Draft Climate Adaptation Strategy Appendices

2025-2035

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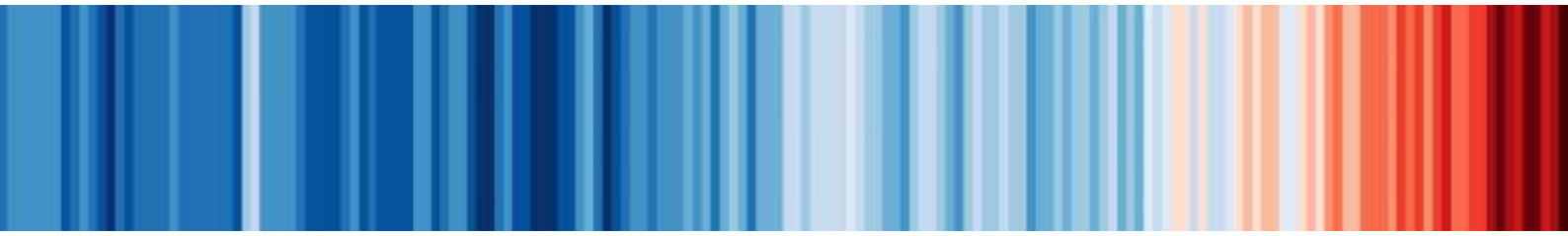
Stirling Council



*The warming stripes image in the header above illustrates **global temperature change** between 1850 and 2023, using data from the UK Met Office. Each stripe represents the temperature across our planet averaged over a year. Shades of blue indicate cooler than average years, while red shows years that were hotter than average. Dark red stripes on the right-hand side show the rapid heating of our planet in recent years.*

The Climate Stripes graphic was created by Professor Ed Hawkins at the University of Reading in 2018. Stripes images have now been created for more than 200 countries, states and cities (including Edinburgh, Glasgow, Scotland, and the whole of the UK) and are available to download for free from the show-your-stripes.info website.

More than a million people downloaded the stripes from the site within weeks of their launch. They have since appeared at United Nations meetings, on the BBC, at school climate strikes, numerous events and festivals, art installations, and on football strips and various promotional materials, including electric cars, buses and trains.

*The warming stripes on the back page of this document illustrate annual average temperature change in **Scotland** between 1884 and 2023.*

Appendix 1.
Climate Risks and Opportunities for Stirling

1. Introduction

This Appendix summarises climate change implications for Stirling based on evidence for the most recent UK Climate Change Risk Assessment (CCRA3) Technical Report, used to inform National Adaptation Plans. The Technical Report assessed 61 specific risks and opportunities and gave each an urgency score, captured in a Summary document for Scotland. The Summary outlines the most urgent risks for Scotland, those requiring more action and/or more investigation, and less urgent risks where current action is sufficient or where a watching brief is required.

2. Context

The Climate Change (Scotland) Act 2009 established the legal framework for adaptation planning in Scotland. Every 5 years since, Scottish National Adaptation Plans (SNAPs) have been prepared to address the impacts identified and to set out the Scottish Government's objectives for adapting to climate change. SNAP3, published in 2024, takes an outcomes-based approach based on the UN Sustainable Development Goals and Scotland's National Performance Framework.

The UK Climate Change Act 2008 commits the UK Government to assess "the risks for the UK from the current and predicted impacts of climate change", with reports also submitted to the devolved administrations. In response to the 3rd Climate Change Risk Assessment (CCRA3), Scotland's 3rd SCCAP (now renamed the National Adaptation Programme, or SNAP) is due to be published in September 2024. Local authorities are legally required to contribute to delivering the SNAP and provide evidence of that work in annual Public Bodies' Climate Change Duties reports.

3. The Assessment

The Climate Change Risk Assessment (CCRA) aimed to answer the question: "based on the latest understanding of current and future climate risks, opportunities, vulnerability and adaptation, what should the priorities be for the next UK National Adaptation Programme and adaptation programmes of the devolved administrations?"

Each of the risks identified was assessed in a 3-step urgency scoring process:

- What is the current and future level of risk?
- To what extent is the risk going to be managed?
- Are there benefits of further action in the next 5 years, over and above what is already planned?

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The analysis for each risk or opportunity is based on the evidence available and supplemented by additional research projects commissioned specifically for the CCRA3 Technical Report. Based on the evidence available, each risk was assigned one of four urgency categories as follows:

Urgency scores and colour coding used

Category	Description
More action needed	New, stronger, or different action – over and above that already planned – would be beneficial in the next 5 years to reduce risks
Further investigation	More evidence is urgently needed to fill significant gaps or reduce the uncertainty in the current level of understanding to assess the need for additional action
Sustain current action	Continued implementation of current or planned activity is needed to ensure that the risk or opportunity continues to be managed in the future.
Watching brief	The evidence for these risks should be kept under review, with continuous monitoring of risk levels and adaptation activity so that further action can be taken, if necessary.

Sector assessments in the tables on the following pages outline the nature of the risk or opportunity anticipated for a range of receptors, the likely impacts, urgency score, and potential actions to reduce the risk or to capitalise on any opportunities identified.

Sector Assessment Tables

A. Natural Environment and Assets						
Risk/ Opp?	Receptor	Nature of risk or opportunity	Impacts	Local Urgency Score	Potential Actions	Action Plan Ref.
R	N1. Terrestrial species and habitats	Changing climatic conditions and extreme events, including temperature change, water scarcity, wildfire, flooding, wind, and altered hydrology, (including water scarcity, flooding and salt intrusion).	Changes to physiology or phenology (timing of life cycle events), changes in population composition and abundance, and distribution of species.	More action needed	Reduce existing pressures, improve condition of protected wildlife sites, and restore degraded ecosystems, such as peatlands, wetlands, and native woodlands.	3.1.1, 3.1.2, 3.1.3, 3.1.4, 3.3.1, 3.4.2, 3.4.3, 2.4.7
R	N2. Terrestrial species and habitats	Pests, pathogens, and invasive species. NatureScot consider Invasive non-native species (INNS) the 2nd most serious threat to global biodiversity, after habitat loss.	Range of ecosystem services threatened (such as carbon storage and biodiversity) and cultural heritage (such as parks, gardens and designed landscapes).	More action needed	Enhanced prevention, monitoring, surveillance, and initial response. Economic and environmental costs of managing established pests etc. considerably higher than measures to prevent establishment.	1.1.2, 1.4.2, 2.2.4, 3.1.2, 4.2.2
O	N3. Terrestrial species and habitats	New species colonisations.	Increased populations and range expansion of species.	Further investigation	As with N1. Ensure joined-up approach with net-zero policies to avoid risks from e.g. intensive forestry & biofuel production.	1.1.8, 3.1.1

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A. Natural Environment and Assets

