

SCOTTISH CLIMATE CHANGE ADAPTATION PROGRAMME: PROGRESS REPORT 2020

First annual progress report on the “Climate Ready Scotland: climate change adaptation programme 2019-2024”

May 2020



Report laid before the Scottish Parliament by the Scottish Ministers under Section 54 of the Climate Change (Scotland) Act 2009, May 2020.

SG/2020/79



Scottish Government
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SUMMARY

Introduction

Scotland is already experiencing the effects of climate change and climate projections indicate that trends observed over the last century will not only continue, but are likely to intensify. Adapting to climate change will be necessary regardless of our commitment to net-zero emissions here in Scotland, as historic global emissions have already changed our climate and will continue to do so in the decades to come.

In order to prepare Scotland for the changing global climate, the Climate Change (Scotland) Act 2009 places a duty on Ministers to lay a programme for climate change adaptation before the Scottish Parliament in response to each 5-yearly UK Climate Change Risk Assessment (UKCCRA). The Act also requires the laying of an annual report on progress towards the current adaptation programme.

This is the first annual progress report on the second [Scottish Climate Change Adaptation Programme \(SCCAP2\)](#), which was published in September 2019 and covers actions for the period to 2024. SCCAP2 addresses the priority risks for Scotland set out in the [UK Climate Change Risk Assessment 2017](#) and its underpinning [Evidence Report Summary for Scotland](#). A brief summary of key findings from the risk assessment is set out in the Annex.

This report has fallen at the time of the COVID-19 pandemic, during which the Scottish Government's immediate actions are focused on supporting Scotland's people and businesses in dealing with the crisis. The Government remains committed to its climate change ambitions, both on adaptation and mitigation, but the current pandemic has necessarily impacted the context of this work. In particular, the assessments made here largely cover progress to SCCAP2 policies over the period from September 2019 to March 2020, rather than the additional emergency measures currently in place to respond to COVID-19. Nonetheless, the report is being provided to deliver the statutory obligations in a timely manner. A summary of next steps and future directions on adaptation, as an integral part of a green recovery from COVID-19, is provided at the end of this section.

Outcomes-based structure to the report

SCCAP2 uses an outcomes-based approach, derived from both the UN Sustainable Development Goals and Scotland's [National Performance Framework](#). This ensures that actions over the next five years to increase the capacity of Scotland's people, communities, businesses and public sector to adapt to climate change will also complement our international ambitions and integrate action on adaptation into wider Scottish Government policy development and service delivery.

There are seven high-level outcomes within SCCAP2, covering Scotland's communities, businesses and natural environment as well as our engagement with international partners. This annual progress report is also split into the same seven chapters. Each chapter provides examples of progress – since September 2019 - in implementing the policies and proposals that contribute towards that outcome. In some chapters, the examples are further grouped according to the sub-outcomes used

within that chapter of SCCAP2. The final chapter of this report summarises progress on the programme of research commitments in SCCAP2.

This report also builds on progress under the first Scottish Adaptation Programme, as set out in previous annual reports over the years 2015 to 2019. Copies of those reports can be found on the [Scottish Government website](#).

The role of the Adaptation Scotland programme

The [Adaptation Scotland programme](#) is funded by the Scottish Government to support capacity building and action on adaptation by the public sector, businesses and communities in Scotland. This includes developing Scotland's pioneering place-based approach to climate change adaptation. The contribution of these activities to delivering the high-level outcomes in SCCAP2 is summarised in each chapter of the report.

Scottish Ministers' assessment of progress towards implementing the objectives, proposals and policies set out in SCCAP2

The progress on policy and research delivery set out across the chapters of this report constitute good early progress towards implementing SCCAP2. However, it is necessarily early days for any such assessment to be made, given the immediate and transformational context of the COVID-19 crisis and the fact that it has, in any case, been less than nine months since SCCAP2 itself was published. Subsequent annual reports will provide opportunities for fuller assessments of progress and also for further developments in the format of reporting.

Next steps: a green recovery from COVID-19

While the Scottish Government's immediate priority is on responding to COVID-19, we are still firmly committed to our climate change ambitions including leading global climate action through the delivery of a sustainable, inclusive and resilient recovery. Action on climate change adaptation, in the context of wider societal and economic resilience, will form an important element of this. The [independent expert advice](#) published by the Committee on Climate Change on 6 May, which the Scottish Government has welcomed, identifies enhanced adaptation to climate change as one of the six key principle for guiding a wider resilient recovery from COVID-19.

In this context, the roll-out and further development of SCCAP2 will continue, but with individual policies revisited, as needed, to align these with the wider recovery. It is also recognised that new, accelerated and reactive policies may also now become appropriate, given the extent to which COVID-19 is changing the wider landscape. As one example, on 28 April 2020 the Scottish Government announced £10 million for temporary active travel infrastructure including pop-up cycle lanes and widening walkways. There will also, in time, be opportunities for further learning regarding the interactions between public health and critical infrastructure risks that are both climate and non-climate related. The current situation emphasises the importance of systems that can be resilient to *both* immediate and longer-term challenges including adapting to climate change.

The Scottish Government has welcomed the common sense decision to postpone COP26 until 2021. When the time is right, we look forward to welcoming delegates to a successful event in Glasgow and expect adaptation and resilience, as part of a green global recovery, to form an important element of those discussions.

