



From mountain to sea

# Local Climate Impact Profile (LCLIP) 2019 - 2022

Final Version

February 2024



## Foreword

### Alan Wood, Director of Environment and Infrastructure Services

Scotland's climate is changing. Temperatures are increasing and extreme weather events are becoming more frequent across the country and Aberdeenshire, impacting people, businesses, the environment, and Aberdeenshire Council.

As a Council we are working hard to reduce our carbon footprint and our impact on the climate and environment, but we also have a crucial role to play in enabling our region to adapt to climate change and extreme weather events and increase our resilience to their impacts. This means shifting the focus from reacting to these events to adapting and preparing for them. To do this we need to look at future weather projections and at the impact of past weather events to identify and manage risks, bring forward policy responses and embed these into plans, policies, and service delivery.

Our Route Map 2030 and Beyond has already identified a need to address and improve climate change adaptation performance, to benefit our employees and residents of Aberdeenshire, but also to continue to fulfil our legislative duty to act and report on our progress to adapt and build resilience.

This Local Climate Impact Profile report emphasises the importance of climate change adaptation and resilience by highlighting the real-life consequences of extreme weather events on Aberdeenshire Council and its communities in recent years.

The findings and recommendations within this report will help Aberdeenshire Council look ahead and work together to prepare our services and our region for future weather events.



***“As a Council we have a crucial role to play in enabling our region to adapt to climate change and extreme weather events and increase our resilience to their impacts.”***

*Alan Wood*

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## Acknowledgements

The Sustainability & Climate Change team would like to thank all Aberdeenshire Council employees who took the time to complete the Climate Change Adaptation and Resilience Questionnaire, those who took the time to participate in a Climate Change Adaptation and Resilience interview and those who shared photographs and their personal experiences of working and living in Aberdeenshire during the extreme weather events of the last few years. Thank you also to colleagues from across the Council for sharing information and data from your service. Your contributions have been invaluable to the development of this Local Climate Impact Profile report.

The Aberdeenshire Council leadership team would also like to thank all members of staff for their hard work, dedication and going the extra mile for their colleagues, service users and the residents of Aberdeenshire when faced with the challenges of responding to and recovering from severe and unexpected weather events and a changing climate.



*Ballater, Aberdeenshire*

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**Visit [aberdeenshire.gov.uk](https://www.aberdeenshire.gov.uk)**

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## Executive Summary

Between 1<sup>st</sup> January 2019 and 31<sup>st</sup> December 2022, Aberdeenshire Council was affected by 51 weather events, including extreme low temperatures with snow and ice, extreme high temperatures and heatwaves, excessive rainfall events, high winds, and storms.

The main impacts to Aberdeenshire Council because of these were damage to Council buildings, housing stock, infrastructure, land, vegetation and local ecosystems and biodiversity; disruption to and an increase in demand for services; risks to employees and public health and wellbeing; and an increase in engagement and support to communities.

The total financial cost of these events has not been calculated; however, the estimated cost of the storms alone stands at approximately £1.075 million. As this figure was below the 1% threshold (£1.2 million) set by Scottish Government there was no additional funding made available to the Council from the Bellwin Scheme. The Council therefore had to absorb the cost of the storms with no extra financial support.

These figures, and the results behind them, emphasise the importance of identifying Aberdeenshire Council's vulnerabilities to weather events and using these to prepare for a longer-term adaptation and resilience programme to minimise the expense and damage of future weather events.

The Aberdeenshire Council Sustainability and Climate Change team has used a Local Climate Impacts Profile (LCLIP) to look at how extreme weather events have affected people, the environment, and Aberdeenshire Council services between 2019 and 2022.

Its purpose is to develop a story for Aberdeenshire Council employees, elected members, the public and other Council stakeholders, to raise awareness of the impact of weather events and the need to adapt and build resilience to these. This LCLIP report will also consolidate existing evidence to provide an evidence base for future climate change adaptation and resilience actions and provide recommendations for improving the preparedness of Aberdeenshire Council to future weather events.

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# 1 Introduction

The Local Climate Impact Profile (LCLIP) Report 2019 - 2022 is the first step in Aberdeenshire Council's climate change adaptation and resilience programme.

## 1.1 What is an LCLIP and Definitions

The LCLIP tool was developed by the UK Climate Impacts Programme (UKCIP) to assist local authorities and organisations to assess their exposure and vulnerability to past weather events, as a step towards preparing for future risks. An LCLIP considers the effects of weather events now and in the recent past. It is important to note that an LCLIP does not consider the consequences of climate change.

- **Climate** refers to the average weather conditions in a particular place over a long period of time. **Climate change** refers to long-term changes to these conditions. For example, rising temperatures.
- **Weather events** refer to short term atmospheric conditions in a particular place. For example, storms, rain, snow, etc.
- **Extreme weather events** are weather events which are unusual or unexpected. These can be severe or unseasonal and have an impact on the place they occur. For example, extreme hot and cold temperatures, excessive rainfall, high winds, etc.

For further information about Local Climate Impact Profiles, please see the [UKCIP website](#).

## 1.2 Purpose of this LCLIP

The purpose of this LCLIP is:

- To develop a story and raise awareness of the impact of weather events and the need to adapt and build resilience to these.
- To consolidate existing evidence to provide an evidence base for future actions.
- To provide recommendations for improving the preparedness of Aberdeenshire Council.

The LCLIP's primary audience is Aberdeenshire Council elected members and employees, the public and other council stakeholders. This report should be used primarily as a communication tool to raise awareness of vulnerability and resilience across Aberdeenshire Council.

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The outputs of the LCLIP are:

- This report.
- One-page synopsis of LCLIP findings for the primary audience.
- Presentation to the Aberdeenshire Council Sustainability Committee.

The LCLIP will be used:

- To identify potential adaptation opportunities.
- To identify future climate change risks and contribute to the Aberdeenshire Council Climate Change Risk Register.
- To prepare for a longer-term adaptation programme, including an Employee Adaptation & Resilience Guidance document.
- To be used alongside the Council's Adaptation Scotland Capability Benchmarking Framework and Public Bodies Climate Change Duties Reporting.

The context of the LCLIP within Aberdeenshire Council is as an update to previous LCLIPs. The Council's first [LCLIP](#) was released in 2011 and was based on weather events and impacts between 2000 and 2010. This was followed up in 2019 by a second [LCLIP](#) covering weather events and impacts between 2011 and 2018 with key recommendations. This report will provide an update on the progress of these recommendations and provide further recommendations.

The scope of the LCLIP is the geographical area of Aberdeenshire and the timeframe covered is 1<sup>st</sup> January 2019 to 31<sup>st</sup> December 2022. The shorter timescale of this LCLIP is due to the amount of extreme weather events within this period. This report will detail how weather events within this timeframe have affected people, the environment, and Aberdeenshire Council services.

The LCLIP was completed by a member of Sustainability and Climate Change Team based within Environment and Infrastructure Directorate.

In addition to covering a shorter period, this LCLIP differs from previous LCLIPs in that it overlaps with three major global events.

- United Kingdom's withdrawal from the European Union
  - COVID-19 Pandemic
  - Russia's invasion of Ukraine
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Each of these has had a significant impact on Aberdeenshire, including the consequences of extreme weather events in the region and the Council's ability to respond. These impacts include:

- Increase in cost of living.
- Increase in energy prices.
- Increase in cost of external services, contractors, and materials.
- Reduced funding.
- Delays to projects.
- Recruitment and staff retention challenges.
- Increase in demand for some Council services.
- Significant changes in how services were delivered.

### 1.3 United Kingdom withdrawal from the European Union

In January 2020, the UK withdrew from the European Union (EU). This saw restrictions to trade, an increase in the cost of living including food and energy bills, an increase in business costs, difficulties with recruitment and staff retention, changes to standards and policies, and the loss of EU funding.

Leaving the EU influenced Aberdeenshire Council recruitment, procurement, supply chains and project funding due to the loss of EU funds. Services also saw an increase in the cost of external services, contractors, and materials, which impacted their ability to respond to weather events and make repairs or improvements to increase weather resilience. Examples of this include the increased cost of water sampling and cost of materials for infrastructure improvements.