Risk/ Opp?	Receptor	Nature of risk or opportunity	Impacts	Local Urgency Score	Potential Actions	Action Plan Ref.
R	N4. Soils	Changing climatic conditions, including seasonal aridity and wetness.	Erosion, compaction and pollution leading to loss of soil biodiversity and organic matter. Also impacts to freshwater biodiversity, water quality and GHG emissions.	More action needed	Integrated, long-term planning for ambitious land use policies, such as woodland expansion, based on local soil properties. Nature-based solutions to enhance slope stability.	1.1.8, 1.3.2, 3.2.1, 3.2.2
R&O	N5. Natural carbon stores, carbon sequestration, and GHG emissions	Changing climatic conditions, including temperature change and water scarcity	Increased oxidation from warmer, drier conditions; further degradation with increased runoff; losses from wildfires; higher sequestration in mild, wet climates.	More action needed	Targeted actions to restore degraded carbon stores, especially peatlands. More strategic land use planning to integrate multiple benefits from agriculture and forestry.	1.2.7, 2.4.8, 3.1.1, 3.2.1, 3.2.2, 3.3.1, 3.4.2
R&O	N6. Agricultural and forestry productivity	Extreme events and changing climatic conditions (including temperature change, water scarcity, wildfire, flooding, coastal erosion, wind)	Reduced wheat yield from waterlogging, reduced area of arable land from drought, reduced whisky productivity, disrupted irrigation, timber growth & quality impacts.	More action needed	Crop diversity, low-carbon farming, improved nitrogen-use efficiency, enhanced soil quality measures, flood risk management, diversification.	3.2.2, 3.3.1, 3.4.2
R	N7. Agriculture	Pests, pathogens and invasive species	Increased damage to crops, livestock and general productivity.	More action needed	Monitoring, surveillance, risk assessment and biosecurity measures.	1.1.2, 1.3.2

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Risk/ Opp?	Receptor	Nature of risk or opportunity	Impacts	Local Urgency Score	Potential Actions	Action Plan Ref.
R	N8. Forestry	Pest, pathogens and invasive species	Reduced productivity and timber quality	Watching brief	Surveillance and modelling, risk assessment, improved biosecurity.	1.1.2, 1.3.2
O	N9. Agricultural and forestry productivity	New / alternative species becoming suitable	Enhanced suitability for new crops	Further investigation	Opportunities to meet demand from local produce, potential for new varieties and intercropping.	1.3.1, 3.3.1, 4.3.3
R	N10. Aquifers and agricultural land	Sea level rise, saltwater intrusion	Minimal risk due to surface water dominance over groundwater.	Watching brief	Better storage, such as rainwater harvesting and on-farm reservoirs.	
R	N11. Freshwater species and habitats	Changing climatic conditions and extreme events, including higher water temperatures, flooding, water scarcity and changes in timing of species annual cycles (i.e. phenological shifts)	Loss of sensitive species, changes in phenology and species composition. Water quality issues, changes to max peak flows, and flashier runoff. Changes to timing of salmon migration	More action needed	Assisted natural recovery, weir removal, re-meandering and flood embankment removal. Expanded beaver range for wetland habitat creation. Small, upstream waterbodies targeted for downstream impacts.	2.4.1, 2.4.3, 2.4.4, 2.4.7, 3.4.2, 3.4.3
R	N12. Freshwater species and habitats	Pests, pathogens and invasive species	Competition with native species, predation, introduced disease, habitat alteration leading to increased flooding and costs.	More action needed	Monitoring and surveillance, prevent introduction and establishment, enhanced biosecurity measures, enforcement, effective eradication.	1.1.2, 1.3.2, 3.1.2

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Risk/ Opp?	Receptor	Nature of risk or opportunity	Impacts	Local Urgency Score	Potential Actions	Action Plan Ref.
O	N13. Freshwater species habitats	New species colonisations	Species movement and range expansion northwards or to higher altitudes	Sustain current action	Actions for N11 could be beneficial to new and existing native species.	2.4.3, 2.4.7, 3.4.3
R	N14. Marine species, habitats, and fisheries	Changing climatic conditions, including ocean acidification and higher water temperatures	Changing distribution and abundance of species, including decline of Atlantic salmon.	More action needed	Reduce over-fishing and pollution. Develop habitat restoration initiatives.	1.3.1, 1.4.1
O	N15. Marine species, habitats, and fisheries	Changing climatic conditions	Potential arrival of warm water species, such as Northern hake.	Further investigation	Enhanced monitoring of species and habitat changes.	1.3.1, 1.4.1
R	N16. Marine species and habitats	Pests, pathogens, and invasive species	Viruses, fungi, bacteria, antimicrobial resistance - especially aquaculture. Pacific oyster spread.	More action needed	Biosecurity regulations, best practice, public awareness and citizen science.	1.3.1, 1.4.1
R&O	N17. Coastal species and habitats	Coastal flooding, erosion, and climate factors	Coastal erosion, flooding, accretion, saline inundation.	More action needed	Habitat creation, managed realignment, natural flood management, salt marsh restoration.	1.3.1, 1.4.1
R&O	N18. Landscape character	Climate change	Changes from natural responses to biodiversity, soils, geomorphology, hydrological processes, and coastal processes.	Further investigation	Landscape narratives to support public perceptions of nature, climate and human-environment relationships and different adaptation options.	1.2.2, 1.2.3, 1.4.1, 1.4.2

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B. Health, Communities and the Built Environment

Risk/ Opp?	Receptor	Nature of risk or opportunity	Impacts	Local Urgency Score	Potential Actions	Action Plan Ref.
R	H1. Health and wellbeing	High temperatures	Increased heat-related mortality, risk of unintended injury & accidents, impacts on maternal health, mental health, labour productivity, and incidence of injury for workers.	More action needed	Better alignment with decarbonisation policies. Prioritise passive cooling over mechanical cooling measures. Retro-fit passive cooling measures. Better heatwave warning systems.	2.1.5, 2.1.7, 2.4.8, 4.1.1, 4.1.3, 4.1.6
O	H2. Health and wellbeing	High temperatures	Reduced cold-related mortality. Increased physical & mental health benefits from outdoor activity, contact with nature, and Vitamin D exposure. New crops and improved nutrition.	Further investigation	Interventions to enhance opportunities for increased outdoor recreation and active travel.	2.2.7, 4.1.6
R	H3. People, communities, and buildings	Flooding	Death or injury, long-term and severe impacts on mental health & wellbeing, damage to property, loss of and damage to possessions, disrupted access to employment, education, health services and wider facilities, illness from water-borne pathogens or chemical contaminants.	More action needed	Future-proof design of the built environment, invest in natural infrastructure, promote natural flood risk management, restrict development in flood risk areas, adapt existing infrastructure, increase investment in socially vulnerable areas, increase take-up of Property Flood Resilience measures, greater monitoring & enforcement of SuDS.	1.2.1, 1.2.2, 1.3.3, 2.2.5, 2.4.2, 2.4.3, 2.4.4, 4.1.1, 4.1.4, 4.2.2