One further element of SCCAP2 that we expect to particularly develop over the coming year is a monitoring and evaluation framework that will allow for clearer assessment of progress towards its high-level outcomes. Some initial proposals for such a framework were included in SCCAP2 itself and we expect to be able to provide an update on work to develop these as part of the next annual progress report in May 2021. Furthermore, as was the case with the first programme, the Adaptation Committee of the Committee on Climate Change will undertake independent expert assessments of SCCAP2 during its lifetime. The 2009 Act requires that the request for the first such assessment be issued by September 2021.

Chapter 1: Progress toward “our communities being inclusive, empowered, resilient and safe in response to the changing climate”

Our communities are shaped by the quality and character of the places we live and the people we live amongst. As Scotland begins to recover from COVID-19, we must ensure that our communities are able to adapt to the effects of climate change if they are to continue to flourish in the longer term. As communities form a fundamental component of our ability to adapt, SCCAP2 begins with a focus on these outcomes.

The changing climate will impact all of Scotland’s communities and each will be affected in different ways. Across Scotland, climate change will generally bring hotter, drier summers and warmer, wetter winters. In summer, more intense rainfall could bring heavy rainstorms with increased surface water flooding. In winter, more frequent rainfall could bring increased flooding from rivers and increased damage to buildings from wind driven rain. Increased storminess could result in increased coastal erosion, surges and wave overtopping of coastal defences and infrastructure. Sea level rise could affect the viability of some coastal communities through flooding and erosion. Local communities will need to take action to adapt to these changes, some sooner than others, depending on the local geography and social and economic conditions.

The Scottish Government believes that communities are best placed to make decisions and take action themselves, shaped by their own local geographies and demographics. ‘Placemaking’ is therefore used as a theme in this chapter of SCCAP2 –this is the idea that each place should be planned, designed, and managed to suit the needs and aspirations of the people who live there.

Progress on cross-cutting policies in support of this outcome

The Planning (Scotland) Act 2019 has strengthened the role of climate change adaptation considerations in the planning process by requiring Ministers to have regard to statutory adaptation programmes (currently SCCAP2) when preparing future iterations of the National Planning Framework. The [‘Transforming Planning in Practice - Post Bill Work Programme’](#) was published on 30 September 2019 and sets out a phased programme of work to implement most of the new Act. Early engagement has begun on the preparation of National Planning Framework 4 which, when complete, will combine the National Planning Framework and Scottish Planning Policy in a single document and will have development plan status for decision-making locally. Further information on the Planning Reform work packages and National Planning Framework can be found at: www.transformingplanning.scot.

The Place Standard Tool – An improvement programme led by the Place Standard implementation partners (Scottish Government, Public Health Scotland¹, Architecture & Design Scotland, Glasgow City Council, and the Improvement Service) is currently underway. This has involved extensive engagement with stakeholders and communities, including those with a particular interest in climate change adaptation. By integrating enhanced prompts relating to place-based climate change adaptation,

¹ Formerly NHS Health Scotland. On 1 April 2020 NHS Health Scotland became part of Public Health Scotland, Scotland’s national public agency for improving and protecting the health and wellbeing of Scotland’s people.

mitigation and sustainability within the relevant tool themes, the contribution of the Place Standard tool to addressing climate change will be strengthened. An independently pre-tested and enhanced new version of the Place Standard tool will be launched later in 2020 on a new Place website along with revised guidance and further information to support place-based approaches.

Examples of progress on policies in support of sub-outcome that: “People in Scotland's diverse communities are informed, empowered and adapting to climate change”.

The Scottish Flood Forum – The Scottish Government continues to grant fund the Forum to work with communities at flood risk. The grant was increased to £189,000 in 2019-20 to enable the Forum to support the Property Flood Resilience Delivery Group.

Scottish flood forecasting and warning services – SEPA has improved the Isle of Bute Flood Warning scheme, offering a more accurate flood warning service in the Kames Bay / Port Bannatyne area. A Flood Guidance Statement continues to be issued daily to all of Scotland's emergency response, utility and transport organisations. The Floodline service continues to provide information to registered users on when flooding is likely in their area. These services have all been tested for remote operation and remain operational (at the time of writing) during pandemic response. SEPA is committed to supporting people throughout the public health emergency and beyond; this includes maintaining its gauging network to support our flood forecasting and warning system.

RiverTrack – The SEPA-sponsored RiverTrack community alerting system has been extended in 2019 by a funding partnership brokered between Scottish and Southern Energy Networks and the Scottish Flood Forum. This system has enabled communities like Fintry, Blair Atholl and Alyth, where SEPA's own flood warning capabilities are limited, to improve their resilience to flooding.

Examples of progress on policies in support of sub-outcome that: “Scotland's buildings and places are adaptable to climate change”

SEPA “One Planet Prosperity – Our Flooding Strategy” – Following early engagement with partners and stakeholders SEPA's draft Flooding Strategy is ready for consultation. The consultation was intended to open on April 2020 but has been postponed in response to the current public health crisis. SEPA intends to formally consult stakeholders when it is appropriate, once the emergency of the pandemic has eased.

Property Flood Resilience Action Plan – In November 2019, the Cabinet Secretary for Environment, Climate Change and Land Reform launched the [Living with Flooding Action Plan](#). The Action Plan was developed by the Property Flood Resilience Delivery Group and has a range of actions to promote the use of flood resilient repairs and property level protection.