### 1.4 Impact of COVID-19 Pandemic

The COVID-19 pandemic in the United Kingdom came into effect from early 2020. The resulting lockdown restricted travel and other activities, all non-essential shops and retailers were closed, social distancing was introduced, and employees worked from home where they could.

With regards to the consequences of extreme weather events, there were some positives to pandemic restrictions; people not working or working from home and travel restrictions resulted in less people on the roads and using public transport. This meant fewer people were impacted by the consequences of extreme weather events such as flooded and blocked roads and rail lines.

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However, there were negative consequences. Travel restrictions, social distancing and procedures put in place to protect employees and service users made it difficult for services to respond to weather events, including clearing roads and reaching those affected. Working from home posed its own weather-related challenges as many homes were not as equipped for extreme heat and cold as some Council offices and reliance on ICT when working from home meant many employees were unable to work when their networks or power supplies were affected by weather. More people at home also increased the demand on private water supplies, causing additional water testing and increasing the risk of water shortages during heatwaves and periods of drought.

Travel restrictions to other countries meant more people were visiting outdoor spaces in Aberdeenshire, which although was positive for health and wellbeing, led to an increase in littering, damage to land and an increase in wildfire risks due to inappropriate camping and BBQs. A risk that was increased by high temperatures and heatwaves.

## 1.5 Russia's invasion of Ukraine

In February 2022, Russia invaded Ukraine. The invasion had worldwide repercussions to the environment and the economy and led to one of the worst refugee crises in recent history. By May 2023 more than 8.2 million people had fled Ukraine and were welcomed to countries throughout the world, including Scotland.

The invasion also had a profound effect on global energy markets leading to a substantial increase in the cost of oil and gas. This in turn has led to a further increase in the cost of external services, contractors, and materials, with some Council employees estimating a 30 – 50% increase in costs in 2022. With regards to weather events, this has caused a delay in some services responding to events or completing projects which would build resilience to these extreme weather events.

## 1.6 Aberdeenshire

Aberdeenshire is a predominantly rural area in North East Scotland of approximately 6,339km<sup>2</sup>, representing 8% of Scotland's overall territory and includes the mountainous Cairngorm National Park, rich agricultural lowlands and varied coastal landscapes. In 2022, Aberdeenshire's population had risen by 4% since 2010 to 260,780 making up around 5% of the Scottish population. 20% of the region's population are over 65 years of age, an increase of 4% since 2010.

There are 62 towns and villages in Aberdeenshire with a population greater than 500 and six towns with a population greater than 10,000.

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Housing stock within Aberdeenshire has risen by 9% to 120,140 since 2010 and accounts for 5% of Scotland's total household stock. Due to the large and rural nature of the region, many of these houses are out with the mains gas network, relying largely on oil and gas for heating and 8,000 have private water supplies not provided by Scottish Water.

Aberdeenshire's economy is closely linked to Aberdeen City and the energy industry but is also dependent on agriculture, forestry, fishing, and tourism. The region's diverse and rich built heritage is reflected in its 3,500 structures and 41 Conservation Area designations, and its natural heritage is represented by its numerous Special Protection Areas, Special Areas of Conservation, Sites of Special Scientific Interest, 2 Local Nature Reserves, 9 National Nature Reserves and one National Park. Aberdeenshire also has over 4,000 kilometres of watercourse and approximately 200 kilometres of coastline which includes 7 harbours.

The geography, industries and dispersed population of Aberdeenshire mean it is reliant on its supporting infrastructure of 5,640 km of roads and over 1,300 bridges, which are maintained by Aberdeenshire Council. This infrastructure and other characteristics mean Aberdeenshire is vulnerable to the [15 key consequences of climate change](#), which Aberdeenshire Council has a duty to identify and mitigate.

Aberdeenshire Council is Aberdeenshire's local authority with 10,360 full time equivalent (FTE) employees as of November 2022, spread across 4 Directorates and working in community halls, depots, libraries, offices, parks and open spaces, schools, arts, and museum locations, including an aquarium, and sports and physical activity locations across the region. Since the COVID-19 pandemic, some of Aberdeenshire Council's employees are predominately home-based.

Under the Climate Change (Scotland) Act 2009 Aberdeenshire Council has a legislative duty to deliver its services in a way best calculated to deliver any statutory adaptation programme and report on this annually through the Public Bodies Climate Change Duties Report. To help deliver this, we need to assess Aberdeenshire's vulnerability to climate change and weather events which will be partly achieved through this LCLIP report.

Other adaptation legislation which Aberdeenshire Council must adhere to includes, but is not restricted to:

- Planning (Scotland) Act 2006, under which Aberdeenshire Council has a statutory duty to include adaptation in spatial and development planning, recognising the varying climate impacts across different locations and communities.
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- Marine (Scotland) Act 2020, under which Aberdeenshire Council has a statutory duty to protect and enhance the natural marine environment, recognising the impact changing weather has had and will continue to have on marine ecosystems.
- Flood Risk Management (Scotland) Act 2009, under which Aberdeenshire Council has a statutory duty to manage flood risk and promote sustainable flood management. Under this act, Aberdeenshire Council is the lead Local Authority for the North East Local Plan District, publishing the Flood Risk Management Plan 2016 and 2022.

For further information on the Climate Change (Scotland) Act 2009 and public sector duties, please see [Scottish Government Climate Change](#) and [Adaptation Scotland Legislation and international agreements](#).



*Fowlsheugh Nature Reserve, Stonehaven*

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## 2 Methodology

The 2019 - 2022 LCLIP was completed using the suggested methodology from the UKCIP's online LCLIP pack for local authorities and UKCIP 2009. A local climate impacts profile: how to do an LCLIP.

There were four stages in the completion of the LCLIP:

1. Project Planning
2. Data Collection
3. Data Analysis
4. Outcomes and agenda for further action

### 2.1 Project Planning

The Project Planning stage was used to define and agree the following:

1. Purpose of the LCLIP
2. Primary audience
3. Outputs
4. How it will be used/outcomes
5. Context
6. Scope
7. Who will complete the LCLIP
8. How data will be collected and analysed
9. Any constraints to the completion of the LCLIP and how to mitigate these

Please see section 1.2 and below for details of these.

### 2.2 Data Collection

The data collection stage comprised of:

- A **media trawl** of extreme weather events in the region of Aberdeenshire between 1<sup>st</sup> January 2019 and 31<sup>st</sup> December 2022.
  - **UKCIP**, **Climate Change Committee** (CCC) and **Met Office** data.
  - Data collected through the completion of **Aberdeenshire Council's Adaptation Scotland Capability Benchmarking Framework submissions** between 2019 and 2022. The framework allows the Council to measure its capability to deliver climate change adaptation through effective leadership, governance, planning and collaboration, and improve on this.
  - Data collected through the completion of **Aberdeenshire Council's annual Public Bodies Duties Climate Change Reports** between 2019 and 2022. As a public sector body, Aberdeenshire Council is required to report annually on
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compliance with climate duties established within the Climate Change (Scotland) Act 2009, which includes climate change adaptation duties.

- Information from **Aberdeenshire Council's [Bellwin Scheme 2021 - 2022 and 2023 - 2024 Reports](#)**. This scheme allows local authorities to apply for additional support to assist with immediate and unforeseen costs in dealing with the aftermath of emergency incidents, including extreme weather events. Bellwin reports give an indication of the financial costs of these events to Aberdeenshire Council.
- **Employee Climate Change Adaptation and Resilience Questionnaire** was disseminated to all Aberdeenshire Council employees in February 2023. The purpose of this was to discover how Council services have been impacted by extreme weather events, their level of knowledge and awareness of these events and what actions are already taking place. A link to the online questionnaire was sent to all employees via email to Service Managers and Sustainability Champions for dissemination to their teams and networks, through service newsletters and via Aberdeenshire Council's online collaboration tool Microsoft Yammer. It was completed by **74** employees from a range of services, employee levels and Council locations.
- **Climate Change Adaptation and Resilience Interviews** with Aberdeenshire Council employees in March 2023. These were a follow-up to the questionnaire and to establish links between the strategic and operational priorities of different services and weather impacts. The Sustainability & Climate Change Officer interviewed **14** employees from a range of services, employee levels and Council locations.