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Risk/ Opp?	Receptor	Nature of risk or opportunity	Impacts	Local Urgency Score	Potential Actions	Action Plan Ref.
R	H4. Viability of coastal communities	Sea level rise	Physical change to shoreline caused by coastal erosion, coastal landslip, permanent inundation, or coastal accretion.	Watching brief	Monitor work of Dynamic Coast and other relevant initiatives	1.3.1, 1.4.1
R	H5. Building fabric	Moisture, wind and driving rain	Damage to dwelling fabric from moisture, high winds, subsidence, and insect damage. Potential harm to health and wellbeing from damp and injury from damaged buildings.	Further investigation	More proactive action to assess risks and integrate into planning, building design and retrofit. Integrated design approach for new build and retrofits to avoid risk of higher indoor vapour and mould growth from increased insulation and airtightness.	1.2.3, 2.1.2, 2.1.5, 2.1.9, 2.1.10
R&O	H6. Household energy demand	Summer and winter temperature changes	Reduced heating demand counterbalanced by increased cooling demand in summer, with potential for 'summer fuel poverty'	More action needed	Better integration with decarbonisation actions. Use of adaptive pathways in energy policy (as used in flooding). Use passive in preference to mechanical cooling, where appropriate.	2.1.8, 2.1.10, 2.4.8, 3.3.1
R	H7. Health and wellbeing	Changes in indoor and outdoor air quality	Increased particulates, ground level ozone, mould and pollen. Mixed impact for indoor air quality (could improve or reduce).	Further investigation	Implement Cleaner Air for Scotland Strategy. Nature-based solutions and improved green spaces. Monitor research on wildfire, pollen, air pollutants and heat.	1.1.2, 2.1.10, 2.4.8, 3.1.5, 3.3.1

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Risk/ Opp?	Receptor	Nature of risk or opportunity	Impacts	Local Urgency Score	Potential Actions	Action Plan Ref.
R	H8. Health	Vector-borne disease (i.e. transmitted by e.g. ticks, mosquitos, or fleas)	Changed distribution and higher incidence due to warmer temperatures and high humidity.	Further investigation	Improved disease and vector monitoring and surveillance, plus early warning.	4.1.6, 4.2.1
R	H9. Food safety and food security	Higher temperatures (food safety) and extreme weather (food security)	Occurrence and persistence of bacteria, viruses, parasites, harmful algae, fungi and their vectors in crops and livestock produced in the UK. Disrupted growing season from heat stress and reduced summer rain. Near term shortages in access to healthy, affordable food.	Further investigation	Food regulations and education on food handling & safety, plus monitoring for emerging risks. Routine monitoring of food security to protect public health and limit costs for health & social care system.	1.1.2, 1.2.1, 1.2.2, 1.4.1, 4.1.6, 4.4.1, 4.4.3
R	H10. Health	Poor water quality	Water scarcity & droughts, interrupted household water supplies & associated impacts, especially for vulnerable households and isolated private water supplies. Contamination from increased runoff and flooding events overwhelming water treatment plants. Pollution from historic landfills. Algal bloom health risks.	Further investigation	Reduce risk of surface water flooding with nature-based solutions, SuDS, catchment management, wetland creation, improvements to bathing water quality. Domestic water-saving measures.	1.2.1, 1.2.2, 1.3.3, 1.4.1, 3.3.1, 3.1.2, 2.2.5, 2.4.1, 2.4.2, 2.4.6, 3.4.1

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Risk/ Opp?	Receptor	Nature of risk or opportunity	Impacts	Local Urgency Score	Potential Actions	Action Plan Ref.
R	H11. Cultural heritage	Changes in temperature, precipitation, groundwater, land, ocean, and coastal change	Increased roof leakage, shrink-swell, penetrating damp, water ingress, condensation, desiccation and/or waterlogging of gardens & archaeological sites, reduced resilience of parks, gardens, plants & trees, increased disease, plant growth, pests. Increased footfall, demand for air conditioning. Unintended consequences of climate activities in other sectors.	More action needed	Hazard mapping, standardised data collection & sharing. More robust systems to prioritise assets for action. Greater cross-sectoral working to avoid conflicting approaches and maladaptation. Use climate threats to heritage assets & landscapes to communicate impacts and motivate people to take action.	1.1.1, 1.1.3, 1.1.8, 1.1.9, 1.1.10, 1.2.5, 2.1.2, 2.1.5
R	H12. Health and social care delivery	Extreme weather	Damaged buildings and disrupted transport services. Impacts on health & wellbeing increase demand for services. Overheating in and flooding of hospitals, care homes & related buildings.	More action needed	New-build and retro-fit design for future climate: improved glazing, draught-proofing, shutters, ceiling fans, reflective surfaces, green infrastructure. Thermal comfort monitoring.	2.1.2, 2.1.4, 2.1.9, 2.4.8, 4.1.6
R	H13. Education and prison services	Extreme weather	Children more vulnerable to heat risks: high indoor temperatures affecting health, wellbeing & cognitive performance; lack of shading outdoors and radiative heat from hard surfaces. Increased flood risk, especially from surface water. Flat roofs susceptible to heavy rainfall damage. Limited ventilation and overheating in prison buildings. Potential for flooding and drought.	More action needed	School climate adaptation plans with specific targets, strategies, tasks and roles. Building design & retrofit: green, blue, or cool roofs, natural ventilation systems, flood protection and recovery measures. Regular maintenance of roofs, gutters & drains. Raise equipment above flood level. Backup power generation. Rain planters & gardens, tree & shade structures, drain filters, permeable surfaces.	1.4.3, 2.1.1, 2.1.2, 2.1.4, 2.4.5, 2.4.8, 3.1.5, 3.4.1

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C. Infrastructure

Risk/ Opp	Receptor	Nature of risk or opportunity	Impacts	Local Urgency Score	Potential Actions	Action Plan Ref.
R	I1. Infrastructure networks (water, energy, transport, ICT)	Cascading failures	Examples: coastal flooding inundates power infrastructure; travel & freight operations impacted by power supply interruptions; health & welfare impacts from interrupted water supply.	More action needed	Common standards of resilience (e.g. ISO14091), improved information & data sharing, systems-based resilience planning.	1.1.4, 1.1.5, 1.1.6, 1.1.7, 2.3.1, 4.1.6
R	I2. Infrastructure services	River and surface water flooding	Scotland-wide: increased risk of river flooding to sewage treatment works, railway lines and stations; all infrastructure at increased risk of surface water flooding (power stations, electricity substations, sewage treatment works, railway lines and stations).	More action needed	Screen investments for climate risks, integrate blue-green infrastructure and SuDS, identify road network most vulnerable to flooding.	1.1.4, 1.1.8, 1.3.1, 1.3.3, 1.3.4, 2.2.6, 2.4.2, 2.4.3
R	I3. Infrastructure services	Coastal flooding and erosion	Increased vulnerability in low-lying coastal areas.	Further investigation	Quantification of scale of risk, with improved monitoring and evaluation of existing policies.	1.1.4. 1.1.8, 1.3.4
R	I4. Bridges and pipelines	Flooding and erosion	Soil erosion and scour of foundations, transport disruption, ruptured gas pipelines, loss of fibre optic communications, failure of old short-span masonry arch bridges.	Further investigation	Improved drainage, erosion monitoring, structural upgrades, re-routing lines from high-risk areas, changes to maintenance operations.	1.1.4, 1.3.1, 2.2.3, 2.2.4, 2.4.3