Flood Risk Management knowledge service – during 2019-20 this Scottish Government funded service included workshops with SEPA, consultants and other stakeholders to consider climate change allowances for flood risk assessment in land

use planning. There was also a strong adaptation theme at the annual conference, attended by 250 delegates.

Scotland's Learning Estate – In September 2019, the Scottish Government announced 11 projects as part of a first phase of the new £1 billion Learning Estate Investment Programme to coincide with the publication of the new Learning Estate Strategy. This initial phase of projects will seek to demonstrate the principles of the strategy, which recognises the need to ensure learning environments are able to adapt to climate change. Furthermore, the new Learning Estate Investment Programme builds on the success of the previous £1.8 billion Schools for the Future Programme which will see the construction or refurbishment of 117 schools and will benefit over 60,000 pupils by August 2020. The 99th and 100th schools as part of the Scotland's Schools for the Future Programme were officially opened by the Deputy First Minister in January 2020.

How the Adaptation Scotland programme is supporting this outcome

There is no one size fits all approach for communities in adapting to climate change. Adaptation Scotland is working across Scotland to support cities, regions and local communities to develop pioneering place-based adaptation approaches that reflect local needs and priorities.

[Adaptation Scotland's climate risk assessment toolkit](#) for major projects is freely available online and is currently being used by several major organisations to screen built-environment projects for climate risks.

As two examples of how Adaptation Scotland also supports local planning to manage risks:

- collaboration with Aberdeen City Council led to a city-wide [Aberdeen Adapts Strategy](#), approved in December 2019. The strategy was developed in collaboration with public, private and community sector stakeholders and included engagement with children, young people and community members from across the city.
- input from Adaptation Scotland to the Our Place In Time working group and Edinburgh Adapts initiatives is supporting the adaptation of Scotland's historic built environment.

Local government has a vital role to play in progressing community resilience. Adaptation Scotland has delivered training in collaboration with COSLA, as well as engaged on a one-to-one basis with local authorities, increasing understanding and supporting regional and local adaptation action. The Highland Council's support for the emerging Highland Adapts initiative, including a strong focus on community engagement, is one example of increased local authority engagement and action.

Finally, in support of the theme of placemaking, Adaptation Scotland is building capacity and driving innovation through a new place-based adaptation expert working group. The group brings together planners, climate change professionals, flood risk experts and community development specialists to share learning and accelerate progress.

Chapter 2: Progress towards “the people in Scotland who are most vulnerable to climate change being able to adapt and climate justice being embedded in climate change adaptation policy”

To improve the ability of people in Scotland to adapt to climate change, those who are more vulnerable must first be engaged and empowered in their own communities. The second chapter of SCCAP2 sets out policies to ensure that adaptation happens in a manner that is people-centred, fair and just.

When people are already vulnerable, climate change can have a compounding effect, worsening overall outcomes, particularly those associated with health and wellbeing. At present there is an immediate public health emergency in relation to the COVID-19 pandemic, but in the longer term it remains the case that everyone’s health can also be affected by climate change and those who are socially disadvantaged, older, very young or experiencing chronic health problems may be less able to cope.

Location and place can also be a factor in increasing vulnerability to the impacts of climate change, for example, for those who live in a flood prone area, or those who live in remote or island communities.

Examples of progress to policies in support of this outcome

Cleaner Air for Scotland Strategy – An online survey was undertaken between October and December 2019, to obtain views on the recommendations arising from the independent review of Cleaner Air for Scotland. The comments will be used to inform the development of a new Air Quality Strategy during 2020. The [final annual progress report](#) for the current version of Cleaner Air for Scotland was published in March 2020. Air quality is an important aspect of public health and action on this is interlinked with both climate change mitigation and adaptation.

NHS Board Climate Change Risk Assessments and Adaptation Plans – NHS National Services Scotland has developed a planning tool to enable NHS Boards to identify, assess and mitigate climate change risks, and to develop appropriate adaptation plans to ensure continuity of service. All NHS Boards will be expected to have a completed Climate Change Risk Assessment and Adaptation Plan by the end of 2021.

The Place Principle – The Place Principle was adopted by the Scottish Government and COSLA in March 2019. The Principle calls on those responsible for providing services and looking after assets in a place to work and plan together with local communities to improve the lives of people, support inclusive and sustainable growth and create more successful places that will be capable of adapting to climate change. The Cabinet Secretary for Communities and Local Government wrote to all Non-Departmental Public Body and public agency Chief Executives in August 2019 to encourage their adoption and consideration of how this would change the way they worked.

Walking and Cycling Networks: During the COVID-19 lockdown, the Scottish Government announced £10 million to support pop-up walking and cycling routes or temporary improvements to existing routes. Prior to this, Transport Scotland have

invested £7 million in the National Cycle network in 2019-20, delivering projects such as those on route 78 near Ledaig and Duror and on route 7 near Castle Semple.

Electric Vehicle Charging Network through ChargePlace Scotland: The use of electric vehicles helps to improve local air quality and therefore public health and wellbeing. The ChargePlace Scotland network now has over 1200 publically available charge points, an increase of over 350 since 2019.

How the Adaptation Scotland programme is supporting this outcome

Adaptation Scotland is collaborating with Public Health Scotland² to increase awareness of the links between health inequalities, climate change adaptation and climate justice. This work, targeted at public health professionals and those leading climate change adaptation policy and planning, highlights the differential impacts on health and wellbeing and the potential for co-benefits if action to adapt to climate change takes opportunities to improve health and reduce health inequalities into account. A briefing and accompanying report is expected to be published later in 2020.