## 2.3 Data Analysis

The data collected was collated and analysed using tools provided by the UKCIP LCLIP guidance document. This included the [LCLIP spreadsheet template](#) to record weather events details.

## 2.4 Outcomes and Agenda for further Action

The main outcomes from the LCLIP are:

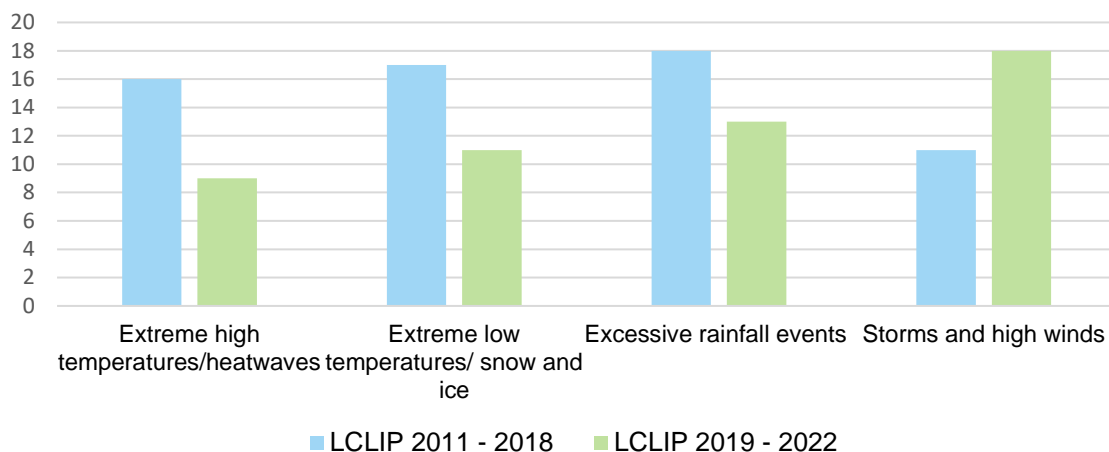
1. **Recommendations** for how Aberdeenshire Council can prioritise adaptation and resilience issues and risks.
  2. **Recommendations** for how Aberdeenshire Council and its employees can increase their preparedness for extreme weather events.
  3. **Tools** for sharing the outcomes and recommendations of the LCLIP with Aberdeenshire Council employees and elected members.
  4. **Tools** for sharing the outcomes and recommendations of the LCLIP with the public and other stakeholders.
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### 3 Results

2019 to 2022 saw more extreme weather events per year than the previous LCLIP period of 2012 to 2018. This is consistent with Scotland's changing weather patterns and the Met Office has predicted that these types of weather events are likely to continue and intensify.

The table below shows there were 16 incidents of extreme high temperatures, 17 incidents of extreme low temperatures, 18 excessive rainfall events and 11 storms and high winds between 2011 and 2018. In comparison there were 9 extreme high temperatures, 11 extreme low temperatures, 13 excessive rainfall events and 18 storms and high winds between 2019 and 2022.

*Table.1 Comparison 2011 – 2018 and 2019 – 2022 weather events in Aberdeenshire*



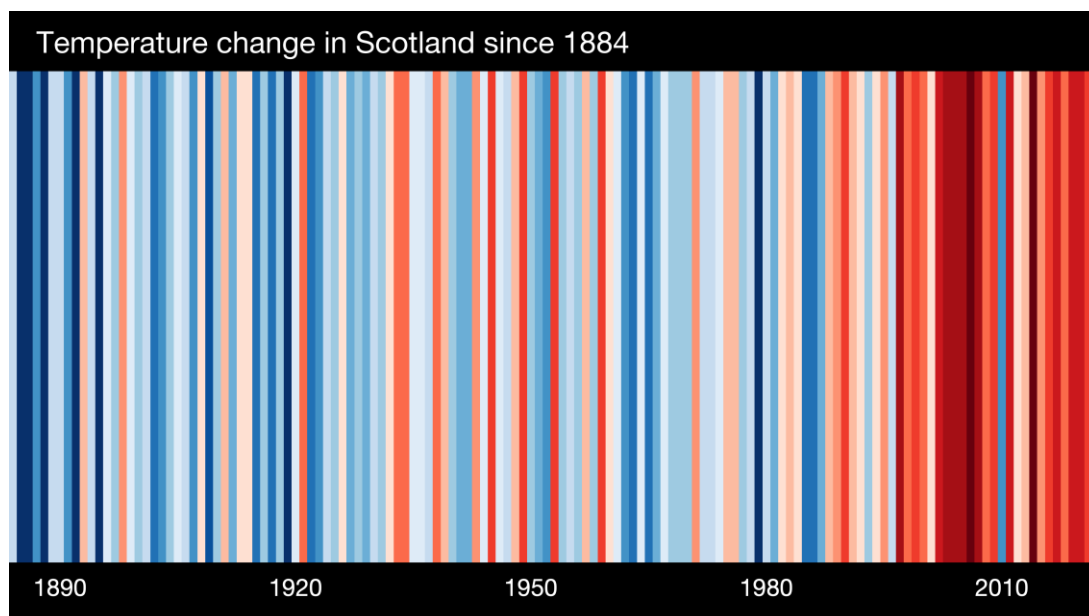
#### 3.1 Scotland's Weather

Scotland's weather is changing. Over the past few decades, the country has experienced changes in its climate and weather patterns, including more frequent and more extreme weather events. The climate is warming with our hottest days getting hotter, rainfall patterns have changed causing our wettest days to get wetter and our sea-levels are rising.

**Rainfall:** Rainfall has increased in Scotland, particularly during the winter months, and extreme weather events and storms have become more frequent leading to an increase in surface and coastal flooding in many areas. The annual average rainfall from 2010-2019 was 9% wetter than the 1961-1990 average, with winters being 19% wetter according to the Met Office.

**Sea level rise:** Nearly a fifth of Scotland's coastline is at risk of erosion and the effects of climate change and weather events. Mean sea levels around Scotland have risen by approximately 1.4 mm a year from the start of the 20th century.

**Temperature:** Scotland has generally seen an increase in average temperatures over the past century. Winters have become milder, and summers have become warmer. The country's top 10 warmest years since 1884 have occurred since 1997 with 2022 being Scotland's warmest year on record.



*Climate Stripes showing the global temperature change in Scotland*

According to the [UK Climate Projections 2018 \(UKCP18\)](#), these changes in Scotland's weather patterns are projected to continue and intensify with their consequences becoming more likely.

These projections include:

- Average temperatures will increase across all seasons.
- Typical summers will be warmer and drier.
- Typical winters will be milder and wetter.
- Intense, heavy rainfall events will increase in both winter and summer.
- Sea levels will rise.
- There will be reduced frost and snowfall.
- Weather will remain variable and may become more variable.

For further information on these changes, see Adaptation Scotland's [summary of the UK Climate Projections for Scotland](#)

Scotland and Aberdeenshire are already experiencing the social, economic, and environmental consequences of these changes, including their impact on property and infrastructure, water and food supplies, biodiversity, and the delivery of health, social care, and other essential services.

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The Scottish Climate Change Adaptation Programme has identified 15 key consequences of climate change for Scotland, many of which have already been experienced in Aberdeenshire.

1. The productivity of our agriculture and forests.
2. The occurrence of pests and disease.
3. The quality of our soils.
4. The health of our natural environment.
5. The security of our food supply.
6. The availability and quality of water.
7. The increased risk of flooding.
8. The change in our coast.
9. The health of our marine environment.
10. The resilience of our businesses.
11. The health and well-being of people.
12. Our cultural heritage and identity.
13. The security and efficiency of our energy supply.
14. The performance of our business.
15. Infrastructure network connectivity and interdependencies.