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Risk/ Opp?	Receptor	Nature of risk or opportunity	Impacts	Local Urgency Score	Potential Actions	Action Plan Ref.
R	I5. Transport networks	Slope and embankment failure	High rainfall combined with dry weather and cracking leading to increased incidents, especially railway cuttings, mountainous and upland areas (more so in autumn and winter).	More action needed	Need to factor projected heavy rainfall increases into renewal programmes, slope inspections, reinforce vulnerable slopes with managed vegetation.	1.3.5, 2.2.2, 2.2.4, 2.2.6, 2.4.3, 3.3.1
R	I6. Hydroelectric generation	Low or high river flows	Reduced power output, damaged generation equipment and associated infrastructure.	Further investigation	Consider climate impacts in site selection & design, ensure suitable spillways, increase reservoir size and/or turbine capacity, use no-regret options.	1.3.1
R	I7. Subterranean and surface infrastructure	Subsidence	Damage to infrastructure from shrinkage and swelling of clay soils, or collapse of pre-existing cavities and mine workings.	Further investigation	More detailed information on sub-surface composition. Increased ground & weather monitoring. Use of real-time decision support tools.	1.1.4, 1.1.8
R	I8. Public water supplies	Reduced water availability	Potential for future supply-demand deficit	Sustain current action	Demand reduction & management, tighter building regulations, metering, and drought research.	2.1.3, 2.1.6, 4.1.6
R	I9. Energy generation	Reduced water availability	Restricted abstraction or water discharge to freshwater systems by thermal power generators, inc energy from waste plants.	Watching brief	Monitor risk levels, early warning and emergency management during extremes.	1.1.4, 1.1.6, 4.1.6, 4.2.1

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C. Infrastructure

Risk / Opp?	Receptor	Nature of risk or opportunity	Impacts	Local Urgency Score	Potential Actions	Action Plan Ref.
R	I10. Energy	High and low temperatures, high winds, lightning	Reduced generation from thermal generators & PV cells, line faults and increased demand (cold, snow & ice), damage from wind-blown debris, power cuts from lightning.	Further investigation	Better understanding of risk thresholds, research into impacts of different weather events.	1.1.1, 1.1.2, 1.1.4
R	I11. Offshore infrastructure	Storms and high waves	Destabilisation or degradation of mechanical systems & structures, reduced energy output & operating periods, damage to cabling systems, prevention of access for maintenance & inspection.	Watching brief	Changes to design loads, extreme wave elevation and accessibility for maintenance and crew transfer.	
R	I12. Transport	High and low temperatures, high winds, lightning	Buckled rails, sagging overhead cables, signal failure, maintenance prevented, trees / branches / debris on routes, increased thermal loading on bridges & pavements, long detours & community isolation, vulnerable high-sided vehicles, delayed flights, suspended port operations.	More action needed	Enhanced weather incident reporting, asset condition monitoring and revised standards. Mainstream climate considerations into planning and design.	1.1.1, 1.3.5, 2.2.1, 2.2.4, 2.2.6, 2.4.3
R	I13. Digital	High and low temperatures, high winds, lightning	Failure of telecoms & mobile base stations, inability to access affected sites leading to reduced capacity in other essential services, high temperature challenges to data centres, poor performance of radio systems, damaged overhead cables.	Further investigation	Incorporate digital infrastructure in adaptation plans. Identify and protect assets at risk of flooding & wildfires.	2.3.1

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D. Business and Industry

Risk/Opp?	Receptor	Nature of risk or opportunity	Impacts	Local Urgency Score	Potential Actions	Action Plan Ref.
R	B1. Flooding of business sites	Increase in flood risk	Damage to buildings and wider infrastructure, including electricity loss. Uninformed investment decisions leading to lock-in to surface water flooding. Increased insurance and capital costs.	More action needed	Low-regret actions to improve evidence, awareness-raising, advice & support. Flood forecasting and warning services. Property flood protection.	1.1.4, 1.4.1, 4.3.2, 4.3.3, 4.3.5
R	B2. Coastal business locations and infrastructure	Coastal flooding, extreme weather, erosion, and sea level rise	Loss of coastal business locations and infrastructure (access, power, communications). Erodible coastal buildings, roads, rail and water networks.	More action needed	Prioritise assets for protection. Upgrade flood protection, water-saving devices, heat reduction in offices, business continuity plans, natural water storage/drainage, green roofs, tree planting. Change location for long-term viability.	1.1.4, 1.1.8, 1.3.4, 2.3.1, 2.4.3, 3.3.1, 4.3.1
R	B3. Business production processes	Water scarcity	Reduced cooling, heating, washing, dissolving, and suppressing dust. Reduced productivity and demand for products and services.	Further investigation	Demand reduction, water resource management plans, improved meter reading and water consumption data. Improved farming compliance and reformed abstraction licensing.	1.1.4, 1.2.1, 1.3.1, 1.3.4, 4.3.5
R	B4. Business access to finance, investment, and insurance	Extreme weather	Decline in insurance availability and affordability, reduced asset value, increased credit risks and cost of capital. Financial shocks to business. Increased subsidence claims. Stranded assets.	Sustain current action	Risk-sharing agreements, disclosing & reporting, financial & physical risk metrics, incorporate risk reduction & data into insurance requirements, resilience bonds, predictive modelling & decision-making.	1.1.4, 1.3.4, 1.2.1, 4.3.2, 4.3.5

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D. Business and Industry

Risk/ Opp?	Receptor	Nature of risk or opportunity	Impacts	Local Urgency Score	Potential Actions	Action Plan Ref.
R	B5. Reduced employee productivity in businesses	Infrastructure disruption and higher temperatures in working environments	Employee health & well-being, ability to commute to work, overheating in home environments, greater heat stress in certain occupations.	Further investigation	Reduce heat in commercial buildings (link to domestic buildings H1), new ways of working, low-C and energy-efficient buildings.	4.1.6, 4.2.1, 4.3.2, 4.3.4, 4.3.6
R	B6. Disruption to business supply chains and distribution networks	Extreme weather	Increased disruption, shortages, reduced profitability. In agriculture: pests, diseases, soil erosion, port closures, power outages, acidified oceans, extreme heat for workers.	More action needed	Learning from Covid-19. Build capacity, develop new ways of working, product diversification, more storage facilities, scenario analysis, and robust planning. Support supply chains by incentivising adaptation measures.	1.1.5, 4.3.2, 4.3.3, 4.3.4, 4.3.5
O	B7. Changes in demand for goods and services	Long term climate change	Increased profitability in costs & demands for goods and services: retail, tourism, marine, forestry, agriculture, shipping, seafood, construction, climate advisory, consulting, accounting services, finance and heritage. Increased repairs, maintenance, or clean-up contracts.	Further investigation	Evidence and support to businesses to transition to new functions. Identify opportunities for increased demand for goods & services. Retro-fit building stock for greater resilience – link to low carbon work. Investigation into emerging sectors.	1.2.6, 4.3.2, 4.3.3, 4.3.4, 4.3.5, 4.3.6, 4.4.3