Adaptation Scotland's [Adaptation Capability Framework](#) provides health boards with guidance on how to develop their work to adapt to climate change. The Framework is endorsed by NHS National Services Scotland and complements their specialist climate change risk assessment resources.

Adaptation Scotland has been working with the Scottish Government's Place Standard team to develop climate change questions and content that will be included in the revised Place Standard tool (see chapter 1). The new content will enable communities to discuss climate change impacts and adaptation as part of their local placemaking. The current version of the tool is already widely used and it will be important to encourage further use within vulnerable communities in particular.

Adaptation Scotland is committed to building capacity and supporting remote and island communities to adapt. New adaptation initiatives are currently being developed in the Highlands and Outer Hebrides in collaboration with local partners. These initiatives will lead to adaptation plans and actions that address local priorities.

² This work was initiated with NHS Health Scotland. On 1 April 2020 NHS Health Scotland became part of Public Health Scotland, Scotland's national public agency for improving and protecting the health and wellbeing of Scotland's people.

Chapter 3: Progress towards “our inclusive and sustainable economy being flexible, adaptable and responsive to the changing climate”

The COVID-19 pandemic represents a huge economic shock and the Scottish Government’s immediate focus is on supporting businesses under these circumstances.

Action on climate change adaptation, in the context of wider societal and economic resilience, will then form an important element of a green recovery from COVID-19. The [independent expert advice](#) published by the Committee on Climate Change on 6 May, which the Scottish Government has welcomed, identifies enhanced adaptation to climate change and the use of climate investments to support economic recovery and jobs as two of the key principles guiding a resilient recovery.

In the longer term, as the global climate continues to change, we remain committed to supporting all parts of the Scottish economy to adapt. Scotland’s nature-based industries will, in general, be the most directly impacted by climate change. For example, increased rainfall could lead to greater flooding of Scottish farms and damage to crops, changes in temperature of Scotland’s seas may impact Scotland’s fisheries, and Scotland’s forests may face new pests and diseases. Manufacturing, services, and other industries will face other challenges such as disruption to supply chains, difficult travelling conditions for staff, and water shortages for industrial processes. However, climate change may also offer opportunities for some Scottish businesses including the development of products and services for climate change adaptation, as well as improved productivity in the forestry and agriculture sectors.

In addition to the various Scottish Government policies set out below, action on adaptation is also being led at a local level through regional partnerships such as [Climate Ready Clyde](#) – which includes eight local authorities, SEPA, Transport Scotland, Strathclyde Partnership for Transport, Glasgow and Strathclyde Universities, SGN and NHS Greater Glasgow and Clyde. The initiative has recently secured new funding from the European Institute of Innovation and Technology’s Climate-KIC programme to catalyse a transformational approach to addressing the impacts of climate change in the Glasgow City region.

Examples of progress to policies in support of this outcome

Fair Work Charter for Severe Weather – The Scottish Government is continuing to promote the Fair Work Severe Weather Charter, encouraging all employers to adopt fair and flexible working practices to protect the health and wellbeing of the workforce and help avoid financial detriment to workers as a result of severe weather situations.

Farming For a Better Climate – A farmer-led soil regenerative agriculture network was established in May 2019. Throughout 2020 this network will continue to focus on positive actions that can be taken on Scottish farms to support, enhance and protect their soils. This will allow them to improve production whilst delivering wider benefits such as building soil resilience, improving water retention, storing carbon and enhancing bio-diversity.

Scotland's Forestry Strategy – 'Increasing the adaptability and resilience of forests and woodlands' is a priority within Scotland's Forestry Strategy 2019-2029. Since September 2019, we have been developing a Forestry Strategy Implementation Plan for 2020-2022, working in partnership with a range of forestry and land use interests, including members of a fixed-life stakeholder working group. Publication of the Plan, scheduled for April 2020, has been postponed due to the COVID-19 emergency. The content is being reviewed and many of the agreed collective actions remain relevant and will form the basis of a revised Implementation Plan, to be published in due course.

Future Fisheries Management Strategy – The discussion phase of a paper on the Future of Sea Fisheries Management ended in July 2019, following a series of successful stakeholder events. The analysis from this phase will now inform the development of a wider Future Fisheries Management Strategy due for publication later in 2020 and a consultation paper on specific policies will be published around the same time. The strategy will also consider the impacts of future climate change on Scotland's fisheries.

SME Loan Fund and Resource Efficient Scotland Support Service – In addition to specific packages of support for businesses during COVID-19, the Scottish Government's Resource Efficient Scotland Programme continues to support small- and medium-sized Scottish enterprises (SMEs) through the funded SME Loan Scheme. The scheme provides bespoke advice and support to SMEs in implementing energy and resource efficiency measures allowing for a reduction in energy consumption, carbon output and resource costs to businesses.

How the Adaptation Scotland programme is supporting this outcome

Adaptation Scotland's climate ready business guidance is available [online](#) and provides businesses with advice on how to adapt to climate change. The programme also sponsors an Adapting Scotland VIBES award to encourage and recognise business innovation around climate change adaptation.

Forestry and Land Scotland, responsible for managing Scotland's national forests and land, is playing a leading role in implementing Adaptation Scotland's [Adaptation Capability Framework](#). This is increasing its capacity to adapt to climate change and enabling other organisations to benefit from its knowledge and experience.