For further information on these, please see [Adaptation Scotland's Impacts in Scotland](#).

### 3.2 Aberdeenshire's Weather

Below is a summary of extreme weather events within and impacting Aberdeenshire between 1<sup>st</sup> January 2019 and 31<sup>st</sup> December 2022. Please note, these do not include every weather event in Scotland, only those which had an impact on Aberdeenshire.

Summary of weather events between 1<sup>st</sup> January 2019 and 31<sup>st</sup> January 2022:



**9** Extreme high temperatures/heatwaves



**11** Extreme low temperatures/ snow and ice



**13** Excessive rainfall events



**18** Storms and high winds

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**2019** was a year of extremes across Aberdeenshire, from record low temperatures to record highs and heatwaves



January: The year began with the coldest January on record for 7 years with a temperature of **-14.3°C** in Braemar and one of driest Januarys on record.

February: Storm Erik hit Aberdeenshire with heavy rain and windspeeds of up to **78mph** causing widespread flooding, damage, and disruption. Conversely this month also set a record for the highest February temperature in Scotland by reaching **19.3°C** in Aboyne.



March: Storms Freya and Gareth brought heavy rain and strong winds to Aberdeenshire, although the impact on the region was less than that of the rest of Scotland.

April: Aberdeenshire experienced **50mph** winds, heavy rain and a yellow thunderstorm warning as Storm Hannah arrived.



July: Despite heatwaves and high temperatures in July causing droughts in some areas, the summer of 2019 was also the **second wettest summer** on record with thunderstorms and a yellow weather warning across Aberdeenshire.



December: The year ended with unseasonably high temperatures, particularly overnight, with an average monthly temperature of **7.5°C**.



*River Dee in Ballater in July 2019*



**2020** was one of the five hottest years on record and top ten wettest and top ten sunniest years in the UK with Aberdeenshire experiencing all these extremes.



January: The year began with a yellow warning for wintry showers and wind due to Storm Brendan. Although Aberdeenshire wasn't affected as much as other parts of Scotland, the unusual combination of storm surge and naturally high tides led to high tide risks in the region, including Stonehaven.

February: The 2019 - 2020 storm season continued with Storms Ciara and Dennis just a week apart bringing heavy rains and winds of up to **80mph**. Storm Dennis in particular caused flooding and travel disruption.



April: Warm and dry weather following a relatively dry winter led to water shortages across the region. Aberdeenshire Council and Scottish Water provided support to users of private water supplies experiencing water shortages, however the COVID-19 pandemic and its restrictions made this more challenging than in previous years where this support was provided.



July: Flooding after a spate of heavy thunderstorms resulted in road closures and damage to businesses in Inverurie and Garioch Heritage Centre.

August 2020: Storm Francis, torrential downpours and thunderstorms caused flash-flooding and disruption to the south of Aberdeenshire, particularly in Stonehaven and caused a landslip which contributed to the Stonehaven derailment.



October: The month began with heavy rain and Aberdeenshire was one of many regions in the UK to record its **wettest October day** with **66.6mm** of daily rainfall. The month ended with further rain and high winds as Storm Aidan hit Aberdeenshire. Although the region wasn't as heavily impacted as other regions in Scotland, the south of Aberdeenshire did experience heavy rain.



*Flooded grounds of Garioch Heritage Centre in July 2020*

**2021** saw more average temperatures than 2020 but Aberdeenshire still managed to break some records. The year started and ended with heavy rain and storms including Storm Arwen, one of the most severe storms to hit Aberdeenshire.



January: The year began with heavy rains causing flooding in some areas of Aberdeenshire and causing damage to Turriff United's pitch and stadium. Mid-January also saw the arrival of Storm Christoph which brought wintry showers and heavy snow.

February: Storm Darcy caused the UK and Aberdeenshire's most severe spell of winter weather since the 'Beast from the East' in 2018. There was heavy and persistent snow showers and daytime temperatures struggled to rise above freezing with overnight temperatures of **-10°C to -15°C**. Braemar recorded the **UK's lowest temperature** since 1995 at **-23°C**



March – April: An exceptionally warm end of March was followed by an exceptionally cold April with wintry showers, frost, and snow with Oyne recording **5cm of snow** overnight.



July: Heatwaves saw the **first ever amber extreme heat warning** issued by the Met Office and led to an increased demand for water and concern about wildfires. Conversely the month ended with heavy rain which caused flooding across Aberdeenshire resulting in homes being evacuated in Portsoy.



November: A Met Office red wind warning was issued for Storm Arwen which brought severe **90mph** winds, and heavy rain and flooding across Aberdeenshire. There was substantial loss of tree cover, structural damage to properties and infrastructure, and thousands of homes were left without power.



December: Less than 2 weeks after Arwen, Storm Barra hit Aberdeenshire with **80mph** winds causing further structural and tree damage. The year ended with an exceptionally mild December and New Year with temperatures of between **6°C and 8°C** higher than average for that time of year.

**2022** began with several storms but became Scotland's hottest year on record with an average temperature of 8.5C, beating the previous record of 8.43C in 2014.



January: Storms Malik and Corrie arrived with less than 24 hours between them bringing high winds which caused extensive loss of tree cover, structural damage and road closures and the loss of power to thousands of homes across Aberdeenshire. Nearly a third of Aberdeenshire's schools were closed, including Banff Academy due to external roof damage after high winds.

February: The 2021/22 storm season continued with Storms Dudley, Eunice, and Franklin, all of which caused further structural damage with Eunice being the second storm after Arwen to be issued with a red warning for high winds. Eunice also resulted in heavy snow in the region.



March: Heavy snowfall and blizzard conditions led to travel disruption and school closures as some areas saw between four and six inches of snow fall.



June: A period of prolonged rainfall resulted in localised flooding and landslides.

July: Heatwaves hit Aberdeenshire again with temperatures reaching **31.3°C** in Aboyne. The Met Office issued a **red extreme heat warning**, and SEPA, Scottish Water, NHS Grampian and the Scottish Fire and Rescue Service issued warnings and advice regarding water usage, fire risks and heat risks to health.



November: Heavy rain again caused flooding in Aberdeenshire with SEPA escalating their flood warning to severe. Huntly was impacted heavily by the rain and the rising River Deveron which flooded the outdoor spaces of the Huntly Nordic Centre, and Kintore, Inverurie, Stonehaven, Portlethen and Hatton of Fintray were all affected by power cuts.



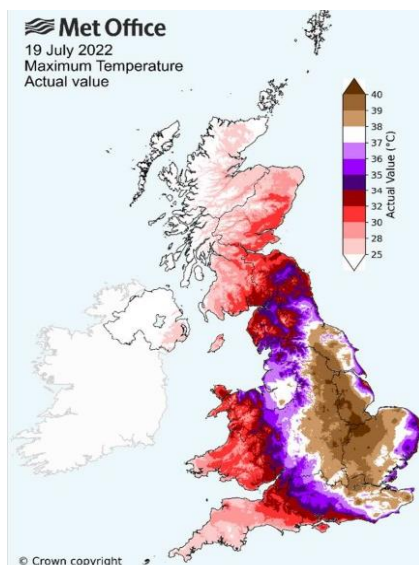
December: The year ended with snow, prolonged low temperatures and hard frosts lasting for over a week with Braemar recording the UK's lowest daily minimum temperature of **-17.3°C**.

### 3.3 Case Studies

The case studies below were selected based on the media coverage they received, mentions in responses to the Employee Climate Change Resilience and Adaptation questionnaire and interviews and their impact on Aberdeenshire Council.

#### 3.3.1 Heatwaves 2019 – 2022

In Scotland, a heatwave is a period of at least three consecutive days with daily temperatures exceeding 25°C. Annual heatwaves with temperatures well above this took place between 2019 and 2022, posing risks to human health, ecosystems, and infrastructure. In 2022 alone, Aboyne broke the record twice for Aberdeenshire's highest temperature.



