risks

Place based climate risks affecting the region will be monitored and the **Evidence Base** for Aberdeen Adapts updated to take into account:

- National information including, but not limited, to UK Climate Projections and the UK Climate Risk Assessment (produced every 5 years).
- Information gathered through local studies and climate impact assessments for Aberdeen Adapts.
- Information from relevant monitoring and inspection regimes.

Weather impacts

Severe weather events affecting the city will be monitored and a summary weather impacts report for the city produced every 5 years as a minimum. This is to help understand any areas of current vulnerability to the weather and the need for additional or reprioritised actions.

Indicators relevant to adaptation

Where relevant, Aberdeen Adapts will link to existing city place based outcomes. Additional indicators will be added as the Implementation Plan is developed and new data becomes available.

	Relevant measures/ indicators	Source
1	Building condition and disrepair (Aberdeen)	Scottish House Condition Survey
2	Uptake of property level protection measure	Aberdeen City Council
3	Evidence of flood management measures	
4	No. recorded flooding incidents Aberdeen	
5	Changes in the extent to flooding	SEPA Flood Mapping
6	% increase in city tree canopy cover	
7	Number of days River Dee falls below Q95	SEPA
8	% increase blue-green infrastructure	
9	No. SFRS hours responding to wildfire Aberdeen	Scottish Fire & Rescue Service
10	No. of community resilience plans	LOIP
11	No. of business resilience plans	
12	No. of community food growing sites	Granite City Growing

Appendix 2

Aligning Aberdeen Adapts with the UN Sustainable Development Goals

- **Buildings and infrastructure** contributes to SD goals of sustainable cities and communities, affordable and clean energy, clean water and sanitation, industry, innovation and infrastructure.
- **Managing flooding and coastal change** contributes to SD goals of: sustainable cities and communities.
- **Our natural environment** contributes to SD goals of: life below water, life on land.
- **Society and economy** contributes to SD goals of: zero hunger, good health and well being, reduced inequalities, decent work and economic growth, industry, innovation and infrastructure, sustainable cities and communities, responsible consumption and production.
- **Building understanding** contributes to SD goals of: sustainable cities and communities, quality education.
- Collaborative working on Aberdeen Adapts contributes to SD goals of: partnerships for the goal.

Supporting the National Performance Framework

- We value, enjoy, protect and enhance our environment.
- We are healthy and active.
- We live in communities that are inclusive, empowered, resilient and safe.
- We have thriving and innovative businesses, with quality jobs and fair work for everyone.
- We are well educated, skilled and able to contribute to society.

Appendix 3

Category 1 and 2 Responders

The Civil Contingencies Act 2004 places statutory obligations on key organisations to prepare for, respond to and recover from major emergencies. Events or situations which threaten serious damage to people or place.

Category 1 Responders, defined as:

- Local Authorities
- Police Scotland
- Scottish Fire and Rescue Service
- Scottish Ambulance Service
- National Health Service Grampian
- Maritime Coastguard Agency (MCA)
- Scottish Environmental Protection Agency.

Duties:

- to assess risk.
- to maintain emergency plans.
- to maintain business continuity plans.
- to promote business continuity.
- to communicate with the public.
- to share information to co-operate.

Category 2 Responders defined as:

- Electricity Operators
- Gas Suppliers
- Scottish Water
- Communications Providers
- Railway Operators
- Airport Operators
- Harbour Authorities
- NHS National Services Scotland
- Health and Safety Executive

Duties:

co-operate with Category 1 responders in connection with the performance of their duties, includes sharing of information.

The **North of Scotland Resilience Partnership** (Tayside, Grampian, Highland and Islands) provides a strategic forum for the co-ordination of emergency planning and response.

Multi agency response to emergency situations in Grampian is co-ordinated through the **Local Resilience Partnership**.

Aberdeen Adapts can support these response and recovery resilience arrangements through helping to prevent and prepare for pressures from increases in severe weather events.

Appendix 2

References

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