Looking to the future, increasing financial flows into adaptation will be crucial in order to deliver a step change in climate change readiness and resilience. Adaptation Scotland has established an adaptation finance expert working group to support the development and maturation of adaptation financing in Scotland.

Chapter 4: Progress towards “our society’s supporting systems being resilient to climate change”

Communities across Scotland depend on our infrastructure networks, encompassing the supply networks of energy, water, communications (including digital), roads and rail, and also the service delivery areas of government, health and emergency services.

Much of this infrastructure is critical, providing lifeline services to Scotland’s communities and businesses, particularly those located in Scotland’s remote Highlands and Islands. At present, many of these networks and services are heavily affected by the COVID-19 crisis and the immediate focus is on supporting them in this context. The Scottish Government is then committed to delivering a green recovery and infrastructure will be central to this. The [independent expert advice](#) published by the Committee on Climate Change on 6 May identifies, as one of its guiding principles for a resilient recovery, the importance during this phase of avoiding ‘lock-in’ to higher emissions or increased vulnerability to climate change impacts over the long term.

In Scotland, some parts of infrastructure are devolved to the Scottish Government, while some remain reserved to the UK Government. The present update focuses on progress in the devolved policy areas only. It is also noted that the built-environment is largely considered under chapter 1.

Progress on cross-cutting policies in support of this outcome

Infrastructure Commission and Infrastructure Investment Plan – The Infrastructure Commission published its first report – [A Blueprint for Scotland](#) – in January 2020, which calls on the Scottish Government to tackle the dual challenges of a climate emergency and creating an inclusive growth economy. The Commission is preparing a second report this year on the delivery of infrastructure. The Scottish Government has taken the decision to delay the publication of the Infrastructure Investment Plan (IIP) in light of the COVID-19 pandemic. The IIP will set out how we are using our investment to help us respond to the challenges of COVID-19, and the economic recovery that will be so important to us all. We will keep the publication date under review as the current situation progresses.

Examples of progress to transport policies in support of this outcome

The National Transport Strategy 2 – The second National Transport Strategy was published in February 2020 and sets out the future direction for transport in Scotland. The vision is that “we will have a sustainable, inclusive, safe and accessible transport system helping deliver a healthier, fairer and more prosperous Scotland for communities, businesses and visitors”. The Strategy and its policies will ensure that the resilience of the transport network is enhanced so that future transport projects deal effectively with predicted climate changes, and that the existing transport system is adapted to deal with increased rainfall, more frequent high winds and rising temperatures.

Scottish Road Network Landslide Study and Implementation Report – The review of recommendations for the Implementation Report is now complete. Mitigation works have continued at A83 Rest and Be Thankful and on selected A82 rock slopes. A programme of research into slope monitoring and landslide management has continued, again focussed on the A83 Rest and Be Thankful, with reports being published as they become available. A Quantitative Risk Assessment of the A82 Glencoe is in progress, with a report expected later this year. Following the success of the 2019 landslide workshop to disseminate research findings amongst key stakeholders, a further workshop is proposed when circumstances for such an event are more favourable.

Other Transport Scotland work in preparing for severe weather events – To improve incident management best practice, enhance road-worker safety and to improve roadside information, Transport Scotland is taking forward an action plan of installing Variable Message Signs at strategic locations on the trunk road network affected by high winds. Works commenced north of Inverness in 2019 in the first phase of our construction programme. We have also commissioned a strategic corridor assessment of the A1 in relation to high wind management alongside a full review of standard incident diversion routes within the South-East Unit.

Examples of progress to water policies in support of this outcome

Scottish Water Surface Water Policy – In June 2018, Scottish Water signed a Sustainable Growth Agreement with SEPA, under the terms of which they will work together to explore new and innovative ways to manage resilience in rural and urban drainage catchments. Through a partnership of Glasgow City Council, Scottish Canals and Scottish Water under the umbrella of the Metropolitan Glasgow Strategic Drainage Partnership, construction of Europe's first ever 'smart canal' commenced in May 2018. The project will use sensors, predictive weather technology and active management of the canal to lower water levels, creating space for surface water run-off. Scottish Water have also joined with SEPA, the Scottish Government and local authorities to form the Edinburgh and Lothians Strategic Drainage Partnership to develop innovative and integrated solutions to manage rainwater, flooding, flood risk and growth.

Blue-Green Infrastructure – The Scottish Government is working together with Scottish Water, SEPA, local authorities and other stakeholders under the Blue-Green Cities Programme for Government commitment to develop approaches to drainage which will reduce the burden on the sewerage systems and lessen surface water flooding. By retaining more water in watercourses and soils and developing above ground drainage networks, we can improve the environment, supporting biodiversity while increasing leisure and activity potential. We will build on examples of work underway in Glasgow and elsewhere to establish new pilots of the Blue-Green cities approach. The Social Housing and Green Infrastructure project is funded by the Scottish Government and SNH, and supported by Architecture & Design Scotland and the Scottish Federation of Housing Associations. Three pilots are developing designs that maximise the benefits of green infrastructure in social housing. The pilots will provide lessons for the wider housing sector around the design, integration and procurement of multifunctional green infrastructure and lead to more opportunities for people to connect with nature near where they live.