These conditions were extremely challenging for Aberdeenshire Council as some services saw an increase in demand and there were concerns over employee health and safety. Droughts led to private water supplies maintained by Aberdeenshire Council running dry, increasing demand for water system maintenance and emergency supplies to communities. High temperatures in Council buildings and offices affected employee wellbeing, and although some buildings were equipped with air conditioning and cooling systems, many employees had to work from home due to pandemic restrictions causing concern over the heat in employee homes which are not designed for high temperatures. There were also health risks to front line workers working outside and travelling in high temperatures.

The Aberdeenshire Health & Social Care Partnership (AHSCP) faced additional challenges due to the impact of the heatwaves on human health, particularly to vulnerable populations such as the elderly, children, and individuals with pre-existing conditions. High temperatures caused care homes and schools to overheat affecting the health and wellbeing of residents, pupils, and staff leading to a rise in heat-related illnesses such as heatstroke and dehydration.

The region's native biodiversity struggled to adapt to the hotter and drier conditions and the lack of water increased the risks of wildfires and disrupted the food chain. These risks were exacerbated by the increase in visitors to Aberdeenshire's green spaces due to the sunny weather, causing additional work for the Council's Environment & Sustainability Services.

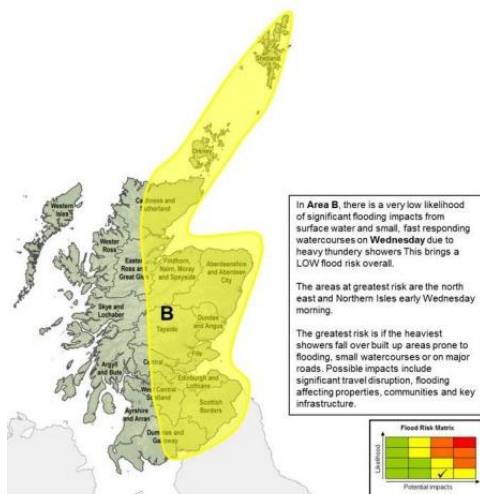
The agricultural sector also faced significant challenges as crops and livestock suffered from heat stress resulting in reduced yields and economic losses leading to additional support from the Council's Planning & Economy services. This impact was even more severe due to the challenges the sector was already facing with Brexit and the COVID-19 pandemic.

**Impacts:** damage to ecosystems and biodiversity, damage to land and vegetation, disruption to services, increased demand for services, increased engagement and support to communities, risk to employees, risk to health and wellbeing

### 3.3.2 Thunderstorms 11<sup>th</sup> and 12<sup>th</sup> August 2020

**Please note this section contains information about the Stonehaven Derailment of 12<sup>th</sup> August 2020 which some readers may find distressing.**

In August 2020, Aberdeenshire was hit by heavy rains and thunderstorms causing flash flooding mainly in the south of the region. SEPA reported an hourly rainfall of greater than 50mm and the equivalent of a month's worth of rain in three hours.



*SEPA and the Met Office's Flood Guidance Statement Area of Concern map from 11<sup>th</sup> – 12<sup>th</sup> August*

The impact of this was severe damage and disruption to transport infrastructure, school closures and flood damage to residential and council properties, predominately in the Stonehaven area due to surface flooding and minor flooding from the river Carron. However, the most severe impact was the train derailment at Carmont near Stonehaven known as the Stonehaven Derailment.

The incident occurred when a passenger train enroute from Aberdeen to Glasgow encountered severe weather conditions, derailed, and slid down an embankment causing the death of one of the passengers, the driver, and the conductor, and injuring six passengers. Investigations

afterwards attributed the incident primarily to a landslip triggered by the heavy rain which caused stones and debris to fall on the tracks resulting in the derailment. The incident had significant implications for the rail industry in Scotland and the UK and highlighted the need for robust safety measures, especially during adverse and extreme weather conditions.



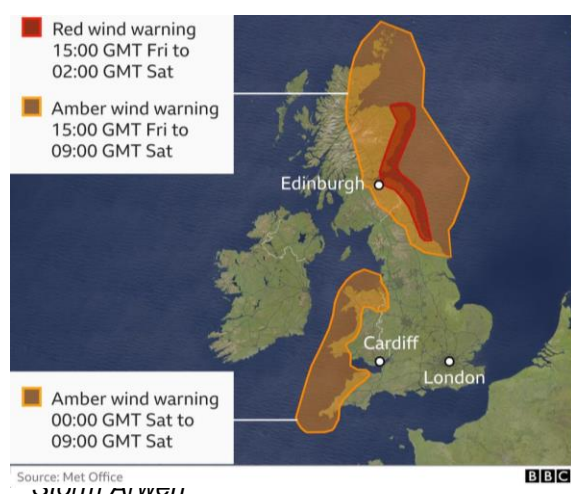
The impact of the August thunderstorms to Aberdeenshire Council was not just the cost and disruption to services caused by the flood damage to infrastructure and properties, but also the emotional impact the Stonehaven Derailment had on Council employees and elected members who live and work in the area as well as the wider community. The derailment was also a stark reminder of the vulnerability of transport infrastructure to extreme weather events and the severity of the consequences of these events.

**Impacts:** damage to council buildings, damage to housing stock, damage to infrastructure, disruption to services, financial cost, increased demand for services, increased engagement and support to communities, risk to health and wellbeing

### 3.3.3 Winter Storms 2021 – 2022

Between November 2021 and February 2022, Aberdeenshire was hit by seven storms in quick succession: Arwen, Barra, Malik, Corrie, Dudley, Eunice, and Franklin. These brought powerful winds, heavy rain, snow, and freezing temperatures all of which had severe immediate impacts and lasting effects on the region and Aberdeenshire Council. What intensified the severity of these storms was how close together they were, giving communities and Council services little time to repair and prepare between each one.

The biggest impacts were to Aberdeenshire's infrastructure and landscape. Strong winds brought down trees causing extensive damage to power lines and the loss of power and communication networks to several communities. Roads were blocked by fallen trees, debris and flooding which affected transportation and made many homes in the area, including those without power, inaccessible to emergency and Council services. In addition, many employees were unable to travel during and after the storms due to unsafe road conditions. This included employees from Property and Facilities services who were unable to reach and repair weather damaged buildings, resulting in the closure of some public buildings.



The most damaging of the storms was Storm Arwen between 25<sup>th</sup> and 29<sup>th</sup> November 2021. This storm was issued with a red wind warning by the Met Office and became the most damaging storm to hit Aberdeenshire since Storm Frank in 2015. Thousands of homes were left without power, and an Aberdeenshire resident died when his pick-up truck was hit by a falling tree. During and after Arwen, schools were closed, and school transport

cancelled due to unsafe travel conditions. High winds resulted in telecom outages which impacted all services and had a severe impact on the Council's Digital DRT Service, obstructing employees, and contractors from operating passenger transport systems, including school transportation. Walking paths were washed away, Council buildings and housing stock were damaged and several areas, including Ballater, Stonehaven and Portsoy were affected by floods thereby increasing the demand for Council services.

The severity of Storm Arwen also put a considerable strain on the Communications Team to keep employees and communities up to date with weather warnings, travel information and updates on power and other recovery efforts after the storm. Power and communication loss also meant that some home-based Council employees were unable to work causing disruption to many services.

One of the biggest impacts of all the storms, including Arwen was to Aberdeenshire's woodlands and greenspaces. The 2021 – 2022 storm season flattened and caused considerable damage to more than 30ha (just under 10%) of Council owned woodland, including parks and open spaces where trees were snapped or uprooted by the storms' high winds, with Haddo Country Park being the most affected.

*Table.2 Impact of 2012 – 2022 winter storms on Aberdeenshire Council managed woodland*

Site	Area affected (hectares)
Aden Country Park	6.4
Haddo Country Park	12.4
Lucy Laws Woods, Banff	1.3
Battlehill, Huntly	3.4
Gauchhill, Kintore	1.0
Meadows, Huntly	0.7
McDonald Wood, Ellon	3.0
Cleanhill, Aberchirder	0.4
Alford Community Campus	1.9
Rhynie Industrial Estate	0.5
	<b>31ha</b>

In addition to damage to property, roads, and power systems by fallen trees, their loss has had an immediate and long-term effect on Aberdeenshire's biodiversity, which relies on these trees for habitat and food. The sheer amount of woodland lost and damaged has also had a significant impact on the Council services responsible for clearing trees and repairing any associated damage, and those responsible for

recording the damage and the long-term programme of work to clear and replant trees.