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E International Dimensions

Ris/ Opp?	Receptor	Nature of risk or opportunity	Impacts	Local Urgency Score	Potential Actions	Action Plan Ref.
R	ID1. UK food availability, safety, and quality	Decreasing yields from rising temperatures, water scarcity, and ocean changes globally	Food price spikes, reducing accessibility and increasing food insecurity.	More action needed	Develop food systems that are resilient to disruption. Address food access inequality, access to fresh produce, and informed dietary choices.	4.1.2, 4.4.1, 4.4.2, 4.4.3, 4.4.4
O	ID2. UK food availability and exports	Increases in productivity and areas suitable for agriculture overseas	Trend for plant-based diets and plant-based meat substitutes have potential to reduce emissions and improve diets.	Watching brief	Ensure access to broad range of international markets.	4.3.5, 4.3.6
R	ID3. Migration to the UK and effects on the UK's interests overseas	Climate-related international human mobility	Some places increasingly difficult to live in. Risks to well-being. Overseas development gains and investments undermined.	Watching brief	Ensure pathways for regular migration. Alter negative perceptions of migration. Social mechanisms that support integration and fill gaps in skilled labour.	4.1.6, 4.3.6
R	ID4. The UK's international interests and responsibilities	International violent conflict resulting from climate change overseas	Pre-existing causes of conflict amplified, social and economic progress slowed or reversed, international investments and aid undermined, increased need for humanitarian assistance & disaster relief.	Watching brief	Trans-boundary agreements allowing flexibility and specificity over shared resources.	1.1.5, 1.3.4

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E. International Dimensions

Ris/ Opp ?	Receptor	Nature of risk or opportunity	Impacts	Local Urgency Score	Potential Actions	Action Plan Ref.
R	ID5. Changes to international governance affecting the UK	Reduced international collective governance due to climate change and responses to it	Potential to threaten and weaken international law & governance, impacting UK economic, diplomatic & military interests.	Watching brief	International diplomacy to ensure the UK preserves interests and strengthens image as a respected multi-lateral player: engage constructively with climate processes.	1.1.4, 1.3.4
O	ID6. Increased trade for the UK	Arctic ice melt opening up new trading routes	Potential for increased tourism & provision of maritime services. Reduced transport distances.	Watching brief	Port development in areas supporting trade and tourism opportunities.	
R	ID7. International trade routes	Climate hazards affecting supply chains	Flooding of factories or mines, disrupted supply-chain logistics, poor resilience of high-efficiency, just-in-time delivery.	More action needed	Increase resilience: build in redundancy of stocks, diversity of sources (substitutions), distributed networks, and create greater flexibility/adaptability.	1.1.2, 1.1.4, 4.1.4, 4.4.3
R	ID8. Economic loss to the UK	Climate driven resource governance pressures and financial exposure	Significant financial exposure to extreme weather in London global insurance market: stressed pension funds.	Sustain current action	Adopt Task Force on Climate-related Financial Disclosures (TCFD) recommendations.	1.1.4, 1.3.4

Appendix 1.
Climate Risks and Opportunities for Stirling

E. International Dimensions						
Ris/ Opp?	Receptor	Nature of risk or opportunity	Impacts	Local Urgency Score	Potential Actions	Action Plan Ref.
R	ID9. Introduction of infectious diseases to the UK from abroad	Increase in vector-borne diseases due to climate change	Previously tropical diseases now moving to western Europe. Potential for local transmission as UK climate changes.	More action needed	Improved monitoring, communicate outdoor risks, improve training of primary health care practitioners, surveillance programmes, random screening.	1.1.2, 4.1.6, 4.2.1
R	ID10. Risk multiplication to the UK	Interactions and cascades of named risks across systems and geographies	Covid-19 example: emergence linked to climate change then led to disruptions in demand, trade, supply chains, & labour.	More action needed	Joined-up assessment of overall risk of international climate change on UK.	1.1.2, 1.1.4, 1.3.4

Appendix 2.
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International

UN Sustainable Development Goals, 2015

Adopted by all UN Member States in 2015, the 2030 Agenda for Sustainable Development provides a shared blueprint for peace and prosperity for people and the planet, now and into the future. At its heart are 17 Sustainable Development Goals (SDGs) which provide an urgent call for action by all countries. The SDGs recognise that ending poverty and other deprivations must go hand-in-hand with strategies that improve health and education, reduce inequality, and spur economic development while also tackling climate change and working to preserve and enhance the natural environment and biodiversity. Sustainable Development Goals | United Nations Development Programme (undp.org)

The Paris Agreement, December 2015

At the UN 21st Conference of the Parties (COP 21) Paris session, in December 2015, signatories to the UN Framework Convention on Climate Change (UNFCCC) agreed to accelerate and intensify actions and investments needed for a sustainable, low- carbon future. For the first time, the Paris Agreement brought all nations into a common cause to undertake ambitious efforts to combat climate change and adapt to its effects. The central aim of the Agreement is to keep global temperature rise this century well below 2°C above pre-industrial levels and as close as possible to 1.5°C. The Agreement also aims to increase the ability of countries to deal with the impacts of climate change.

All Parties are required to put forward their best efforts through "nationally determined contributions" (NDCs) and to strengthen these efforts in the years ahead. This includes requirements that all Parties report regularly on their emissions and on their implementation efforts. There will also be a global stocktake every 5 years to assess collective progress towards achieving the purpose of the agreement and to inform further individual actions by Parties. The Paris Agreement | UNFCCC

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Strategic and Legal Context

UN Inter-governmental Panel on Climate Change Synthesis Report of the 6th Assessment Reports (IPCC AR6 SYR), 2021-23

The 6th Assessment Cycle produced 3 reports into: The Physical Science Basis of Climate Change (9 August 2021); Impacts, Adaptation and Vulnerability (28 February 2022); and Mitigation of Climate Change (4 April 2022), with a Synthesis Report of the findings released 20 March 2023.

Headline Statements:

- Human activities have unequivocally caused global warming, and this is already affecting many weather and climate extremes in every region across the globe, leading to widespread adverse impacts and related losses and damages to nature and people.
- Policies and laws outlined in 2021 NDCs make it likely that warming will exceed 1.5°C during the 21st century and make it harder to limit warming below 2°C. Finance flows fall far short of the levels needed to meet climate goals across all sectors and regions.
- Risks and projected adverse impacts and related losses and damages escalate with every increment of global warming, with some future changes unavoidable but they could be limited by deep, rapid and sustained global greenhouse gas emissions reduction.
- Adaptation options deemed feasible and effective today will become constrained and less effective with increasing global warming.
- All global modelled pathways that limit warming to 2°C involve rapid, deep and immediate greenhouse gas emissions reductions in all sectors this decade.
- There is a rapidly closing window of opportunity to secure a liveable and sustainable future for all. The choices and actions implemented in this decade will have impacts now and for thousands of years.
- Delayed mitigation and adaptation action would lock-in high-emissions infrastructure, raise risks of stranded assets and cost-escalation, reduce feasibility, and increase losses and damages.
- Rapid and far-reaching transitions across all sectors and systems are necessary to achieve deep and sustained emissions reductions and secure a liveable and sustainable future for all. These system transitions involve a significant upscaling of a wide portfolio of mitigation and adaptation options. Feasible, effective, and low-cost options for mitigation and adaptation are already available, with differences across systems and regions. AR6 Synthesis Report: Climate Change 2023

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Strategic and Legal Context

Inter-governmental Platform on Biodiversity and Ecosystem Services (IPBES) Assessment Report, 2019

Established in 2012, IPBES is an independent body comprising over 130 member Governments. It aims to provide policy makers with objective scientific assessments about the state of knowledge regarding the planet's biodiversity, ecosystems and the contributions they make to people, as well as options and actions to protect and sustainably use these vital natural assets.