Private Water Supplies – Climate change means changes to rainfall amounts and distribution and a more frequent occurrence of prolonged dry periods such as that in 2018 and the one we are experiencing in spring 2020. The North East of Scotland, which has the greatest number of private water supplies, is at greatest risk of drought although other parts of upland Scotland are also at risk. Scotland has over 22,000 private water supplies which provide drinking water to nearly four per cent of the population. They are vital to many rural and remote communities. The Scottish Government has convened a working group (with meetings in January and April 2020) to advise Ministers on the measures that should be put in place to strengthen the resilience of these drinking water supplies.

Examples of progress to emergency services policies in support of this outcome

Scottish Fire and Rescue Service (SFRS) Climate Change Response Plan 2045

– Published in February 2020, the [Response Plan](#) sets out how the SFRS will respond to climate change in terms of supporting communities in adapting as well as reducing the service’s own carbon emissions.

Climate Hazards and Vulnerabilities Risk Screening Tool for Healthcare Assets

– The Toolkit was completed in February 2020 and will enable NHS staff, when appropriate, to identify the climate change risks associated with their key sites and also the surrounding infrastructure (e.g. road, railways, etc). It is expected that the application of the Risk Screening Tool will help NHS Boards in completing Climate Change Risk Assessment and Adaptation Plans (see chapter 2).

How the Adaptation Scotland programme is supporting this outcome

Both Transport Scotland and Scottish Water provided crucial input to support the development of the [Adaptation Capability Framework](#). Both organisations are now collaborating with Adaptation Scotland to implement the framework, benchmark progress and share lessons learned.

Adaptation Scotland also supported the Scottish Fire and Rescue Service in preparing the Climate Change Response Plan discussed above.

Chapter 5: Progress towards “our natural environment being valued, enjoyed, protected and enhanced and having increased resilience to climate change”

Scotland’s natural environment is globally renowned. Scotland’s peatlands, mountain landscapes, coastal cliffs and seas, machair and diversity of woodland ecosystems are exceptional by European standards. These environments support a fantastic range of species, as well as being key assets for health and wellbeing. A healthy natural environment is vital to our society and economy. Unfortunately, as has been highlighted in recent [global reports from the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services](#), our species and habitats are currently under threat, facing the twin challenges of climate change and biodiversity loss.

The fifth and sixth chapters of SCCAP2 set out policies to protect and improve the resilience of our natural environment in the face of these challenges. The present chapter relates mainly to the terrestrial environment, whereas chapter six relates mainly to the marine and coastal environment.

The approach in SCCAP2 builds on the strong focus in the first adaptation programme (2014-2019) on protecting Scotland’s much loved natural environment. Adaptation has been firmly embedded within the core work of the wider public sector, including a long track record at SEPA, SNH, Scottish Forestry, HES and Marine Scotland. In particular, SNH has developed a suite of eight adaptation principles which contribute to natural environment climate change adaptation work. These principles complement the sub-outcomes in SCCAP2.

Progress on cross-cutting policies in support of this outcome

Land Use Strategy –The 2019-20 Programme for Government set out a commitment to bring forward proposals around the development of regional land use partnerships and frameworks. The Scottish Government is now working closely with the Scottish Land Commission as we look to understand how best to deliver the partnerships in order to maximise integrated and sustainable land use at a local, catchment and landscape scale.

Scottish Biodiversity Strategy and Route Map – Ecosystem restoration has shown increased progress and collaboration. Green network expansion has been achieved through projects such as EcoCo which increased habitat connectivity in central Scotland ([final report](#) published in January 2020), as well as the Green Infrastructure Fund (covered below) and the related Community Engagement Fund. Large utilities companies in Central Scotland are following Crown Estate Scotland’s lead in using the Natural Capital Protocol to prioritise new investment in green infrastructure.

Examples of progress on policies in support of sub-outcome that: “Scotland’s biodiversity, ecosystems and landscapes are adaptable to the changing climate”

Scotland’s National Peatland Plan / Peatland Restoration Grants – The Scottish Government is investing over £250 million in peatland restoration over ten years, starting with £20 million in 2020-21. This funding demonstrates Scotland’s

commitment to nature-based solutions to the climate crisis and represents a step change in our commitment to protecting our habitats. It will enable large-scale restoration projects to be developed, enhancing biodiversity in some of the most important habitats in Europe and securing jobs in the rural economy. To date, we have already restored almost 20,000ha of peatland through our Peatland Action initiative.

Scottish Fire and Rescue Service (SFRS) work on wildfires – SFRS chairs the Scottish Wildfire Forum, a multi-agency group which has developed a strategy that seeks to reduce the instance of wildfires by promoting good practice, providing education and information and developing a shared understanding across all relevant sectors. This work has also provided assistance to the Scottish Government in developing the Scottish National Risk Assessment for Wildfires, which will appear in Scotland’s Risk Preparedness Assessment. SFRS is also participating in the EU HEIMDALL Project, which combines earth observation and ground sensor data to allow for predictions on where and when wildfires might occur. A further update on the SFRS Climate Change Response Plan was included in chapter 4.

Biodiversity Challenge Fund – During its first round in 2019, the Fund granted over £2.5 million to 21 projects delivering over two years. To date there has been notable progress in those projects delivering native tree planting to enhance the resilience of ecosystems while also sequestering carbon. Other examples of progress include the creation and restoration of habitats in the Forth Valley to boost the resilience of amphibians, reptiles and other wildlife populations.