**Impacts:** damage to council buildings, damage to ecosystems and biodiversity, damage to housing stock, damage to infrastructure, damage to land vegetation, disruption to services, financial cost, increased demand for services, increased engagement and support to communities, risk to employees, risk to health and wellbeing



*Storm damage to trees following Storm Arwen in November 2021*

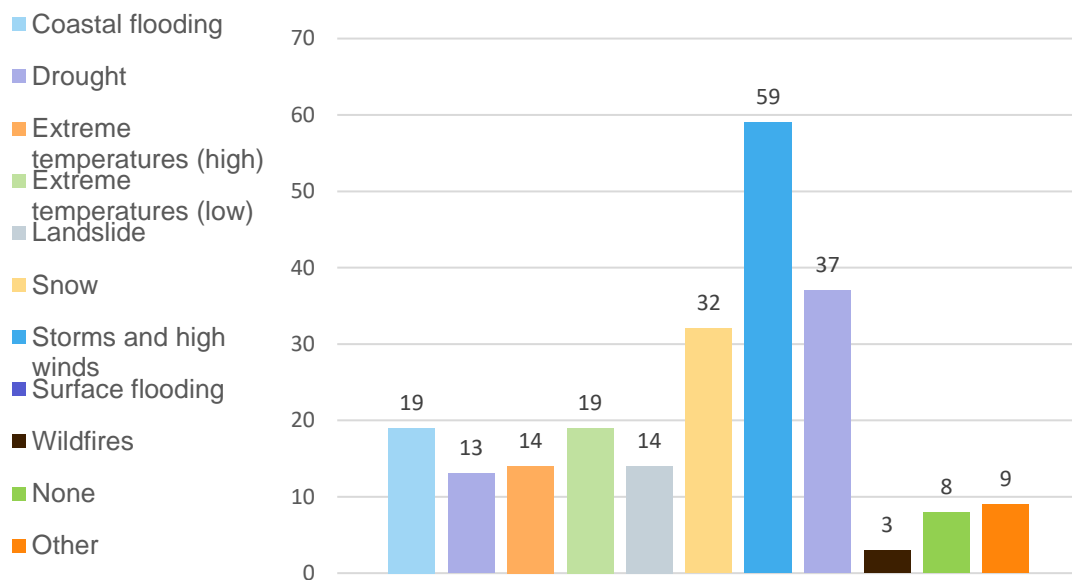
### 3.4 Summary of Impact on Aberdeenshire Council Services

This summary and the data below are from responses to the Aberdeenshire Council Employee Climate Change Resilience and Adaptation questionnaire and interviews. All participants were asked to provide answers only related to extreme weather events between 1<sup>st</sup> January 2019 and 31<sup>st</sup> December 2022.

When employees were asked if their service had been impacted by any of the following weather events during this period, less than 11% said their service had not been impacted. Storms and high winds and coastal flooding were the most common events affecting services.

The table below shows employees reported their services being impacted by 19 incidents of coastal flooding, 13 droughts, 14 extreme high temperatures, 19 extreme low temperatures, 14 landslides, 32 incidents of snow, 59 storms and high winds, 37 incidents of coastal flooding and 3 wildfires between 2019 and 2022. 8 employees reported no incidents impacting their service and 9 employees reports other events.

*Table. 2 Weather events which impacted Aberdeenshire Council services*



When asked to comment further on what affect these events had, the most frequent impacts to services were:

- Damage to council buildings
- Damage to ecosystems and biodiversity
- Damage to housing stock
- Damage to infrastructure
- Damage to land and vegetation
- Disruption to services
- Financial costs
- Increased demand for services
- Increased engagement and support to communities
- Risk to employees
- Risk to health and wellbeing

Although all Aberdeenshire Council services were affected in some way by extreme weather events, the following directorates and services were most impacted:

- Business Services (Customer & Digital, Finance, Legal & People, Property & Facilities Management, Risk & Resilience)
- Education and Children's Services (Education, Live Life Aberdeenshire)
- Environment and Infrastructure Services (Environment & Sustainability, Housing & Building Standards, Planning & Economy, Roads & Infrastructure)
- Health and Social Care Partnership (Health & Social Care)

Please note this list does not include all services within each directorate, only those most impacted.

### 3.4.1 Business Services



#### Customer & Digital:

Each extreme weather event required additional support from the Communications Team before, during and after each event, including customer service support through a helpline for residents. Any weather event which caused a power outage made it even more difficult for the team.



#### Finance

The finance team faced additional pressure in processing the costs of each weather event for repairs, resource and recording claims. Between 1<sup>st</sup> January 2019 and 31<sup>st</sup> March 2022, the following eligible costs were recorded when the Bellwin Scheme was activated, but as the total costs did not reach the £1.2 million threshold, no actual claims were made and therefore no monies were received. These figures showed the highest financial costs were from the damage caused by Storm Arwen in November 2021 followed by Storms Malik and Corrie in January 2022. The financial cost of other extreme weather events has not been recorded.

Table.3 Costs to services by each storm claimed through the Bellwin Scheme

	Arwen	Barra	Malik & Corrie	Dudley, Eunice & Franklin
<b>Business Services</b>	401,460	0	403,600	1,729
<b>Education &amp; Children's Services</b>	25,897	0	12,450	550
<b>Environment &amp; Infrastructure Services</b>	142,225	0	26,478	7,142
<b>Health &amp; Social Care Partnership</b>	3,256	0	636	0
<b>Housing</b>	97,856	41,161	44,821	0
<b>Total</b>	<b>670,694</b>	<b>41,161</b>	<b>487,985</b>	<b>9,421</b>



With regards to insurance claims, Aberdeenshire Council issued 25 Public Liability Claims related to storms and flooding between 1<sup>st</sup> January 2019 and 31<sup>st</sup> December 2022, 4 of which were settled to a total value of £8,624.



#### Legal & People:

The biggest impact on Council employees was the inability to attend work or fulfil their duties. From March 2020 onwards, many of Aberdeenshire Council's staff began working from home due to the COVID-19 pandemic. This meant they were less impacted by unsafe road conditions and disruption to transport but were affected by power outages, making it impossible for some employees to work from home. Many front-line employees who were not working from home, were also unable to attend work due to weather related travel restrictions and unsafe road conditions. These challenges were compounded by the increased demand for Council services as employees were called on and redeployed to other services and areas. This was to provide additional help and support to communities and vulnerable service users and people affected by weather events.



#### Property & Facilities Management:

Due to the nature of the service, Property & Facilities Management saw an increase in demand for their services due to Council property damage caused by extreme-weather events, in particular flooding, storms, and high winds. The service also attended to the private water supplies they maintained when these ran dry during annual droughts. Other impacts included attending to extreme high and low temperatures in offices, care homes and schools which were affecting the health and wellbeing of employees, pupils, and residents, and attending incidents of damage to the external fabric of several buildings and school playgrounds due to storms and high winds. As these services were often required during or immediately after weather events, employees also had to ensure they were not putting themselves at risk by travelling to incidents in unsafe weather conditions.



#### Risk and Resilience

This service is the key responding and co-ordinating unit for Aberdeenshire Council so is involved in all responses to extreme weather events. The need for this service has greatly increased over the period of 2019 to 2022 in terms of responding and working with communities and council services to increase their resilience and prepare for future events.

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### 3.4.2 Education and Children's Services



#### Education:

The biggest impact to this service was the closure of schools due to power outages, damage to buildings and grounds, and the inability of staff and pupils to reach schools due to unsafe travel conditions and the cancellation of school transport services. Transport services were cancelled to blocked, icy, and flooded roads or due to high winds if the service was normally operated by double deck vehicles.