Key messages of the Report:

A. Nature and its vital contributions to people are deteriorating worldwide;

B. Drivers of change (changes in land and sea use, exploitation of organisms, climate change, pollution, and invading non-native species) have accelerated in the last 50 years;

C. Goals to conserve and sustainably use nature cannot be met by current trajectories; and

D. Nature can only be conserved, restored and used sustainably, and ensure other global societal goals are simultaneously met, through urgent and concerted efforts that foster transformative change.

Global Assessment Report on Biodiversity and Ecosystem Services | IPBES secretariat

Water Framework Directive, 2000

The Directive aims to reshape water management across Europe through a sustainable development lens by jointly considering human health, economic activities and ecosystems to move away from previous piecemeal water legislation.
Water Framework Directive (europa.eu)

The main aims of the Directive are to:

- Prevent deterioration and enhance the status of aquatic ecosystems, including groundwater;
- Promote sustainable water use;
- Reduce pollution; and
- Contribute to the mitigation of floods and droughts.

In Scotland, the legal and administrative implications were recognised in the Water Environment and Water Services (Scotland) Act 2003, which introduced a duty on Scottish Ministers, SEPA and 'responsible' authorities to promote sustainable flood management.

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Strategic and Legal Context

National

Climate Change (Scotland) Act 2009 and associated legislation

The Act was passed unanimously with cross party support and placed duties on public bodies to contribute to national emissions reduction targets, help deliver any statutory climate adaptation programme, and act in a way considered most sustainable in all functions. A 2015 Statutory Order requires larger public bodies to submit an annual report detailing their compliance with these Duties to reflect the expectation that the public sector will lead by example in addressing climate change. The 2020 Climate Change Duties Amendment Order introduced additional reporting requirements on emissions targets, aligning spend with these targets, and contributions to Scotland's adaptation programme.
Climate change: legislation - gov.scot (www.gov.scot)

Climate Change Plan, 2018-32

Scottish Government publishes a statutory strategic delivery plan for meeting emissions reduction targets at least every 5 years. The 2018 Climate Change Plan (CCP) was updated in December 2020 in response to the global climate emergency and to integrate amended emissions reduction targets from the 2019 Emissions Reduction Targets Act. The CCP update sets out bold actions and includes several transformational commitments to deliver both emissions reduction targets and ensure a green recovery as a result of the Covid-19 pandemic. Update to the Climate Change Plan 2018 - 2032: Securing a Green Recovery on a Path to Net Zero (www.gov.scot)

Scotland's National Adaptation Plan, 2024-2029

The document sets out the actions that the Scottish Government and partners will take to respond to the impacts of climate change from 2024 to 2029. The Plan commits to implementing more than 200 policies and actions spread across 23 Objectives that will deliver 5 Outcomes by supporting our communities, businesses, public services and nature to adapt to the changing climate in a way that is fair and inclusive.
Scottish National Adaptation Plan (2024-2029)

National Planning Framework (NPF4), 2023-2045

The national spatial strategy for Scotland sets out 3 spatial principles (Sustainable, Liveable and Productive Places), regional priorities, national developments, and 33 national planning policies, with **Policy 1**: *Tackling the climate and nature crises*, and **Policy 2**: *Climate mitigation and adaptation*. National Planning Framework 4

Appendix 2.
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Infrastructure Investment Plan, 2021-22 to 2025-26

The Plan is the Scottish Government's long-term vision to support Scotland's resilience, with *Building resilient and sustainable places* one of 3 core strategic themes.

Infrastructure is defined as the physical and technical facilities, natural and other fundamental systems necessary for the economy to function and enable, sustain or enhance societal living conditions. This includes the networks, connections and storage for the enabling infrastructure of transport, energy, water, telecoms, digital and internet to permit the ready movement of people, goods and services. It also includes the built environment of housing; public infrastructure such as education, health, justice and cultural facilities; safety enhancement such as waste management or flood prevention; natural assets and networks that supply ecosystem services; plus public services and resilience. Supporting documents - A National Mission with Local Impact: Infrastructure Investment Plan for Scotland 2021-22 to 2025-26 - gov.scot (www.gov.scot)

Regional Resilience Partnership Community Risk Register, 2021

A Community Risk Register (CRR) is a multi-agency publication that highlights risks with the highest likelihood and potential to have a significant impact in an area, causing disruption to specific regions and communities. Risk Preparedness Assessment Guidance.

Water Environment Legislation

List of legislation relating to the water environment in Scotland:
Water environment: legislation - gov.scot (www.gov.scot)

Scotland's Energy Strategy and Just Transition Plan

The Strategy vision is that, by 2045, Scotland will have a climate-friendly energy system that delivers affordable, resilient and clean energy supplies for Scotland's households, communities and business.

The Strategy's three overarching objectives are to:

- Significantly scale up renewable energy production;
- Secure continued and increased investment in the net zero energy economy; and
- Deliver a fairer, more secure energy system that is no longer reliant on volatile international commodity markets and delivers lower costs for consumers.

Scotland's Energy Strategy and Just Transition Plan

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Strategic and Legal Context

National Transport Strategy (NTS2), 2020

The Strategy vision for Scotland's transport system over the next 20 years is to have a sustainable, inclusive, safe and accessible transport system, helping deliver a healthier, fairer and more prosperous Scotland for communities, businesses and visitors. The vision is underpinned by 4 Priorities, each with 3 associated Outcomes. The Priority to *Take climate action* has Outcomes that will help deliver Scottish Government's net-zero target, adapt to the effects of climate change, and promote greener, cleaner choices.
national-transport-strategy.pdf

Nature Conservation (Scotland) Act 2004

The Act places a statutory Duty on all public sector bodies in Scotland to further the conservation of biodiversity: "It is the duty of every public body and office holder, in exercising any functions, to further the conservation of biodiversity so far as it is consistent with the proper exercise of those functions".
Guidance Note - Biodiversity Duty Explained | NatureScot

Forestry and Land Management (Scotland) Act 2018

The act provides the legislative framework to enable delivery of a package of other policy initiatives that the Scottish Government is introducing to increase forestry's contribution to Scottish Minister's economic, environmental and social ambitions.
Forestry devolution: resource list - gov.scot (www.gov.scot)

Scotland's Forestry Strategy, 2019-2029

The Strategy sets out the long-term approach to expanding, protecting and enhancing Scotland's forests and woodlands so they deliver greater economic, social and environmental benefits to Scotland's people, now and in the future.
Scotland's Forestry Strategy 2019–2029 - gov.scot (www.gov.scot)

Getting the best from our land: A Land Use Strategy for Scotland, 2021-2026

The Strategy recognises land as a fundamental resource which is vital for a successful economy, for the environment and for communities. The strategic vision, objectives and the long-term goal of the strategy are to achieve well-integrated, sustainable land use delivering multiple benefits to all of society. The Strategy emphasises the need for an ecosystem approach to land use decision-making and encourages this using three basic principles: consider natural systems; take account of the services that ecosystems provide; and involve people.
scotlands-third-land-use-strategy-2021-2026-getting-best-land.pdf (www.gov.scot)