Pollinator Strategy for Scotland 2017-2027 – Reporting on activity from this SNH-led strategy over the whole of 2019 shows progress across all objectives, notably:

- Over 30 habitat creation and enhancement projects such as park schemes (Falkirk), roadside verges (Stirling and Argyll & Bute), and local authority Pollinator Plans (e.g. Glasgow & North Lanarkshire);
- 11 projects on understanding pollinators and the benefits they bring, ranging from courses and guidance for communities (e.g. Butterfly Conservation) to research work informed by counts and surveys from the UK Pollinator Monitoring Scheme;
- 17 projects increasing awareness and action, such as guidance and resources from NGOs and SNH, and the Edinburgh Living Landscape initiative.

Examples of progress on policies in support of sub-outcome that: “Scotland’s natural environment and its contribution to wider societal adaptation is enjoyed, valued and maintained”

Outdoor Learning in Nature – The Learning in Local Greenspace project had, by Autumn 2019, exceeded the target of improving 100 green spaces for play and outdoor learning, engaging 115 schools from 12 local authorities.

Our Natural Health Service Programme – With £3 million of funding from the Scottish Government, NHS Scotland health boards and the Green Exercise Partnership, the first stage of the NHS Greenspace demonstration project (2012-2019) has supported greenspace interventions being delivered at 13 sites across ten mainland health boards. A [final report](#) from the project was published in April 2020. The Partnership has also provided assistance to each health board to undertake

landscape assessments, appraisals and ‘master planning’ of the estate to develop priorities for the future. In total, across a diversity of primary and secondary health and care settings, delivered by each of the health boards, greenspace improvements have been delivered across 87 hectares of the NHS estate.

Green Infrastructure Fund – There are seven phase one projects (around £20 million total investment) in this SNH-led [fund](#). The first two are complete, with the others due to finish during 2020. Through the Placemaking Principle, sites have been designed to truly benefit the community and provide space for nature. They form nature-based solutions, addressing adaptation and resilience through, for example, flood mitigation, habitat creation, enabling active travel and access to quality greenspace, and community food growing. The sites already attract heavy use, with resounding positive feedback, further evidencing the need for this type of intervention. They have attracted international interest in how Scotland is using multi-functional greenspace for adaptation, delivering for nature and people simultaneously and successfully.

Updates relevant to the SCCAP2 proposal for a National Monitoring Strategy – SNH has further promoted the development of two new world-leading Ecosystem Health Indicators, which use mosses and liverworts to measure how biodiversity is affected by changes in summer temperature and nitrogen pollution. The data largely comes from volunteer citizen scientists. The [State of Nature Scotland report](#) was published in October 2019 as a collaboration between NGOs, SNH and the Scottish Government. The report covers marine and terrestrial climate change impacts, with most data again collected by citizen scientists.

How the Adaptation Scotland programme is supporting this outcome

Adaptation Scotland is collaborating with SNH and Scottish Forestry to support the implementation of the [Adaptation Capability Framework](#). They are further collaborating with SNH in their role leading the climate change group of the Outer Hebrides Community Planning Partnership, which will lead to an adaptation plan for Outer Hebrides.

Chapter 6: Progress towards “our coastal and marine environment being valued, enjoyed, protected and enhanced and having increased resilience to climate change”

Scottish waters are a special place for marine habitats and wildlife thanks to the unique combination of our position at the edge of the European continental shelf, Scotland’s long coastline and large area of sea. and the mixing of warm Gulf Stream currents and cold currents. Coastal habitats including sand dunes, cliffs, saltmarsh and saline lagoons are also a very big part of the Scottish landscape.

Scotland’s coastal waters are in good ecological condition. Targets to designate ten per cent of coastal waters as protected areas have already been met. However, as climate change increases pressures on our coastal and marine environments, it is important that we keep working to protect and support these areas in order to protect this good ecological status and the ecosystem services which depend upon it.

Examples of progress on policies in support of this outcome

Scotland’s Marine Atlas – Through the work of Scotland’s Seas Data and Assessment Group, the Scottish Marine Assessment 2020 has made considerable progress in the development of a wide range of assessments reporting on Scotland’s vision for the seas. The external peer review process is currently underway and the final outputs are intended to launch later in 2020.

Dynamic Coast 2 – This project, which is expected to be launched in late 2020, will consider the impacts of future erosion along our coastline, taking sea level rise forecasts into consideration. It will then identify lengths of coastline most likely to be impacted by climate change, the assets at risk, assets being protected by nature and identify adaptation strategies at seven super sites.

Monitoring Climate Change Impacts in Scottish Seas – To help inform future policy development, Marine Scotland gathers data on the impact climate change is having within Scottish seas. This includes data from the Scottish Coastal Observatory (a network of coastal monitoring sites where measurements are made by Marine Scotland and volunteers). These data are currently undergoing quality assurance prior to publication by autumn 2020. Physical conditions in Scottish waters further away from the shore are measured by ship-based surveys. The time series of key indicators based on these surveys has been submitted for inclusion in the International Council for the Exploration of the Sea Report on Ocean Climate, due for publication in September 2020.