Each of the major storms from 2019 to 2022 led to closures and loss of working days which had knock on effect on the school programme and already tight timescales for course completion. In August 2020, Portlethen was closed due to torrential rain and in the same month flooding from Storm Francis damaged Dunnottar School's boiler and heating system. The storms and flooding of 2021 caused power outages cutting school staff off from their virtual network and reducing access to schools. From November to December 2022 several schools were closed, external staff training and placements and after school youth activities were cancelled and school transport routes were cancelled due to the flooding and high winds of Storm Arwen and the heavy snow in December.

#### Live Life Aberdeenshire:



There were forced facility closures, property damage and reduced service delivery due to weather events which caused a significant financial cost and loss of income to Live Life Aberdeenshire, at a time when the service was still trying to recover from the devastating impact of the closure of their facilities during the COVID-19 pandemic. Localised flooding in November 2021 had a significant impact on the Huntly Nordic Centre and surrounding parks and fields, leaving the centre inaccessible. The Centre was then closed due to fallen trees following the 2021 – 2022 storms. Heavy rain and localised floods caused closures at Alford Ski centre due to standing water on the slope, and flooding and snow caused closures of Turriff Sports Centre and other sport and community facilities. There was also additional pressure on the Cultural Engagement team to salvage and restore collections damaged from weather events and to safeguard them from future events, as well as provide support to community cultural partners such as the Fraserburgh Lighthouse Museum.

### 3.4.3 Environment and Infrastructure Services



#### Environment & Sustainability

Several storms over the winter 2021 – 2022 caused extensive loss of tree cover destroying large sections of woodland and affected many parks, cemeteries, and open spaces. Access to sites was restricted and paths damaged due to fallen trees and damage.

The inaccessibility of some areas such as McDonald Park in Ellon and Haddo Country Park also affected Aberdeenshire Ranger led public, school and group activities. The Ranger's service faced additional challenges. The hot weather and pandemic travel restrictions saw an increase in visitors to the countryside, leaving litter, causing damage, and not following cooking guidance or paying attention to fire risk warnings causing damage to sites through wildfires.

With regards to Aberdeenshire's environment and biodiversity, planting of trees and vegetation did not grow or thrive due to drought and flood conditions, which then impacted the ecosystem and biodiversity. Regular drought affected mature trees and woodland habitats and changes in temperature have increased invasive species numbers and tree disease. There has been an overall loss of biodiversity due to weather impacts.

- Waste Services

There was flooding at the Souterford Waste Deport following Storm Arwen and disruption to waste collection services due to blocked roads and unsafe driving conditions.



#### Housing & Building Standards:

The biggest impact to this service was responding to the damage to housing stock following extreme weather events. These included burst pipes and property damage following low winter temperatures, power outages caused by storms, and damage to housing and sheltered housing, from wind damage and flooding. In Stonehaven, Huntly, Ballater and Inverurie, this required some tenants to be rehoused. Within the service, low temperatures with ice and snow meant some meetings between employees and tenants were cancelled due to unsafe travel conditions.



#### Planning & Economy:

Within the Historic Environment services, land slip and slope instability associated with extreme weather events affected several of Aberdeenshire's historic sites. These included Macduff Cross which has been restored and reset due to slope

instability and St. Brandon's Inverboyndie which will be a major project in 2024 due to slope instability. There is also concern that other damaged sites may be left as 'managed decline' as this may be the only viable option.

The planning service also saw an increase in emergency permitting for damages (increase in requests for emergency permits) which occurred during these events and in planning applications following flooding.

Droughts caused private water supplies to dry up, in some cases for months, which created additional work for the Environmental Health Service as residents ran out of water. This has had a long-term effect as some of these supplies have never returned or if they do, the quality of the water has been altered meaning new supplies need to be found. Furthermore, the longer periods of high temperatures promoted blue green algae and a risk of Legionella which posed a public health risk. The Private Water Supply team had to deal with the impact of these conditions in addition to their routine work.

Demand for the services of the Food Safety team also increased due to unsafe water as flooding impacted businesses who were forced to close due to potential contamination and the increased risk of public health issues.

Freezing pipes due to low temperatures and tree roots ripping up distribution pipes or lack of power following storms resulted in no power pumps or treatment which also led to no water in homes and council buildings or water that was unsafe to drink.

These cold temperatures increased residents' use of fires and stoves which resulted in an increase in complaints to the Environmental Health Service regarding smoke issues from people not knowing how to manage fires and stoves correctly.



*Tree being held up by an HV cable B993 Craigeam in November 2021*



### Roads & Infrastructure:

The Roads and Infrastructure service are responsible for all of Aberdeenshire's 5,640 kilometres of roads, 1,300 kilometres of footpaths and pavements, and its 1,300 plus bridges. Given its remit, all extreme weather events increased the demand for this service. These events also caused disruption in delivering services and additional strain and potential risk to their employees on an almost daily basis. A further implication of damages to roads and bridges from storm conditions is this can change the prioritisation order of other maintenance works resulting in greater delays to that work. Frontline services include preparing, clearing, and repairing damage to roads, paths and bridges, street light maintenance and drainage.

- Bridges:

Heavy rainfall events led to swollen rivers which damaged bridges and scoured bridge foundations causing bridge closures and repairs. Frost damage to concrete bridges, for example, the A93 Inver Underpass Dec 2022; landslide causing blockage of a culvert on the A93/330 Allt Domhain in October 2022; and scour at the Mill of Sterin Bridge in late 2022 resulted in closures and damage.

- Electrical grid infrastructure:

Storms and high winds after the 2021 – 2022 storm season caused damage to the electrical grid infrastructure and telecoms network infrastructure resulting in power outages and had an impact on the aim of further expansion of telecoms networks as telecoms operators had to repair and upgrade historic infrastructure before expanding new infrastructure. The storms in Aberdeenshire and their impacts have set back improvements in digital connectivity for the region.

- Footpaths:

Footpaths were damaged and blocked by flooding and debris following storms. These had to be repaired and cleared as soon as possible for the health and safety of residents.

- Road maintenance:

Every storm and cold weather event increased the demand for road maintenance services; from gritting routes and supplying grit bins to communities, to snow and debris clearing, including trees from roads.

The provision of the winter maintenance service, costs Aberdeenshire Council between £4 and £9 million depending on the severity of the winter, with approximately 220 frontline staff working to ensure the region's road infrastructure is safe. However, the unexpected severity of the 2021 – 2022 storm season and the number of storms in a short period of time meant the service was unable to adequately prepare for the 2021 – 2022 winter.



The service was also under pressure to clear and repair roads as soon as possible following each event increasing pressure on the service and their employees. In many cases there were delays in responding to weather events as driving conditions were too dangerous for employees to travel.

Added to this, the pandemic and the cost of fuel following the invasion of Ukraine meant the level of winter maintenance and capacity of the roads service was severely reduced.

#### 3.4.4 Aberdeenshire Health and Social Care Partnership



Aberdeenshire  
Health & Social Care  
Partnership

The most direct impact to this service was responding to incidents where people had been injured or become unwell due to weather events, for example injured in storms or heat-related illnesses, this included ensuring people in their care such as patients, care home residents and vulnerable adults were protected from the effects of weather events and extreme changes in temperature. Within the service poor or no internet connection and loss of power were also an issue and snow, high winds and flooding made it impossible to meet clients in person or for employees to come into work. At times both staff and service users were sent home due to high winds.



*Snow plough in the Cairngorms National Park near Aviemore in December 2022.*

## 4 Recommendations and Next Steps

### 4.1 2011 – 2018 LCLIP Recommendations update

The [2011 – 2018 LCLIP](#) was published in 2019 with the recommendations below. Unfortunately, due to the COVID-19 pandemic and staff turnover within the Sustainability and Climate Change Team, Aberdeenshire Council are not as far on as they would have liked with these recommendations, however progress has been made.

The key recommendations from the previous LCLIP were:

1. Development of a Climate Change Adaptation Strategy to ensure a uniform approach across services in addressing climate change risk.