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Local & Regional

The Stirling Plan (Local Outcome Improvement Plan), 2017-2027

Produced by the Stirling Community Planning Partnership (CPP), the Plan outlines how public sector organisations will work together with communities and voluntary groups, to improve people's lives, encourage fairness and make things more equal for everyone in Stirling. The ambition is to make Stirling a great place to live, work, study and visit, and make life better for those who are experiencing the greatest challenges. The Stirling Plan | Stirling Council

Thriving Stirling, Stirling Council 10 Year Strategy, 2020-2030

The Strategy is a blueprint for how the Council plans to transform services by setting out the context for change and how it will be delivered. Net Zero Carbon is one of four Strategic Outcomes in the Strategy for Stirling, alongside Social and Economic Equality, Financial Sustainability, and a Strong Economy. 10 year strategy | Stirling Council

Stirling Council Key Priorities, 2022-2027

The Council's 10 Strategic Priorities includes **Priority 8:** Tackling the climate & nature emergency and pursuing our net-zero ambition through action. Delivering this priority aims to reduce emissions and increase resilience while delivering many local benefits such as lower energy bills, economic regeneration, local job creation, reduced fuel poverty, improved health, avoided flood damage costs, enhanced green spaces, and improved air quality. Stirling Council agrees new key priorities for the coming years | Stirling Council

Stirling and Clackmannanshire City Region Deal (CRD)

The deal seeks to bring about a step change in the economic performance of the region and provide more opportunities and a fairer society for all. The CRD aims to develop and deliver a number of key projects and masterplans that present a significant opportunity to invest in our natural environment through the delivery of high-profile green infrastructure developments. This includes walking and cycling routes, a green roof on the Tartan Centre, an exemplar Public Service Innovation Hub, regeneration of Vacant and Derelict Land, a vision for Stirling River Park, and the Stirling Flood Alleviation Scheme. A multi-million-pound investment also saw the creation of Scotland's International Environment Centre (SIEC). Stirling and Clackmannanshire City Region Deal | Stirling Council

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Stirling Council Climate and Nature Emergency Motion, October 2019

Unanimously agreed at full Council meeting, the motion recognises the immediacy of the climate emergency and commits to using the powers of the Council to enforce, promote and engage with residents, traders and businesses in the area to reduce carbon, protect ecology, support resilience, and develop a climate ready infrastructure across the Council area. Climate Emergency Motion, Stirling Council 3 October 2019.

Climate and Nature Emergency Plan, 2021-2045

Following Council recognition of the Climate and Nature Emergency (CaNE) in October 2019, a strategic Emergency Plan was developed during 2020 and adopted in June 2021. The focus of the CaNE Plan is on activity across the Stirling Council area, including relevant Council activity. The Plan has **Key Objectives** on Energy, Transport, Resource Efficiency, Nature & Biodiversity, and Climate Adaptation. The latter **Objective** is to *Plan and Prepare for the impacts of Climate Change* and includes *maintaining a clear understanding of climate change risks* as one of 5 priorities. Climate and Nature Emergency Plan | Stirling Council

Local Development Plans (incorporating NPF4)

1. **Loch Lomond and the Trossachs National Park Authority's Local Plan 2017**

   The Local Plan must adhere to the National Park Partnership Plan and contribute to achieving the four aims of National Parks, one of which is to promote sustainable use of the natural resources of the area.

2. **Stirling Local Development Plan 2018**

   Climate Change Adaptation and Mitigation is one of 4 main themes from which the Over-arching Policy and more detailed Primary Policies, Policies and any associated Supplementary Guidance is derived. Sustainable Development Criteria, derived from Scottish Planning Policy, are incorporated for assessing proposals and reaching planning decisions.

   The Over-arching Policy requires all developments, land use changes, and other proposals, plus related frameworks, masterplans, planning briefs, strategies, etc, to demonstrate that appropriate measures for mitigation of and adaptation to climate change have been taken.

   In addition, there are:

   - Primary Policies on Flood Risk Management, Forest, Woodlands & Trees, Green Network & Open Space, and Green Belts;

- Policies on Reinstating Natural Water Courses and Development Impact on Trees & Hedgerows; and
- Supplementary Guidance on Planning & Flood Risk Management, Forest & Woodland Strategy, Trees & New Development, Green Network, and Green Belts.

The Statutory Development Plan | Stirling Council

Forth Local Flood Risk Management Plan, 2022-2028

The Plan has been developed to detail the actions to be taken to reduce the devastating and costly impact of flooding in the Forth Local Plan District and adopts the following objectives:

- Avoid an overall increase in flood risk; and
- Reduce overall flood risk.

Flood risk management plan | Stirling Council

Local Transport Strategy, 2017-2027

Strategy Objectives are to build a safer, better connected, inclusive, active & sustainable Stirling which is a quality place with a quality transport network. **Key Aim:** that the transport network in Stirling allows people and goods to get where they need to be safely and efficiently in ways that improve their health and do not damage the environment.
Local Transport Strategy 2017 - 2027 | Stirling Council

Stirling Active Travel Action Plan, 2017

The Plan outlines several actions to improve access infrastructure for walking and cycling, using both on-road and off-road routes. Upgrading or creating new off-road routes presents opportunities to deliver multiple blue and green infrastructure network benefits, such as path-side tree planting for shade and rainwater soak-aways that also provide valuable biodiversity habitat. Active Travel Action Plan | Stirling Council

Towns, Villages and Rural Area Transport Plan, 2015-2029

Improving the opportunities to walk and cycle – promoting the ability for all to safely access local services via walking and cycling, and enhancing healthy leisure and tourism infrastructure – is one of 4 delivery themes. The Plan will continue to allow the Local Transport Strategy to meet these obligations by designing infrastructure to adapt to climate change. stirling-council-towns-villages-and-rural-areas-transport-plan-2017-2027.pdf

Appendix 2.
Strategic and Legal Context

Local Housing Strategy, 2012 (under review)

One of 5 Outcomes is the **Quality and condition:** Improvements in the condition and energy efficiency of the whole housing stock, and reductions in carbon emissions and fuel poverty.

Key Actions

The Council and its partners will:

2.3 Maximise the uptake of grants, which assist the improvement of energy efficiency.

2.4 Develop packages of financial advice and assistance for homeowners wanting to repair and improve their properties.

2.7 Promote benefits and home energy advice to increase the take up of benefits and grants.

2.8 Increase the use of sustainable and renewable technologies in new houses.

2.9 In the face of increasing fuel prices, seek to help people out of fuel poverty by improved energy efficiency, income maximisation and advice on tariffs.