**Update:** This has been progressed through the recruitment of a Sustainability & Climate Change Officer in January 2023. The officer is responsible for implementing the Council's long-term climate change and adaptation and resilience programme to ensure a uniform approach across services in addressing climate change risk. The first step in this programme is the 2019 - 2022 LCLIP and progression of the recommendations within this and the 2011 – 2018 LCLIP report. This will be followed by the formation of a cross-service Climate Change Adaptation and Resilience short-life working group who will contribute to updating the Aberdeenshire Council's Climate Change Risk Register, benchmarking the Council's adaptation capability against Adaptation Scotland's [Benchmarking Framework](#) and the publication of an Employee Climate Change Adaptation and Resilience Guide.

2. Updating the Climate Change Risk Register to reflect the [UKCP18 projections](#) and the findings of the latest LCLIP.

**Update:** The Climate Change Risk Register was reviewed and updated in 2023 using the [Met Office's Climate Data Portal](#). The mitigating actions and leads for these actions within the register will be uploaded onto the Council's Pentana system to ensure they are allocated and monitored. Climate change is identified as a risk within both the Corporate Risk Register and Directorate Strategic Register and service managers have been asked to include climate change risks in their appropriate risk registers.

3. Consideration of impacts outlined in the LCLIP when supporting climate mitigation and adaptation action across Aberdeenshire.

**Update:** This is ongoing across all services - climate change and resilient communities are strategic priorities in the Aberdeenshire Council Plan 2022 - 2027 and adaptation is included in the Route Map to 2030 and Beyond. An Integrated Impact Assessment (IIA) to examine the impacts of project proposals on climate change adaptation has been introduced and requires consideration at every Council Committee. [Local Development Plans](#) have identified adaptation as an element of their vision and plans.

Adaptation actions that have been delivered following the 2011 – 2018 LCLIP include:

- The creation of [Climate Ready Aberdeenshire](#) to raise awareness and understanding of climate risks, support decision-makers and link private, public and third sector organisations across Aberdeenshire.
- Building more resilient and sustainable paths.
- A bridge scour alert system to monitor and react to severe rainfall and an emergency closure plan for the rapid closure of certain major bridges if required.
- Flood Protection studies across the region focussing on direct defences, relocation of properties and property protection.
- Business-critical operational buildings now have backup generators in case of failure during extreme weather events.
- Impacts of climate change were included in the Aberdeenshire Council Pollinator Action Plan 2019 – 2021 and updated [2022 – 2027 plan](#).

4. Explore the options around having a cost code that is explicitly linked to severe weather events and further investigated possibilities of having a central fund for climate change costs and adaptation measures.

**Update:** This recommendation has not been progressed but will be discussed with the Council's Finance team. Please see recommendations in this report.

5. Capture costs from weather-related incidents so that cost benefit analysis for adaptation can be included in future decision making.

**Update:** Costs are captured partly through the [Bellwin Scheme](#) to assist with the immediate and unforeseen costs on dealing with the aftermath of emergency incidents. However, these are only related to storms and do not include damage from other weather-related incidents. A process to capture all events including heatwaves, etc has been included in the recommendations of this report.

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6. Explore research and development opportunities in adaptation and resilience-building technologies.

**Update:** This work was progressed in part through the adaptation capability benchmarking exercise undertaken by the Sustainability and Climate Change team in 2020. It will continue through further adaptation benchmarking and annual reports to Adaptation Scotland.

7. Explore opportunities for Aberdeenshire to tap into the economic growth potential of climate adaptation and resilient infrastructure.

**Update:** This has not been progressed but will be suggested to the members of Climate Ready Aberdeenshire and Aberdeenshire Council's Route Map to 2030 and Beyond steering group as a project for consideration.

8. Engage communities through workshops to explore climate risk and adaptation measures.

**Update:** This work is ongoing through:

- [Climate Ready Aberdeenshire](#) including Climate Ready Strathdon.
- [Emergency Planning Risk and Resilience team](#)
- [Flooding Team](#)
- [Digital Stakeholder Team](#)

Since the publication of the 2011 – 2018 LCLIP report, the North East Scotland Climate Action Network (NESCAN) Hub has been formed with a remit to provide support and advice to communities regarding climate change mitigation and adaptation. In 2022 [NESCAN Hub](#) held their first Climate Change Adaptation workshop for communities with assistance from the Aberdeenshire Council Sustainability and Climate Change team.

**Further information on how Aberdeenshire Council is assessing, managing, acting, and reporting on climate and weather-related risks can be found in [Aberdeenshire Council's Public Bodies Climate Change Report](#).**

## 4.2 2019 – 2022 LCLIP Recommendations

The following recommendations for consideration are based on the data gathered through the completion of this LCLIP, the progress of 2011 – 2018 LCLIP recommendations and the views of employees gathered through the Employee Climate Change Adaptation and Resilience questionnaire and interviews.

As stated in section 2.4. these are recommendations for how Aberdeenshire Council can prioritise adaptation, resilience issues and risks, and recommendations for how Aberdeenshire Council and its employees can increase their preparedness for extreme weather events. Please note these recommendations are stated here for further discussion and exploration alongside the work being done already on climate change adaptation.

### Key Recommendations

1. **Climate change adaptation and resilience training programme.** This should include an ALDO (Aberdeenshire Learning & Development Online) module for all employees and councillors regarding climate and weather trends, impacts, and their responsibilities; specific training for managers to ensure adaptation and resilience is built into teams, systems and decision-making; and service specific training modules designed by services with assistance from the Sustainability and Climate Change team.
  2. **Management plan** or model to ensure all extreme weather events are given equal prioritisation. The Flood Risk Management Plan is a good example of this and could be replicated for other weather events, in particular heatwaves and incidents of high temperatures as these will become more frequent and intensify.
  3. **Cost code** to capture costs from all extreme weather events, including non-storm events so that a cost benefit analysis for adaptation can be included in future decision making, and investigating the feasibility of establishing a **central fund** for climate change costs and adaptation measures.
  4. **Employee redeployment and volunteer programme** for extreme weather-events with training and capacity for employees to respond to events and assist services and communities where required.
  5. **Communication and engagement plan for communities** to raise their awareness of the impacts of extreme-weather events, provide advice on how to build their resilience, signpost to useful resources, and explain what their responsibilities are and the responsibilities and capabilities of Aberdeenshire Council. This would complement the current work of the [Community Resilience Service](#), [Climate Ready Aberdeenshire](#) and [NESCAN](#) (North East Scotland Climate Action) Hub.
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## 4.3 Next Steps

Following the publication of this report, the next steps for Aberdeenshire Council are:

- Discuss the recommendations within this report with the Risk and Resilience Team, leaders, and service managers and at appropriate group meetings and committees, and if they are approved, create an agreed action plan.
- Finalise the Climate Ready Aberdeenshire Strategy considering the results and recommendations within this report.
- Further embed adaptation, resilience, and climate change risk in Aberdeenshire Council by supporting services, in particular with identifying and managing climate change risks to their service with the support of the Sustainability Champions programme.
- Collate and share the results of Employee Climate Change Adaptation and Resilience questionnaire and interviews across the Council employees, leaders, and councillors.
- Continue with the Council's long-term climate adaptation and resilience programme as part of the Council's Route Map to 2030 and beyond.



*Pennan, Aberdeenshire*

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Scottish Government Climate Change <https://www.gov.scot/policies/climate-change/climate-change-adaptation/>

Scottish Government Storm Arwen Review <https://www.gov.scot/publications/storm-arwen-review/>

SEPA Water Scarcity <https://www.sepa.org.uk/environment/water/water-scarcity/>

UK Climate Impacts Programme <https://www.ukcip.org.uk/>

## Contact

Aberdeenshire Council Sustainability & Climate Change Team

Woodhill House

Aberdeen

Aberdeenshire

AB16 5GB

Email: [sustainability@aberdeenshire.gov.uk](mailto:sustainability@aberdeenshire.gov.uk)

[www.aberdeenshire.gov.uk](http://www.aberdeenshire.gov.uk)

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