2.10 Through Care and Repair, target households vulnerable to fuel poverty who might benefit from advice & assistance. Local Housing Strategy | Stirling Council

Central Scotland Green Network (CSGN)

A national development within Scotland's National Planning Framework, the CSGN extends across 19 local authority areas and includes the part of Stirling not covered by the Loch Lomond & Trossachs National Park. CSGN's Vision is that "by 2050, central Scotland has been transformed into a place where the environment adds value to the economy and where people's lives are enriched by its quality".
Home - Central Scotland Green Network

Stirling & Clackmannanshire Forestry & Woodland Strategy (SCFWS), 2019

The Strategy sets out the Council's vision, strategy and objectives for the future of woodlands and forestry in the area and helps support woodland creation applications. It contains a vision that, through expansion, protection and sustainable management, the forests and woodlands of Stirling and Clackmannanshire will provide a range of benefits for local people and visitors and contribute to economic, environmental and social well-being.
Stirling & Clackmannanshire Forestry and Woodland Strategy

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Strategic and Legal Context

Alive with Nature Plan, 2021-2045

The Alive with Nature Plan sets out the actions the Council and partners have identified as being central to combatting the local impacts of the global climate and nature emergencies. The Plan aims to reduce or reverse harmful climate impacts across the entire Stirling Council area. Benefits include increasing the resilience of communities to extreme weather events.
alive-with-nature-plan-2021-45.pdf

Pollinator Strategy and Implementation Plan, 2023-2028

The Strategy supports the Pollinator Strategy for Scotland by detailing local action to help halt pollinator decline and reverse the losses. The aim of the Strategy is to achieve a robust, healthy and diverse population of pollinating invertebrates across the Stirling Council area.
Pollinator strategy | Stirling Council

6. Glossary

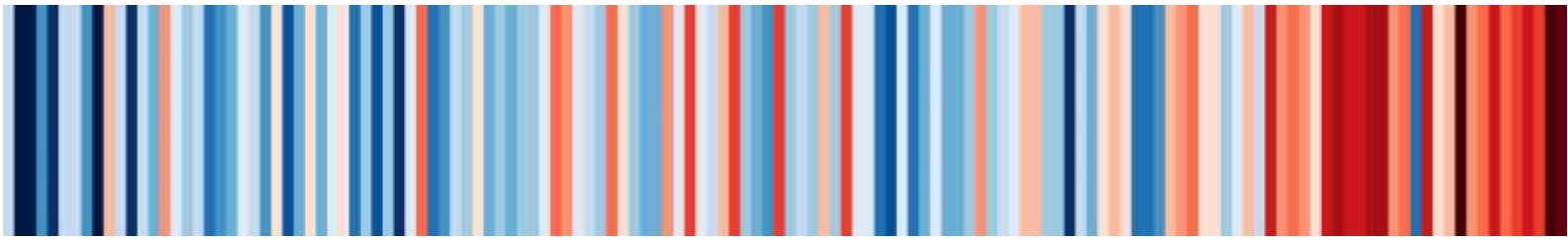
Active Travel	Any method of non-motorised travel, such as walking and cycling.
Agro-ecology	Farming in a way that imitates natural cycles to harness ecological interactions to benefit both agriculture and the environment. Includes low-till, mulching, inter-cropping and use of cover crops.
Biodiversity	The variety of all forms of life on Earth and the habitats on which they rely. This includes diversity within species, between systems and of ecosystems.
Blue & Green Infrastructure	Blue infrastructure relates to water features, such as rivers, canals, ponds, wetlands, and storm water provision. Green infrastructure refers to networks of trees, woodlands, grasslands, roadside verges, and parks.
Carbon Capture and Storage	Methods for separating, compressing and transporting carbon dioxide to a storage location for long-term isolation from the atmosphere.
Carbon Dioxide (CO_2)	The main gas that causes global warming, produced mainly by burning fossil fuels and clearing land.
Carbon Reduction	The process where an organisation reduces carbon dioxide and other global warming gas emissions from its activities.
Carbon Sequestration	The active process of absorbing carbon from the atmosphere by natural means (such as growing trees and maintaining peat) or industrial processes to deposit in a reservoir, such as former coal mines and geological seams.
Climate Adaptation	The process of adjusting to the effects of climate change by taking actions to limit the harmful consequences and to exploit any beneficial opportunities from the impacts of actual or expected climatic changes.
Climate Change	A long-term change in the average weather patterns that have come to define Earth's local, regional and global climates.
Climate Impact	The effect of climate on a situation, process, or person.
COP: Conference of the Parties	The governing body of an international convention (or treaty / written agreement). The COP is made up of representatives of member countries that have signed up to the convention, such as the UN Framework Convention on Climate Change (UNFCCC).
Detention Pond	A basin designed to collect and release storm water run-off to prevent flooding.
Eco-corridor	A geographical space on land or water that connects areas of natural habitat and allows species and natural processes to move freely. The aim of eco-corridors is to maintain or restore ecological connectivity and biodiversity.
Ecosystem	A natural environment that includes the flora and fauna that live and interact within that environment.

6. Glossary

Ecosystem Services	The many and varied benefits to humans provided by the natural environment, including pollination of crops, clean air, clean drinking water, waste decomposition, and the resilience and productivity of food systems.
Emissions	The production and discharge of something, especially a gas such as carbon dioxide.
Global Warming or Heating	The long-term heating of Earth's surface observed since the pre-industrial period (between 1850 and 1900) due to human activities, mainly fossil fuel burning and land use changes, which increase heat trapping gases.
Greenhouse Gas (GHG)	One of a group of gases that cause global heating: Carbon Dioxide, Methane, Nitrous Oxide, Chlorofluorocarbons, and Sulphur Hexafluoride.
Green or Living Roof	Roof of a building or structure that is partially or completely covered with plants and a growing medium, planted over a waterproof membrane. It may also include a root barrier and drainage & irrigation systems.
Green Wall	A vertical built structure intentionally covered by plants. Green walls include a vertically applied growth medium, such as soil or hydroculture felt, as well as an integrated hydration and fertilising system.
Habitat	The natural home or environment of an animal, plant or other organism.
Hazard	An object, situation or behaviour that has the potential to cause harm in terms of injury, ill-health, damage to property, damage to the environment, or a combination of these.
Nationally Determined Contributions (NDCs)	Non-binding national climate action plan to reduce national emissions, including targets to reduce GHGs. Each signatory to the Paris Agreement is required to establish a NDC Plan and update it every 5 years.
Natural Capital	The value of elements of the natural environment which provide valuable goods and services to people and society at large.
Nature-based Solutions	Conservation, restoration and improved land management actions that remove or reduce the impacts of climate change and/or increase carbon storage and GHG emissions.
Permeable	A material or membrane that allows liquids or gases to pass through it.
Phenology	The study of cyclic and seasonal natural phenomena, especially in relation to climate and plant and animal life.
Rain Garden	A garden that collects rainwater, holds and filters it before slowly releasing into the ground. They collect rainwater from impermeable surfaces like roofs, pavements, driveways, patios, or car parks, allowing the water to seep back into the ground to prevent runoff from flooding local waterways.

6. Glossary

Residential Drainage Channel	A linear channel used to remove surface water away from a given area, such as a patio, drive, pavement, or garden to prevent flooding.
Resilience	The ability or capacity to recover and return to an original state after experiencing difficulties or disturbance.
Risk	The possibility that something bad or unpleasant (such as injury or loss) will happen.
Sustainable Urban Drainage Systems (SUDS)	Built components that mimic natural features to manage storm water locally (as close to its source as possible) to mimic natural drainage and encourage infiltration, slow water throughput, and treat passively.
Sustainability	The capacity to maintain or improve the state and availability of desirable conditions or materials over the long term.
Sustainable Development	Development that meets the needs of the present without compromising the ability of future generations to meet their own needs.
Swale	A shallow, broad, vegetated channel with gently sloping sides designed to store and / or convey runoff and remove pollutants
Watershed	An area of high ground which divides two or more river systems so that all streams on one side flow into one river and those on the other side flow into a different river.



Annual average temperature change in Scotland, 1884-2023