Marine Climate Change Impacts Partnership (MCCIP) – MCCIP is a partnership of UK governmental and academic organisations that compile and publish assessments of climate change and climate change impacts in UK marine waters, as well as providing climate adaptation advice through its [Climate Smart Adaptation](#) initiative. The latest MCCIP product is the [Marine Climate Change Impacts Report Card 2020](#), which summarises the latest evidence from 26 topics regarding the physical, ecological, social and economic impacts of climate change on UK coasts and seas, both current and future, based on latest climate change projections. The key headlines of the 2020 report include evidence that warming seas, reduced oxygen, ocean

acidification and sea level rise are already affecting UK coasts and seas. Increasingly, these changes are having an impact on food webs, with effects seen in seabed-dwelling species, as well as plankton, fish, birds and mammals.

Marine Protected Areas (MPA) Network – In order to comply with national, European, and international obligations there is now an extensive MPA network which covers 22 per cent of Scotland’s seas. The network has evolved over the last 25 years and work continues to complete site designations, implement management measures and deliver a monitoring programme. Preparatory actions to designate four additional MPAs for mobile species, Special Protection Areas for Seabirds and the West of Scotland Deep Sea Marine Reserve are all nearing completion. Management measures for phase two inshore MPAs and Priority Marine Features outside of MPAs, including blue carbon habitats, are also currently being developed and will go out to public consultation in due course.

Crown Estate Scotland – In April 2020, Crown Estate Scotland published their [Corporate Plan for 2020-2023](#) which includes climate change adaptation (and mitigation) as an investment criterion.

How the Adaptation Scotland programme is supporting this outcome

The Adaptation Scotland programme is represented on the steering groups for the Dynamic Coast project and the Marine Climate Change Impacts Partnership.

Chapter 7: Progress towards “our international networks being adaptable to climate change”

The Scottish Government places great importance on Scotland being a good global citizen. This means taking a leading role in tackling climate change and also playing our part in other global challenges including poverty, injustice and inequality. We recognise that climate change adaptation requires international cooperation and also, as part our commitment to championing climate justice, that those who experience the greatest impacts may need more support to adapt.

In line with the aims of the Scottish Government's [International Framework](#), we will share our experiences, values and expertise on matters such as climate change adaptation with other countries, with a view to seeing the human rights of people across the world fully realised. Exchange of learning and knowledge will support countries to adapt, with positive indirect benefits for international governance and global political stability. We also want to learn from our international partners, ensuring that Scotland has the best possible evidence informing our adaptation action.

We engage with international partners on adaptation through a range of channels, including the British Irish Council and the RegionsAdapt initiative. At a global level, Scotland supports the UN Paris Agreement on climate change, which puts a strong emphasis on adaptation and resilience, as well as the urgent need to reach net-zero global emissions of greenhouse gases.

Examples of progress on policies in support of this outcome

Climate Change (Emissions Reduction Targets) (Scotland) Act 2019 – While the principal focus of this legislation was around mitigation, it includes a provision to ensure that future Scottish climate change adaptation programmes “must include an objective in relation to Scotland’s contribution to international climate change adaptation in line with international best practice.”

RegionsAdapt – In October 2019, the Scottish Government signed an Adhesion Declaration to join the global RegionsAdapt initiative which was created alongside the 2015 Paris Climate Conference (COP21) as a framework for regional governments’ action, collaboration and reporting on climate change adaptation. It facilitates the development of joint solutions to climate change adaptation, and promotes cooperation, knowledge sharing and sharing of best practice.

Climate Justice Fund / Climate Justice Innovation Fund – The Scottish Government’s Climate Justice Fund continues to provide support to people in Malawi, Rwanda and Zambia who are among the most vulnerable to climate change due to a range of intersectional factors. Since September 2019, three additional projects have been funded by the Climate Justice Innovation Fund to explore new innovations in climate resilient food provision, water access and renewable energy, with a view towards scaling these up in the future.

Climate Challenge Programme Malawi – The third year of this programme has now commenced and further activities in southern Malawi have sought to develop the community-led climate resilience projects undertaken in the previous two years. In

In addition to this, advocacy activities have been undertaken to bring the voices of vulnerable rural Malawians to the decision-making table at regional and national levels to influence decision-makers to include those who are most vulnerable to the effects of climate change in their climate change policy.

2050 Young Malawian Climate Leaders – The second year (2019-20) of the Malawi Climate Leaders project has led to the training of a further 20 young Malawians to be advocates for strong action on climate change among their peers, in their communities and in local and regional government. Cultural exchanges and workshops have deepened links between climate activists in Scotland and Malawi and helped them develop a shared ambition to tackle the global climate emergency.

How the Adaptation Scotland programme is supporting this outcome

Adaptation Scotland collaborates with a range of international partners to share learning on adaptation and ensure that Scotland's own approach is informed by international best practice. In November 2019, Adaptation Scotland's work on place-based adaptation was showcased at COP25 in Madrid in collaboration with the Government of Ireland.

Adaptation Scotland's [Adaptation Capability Framework](#) has been recognised by international partners as an exemplar approach to developing adaptation in major organisations and is informing similar approaches around the world including in Canada, Australia and Ireland.

Chapter 8: Progress to SCCAP2 research commitments

Building the evidence base around climate change adaptation through research is vital to guide policy and support the high-level outcomes set out in SCCAP2 for communities, businesses and the natural environment. Across five of the seven outcomes in SCCAP2, a total of 25 commitments to undertake research projects were included. This programme of work will enhance our knowledge of climate risk and provide proposals for innovative ways in which Scotland can adapt to the changing climate.

The SCCAP2 research programme builds from a wide range of already completed research under the previous programme, a summary of which can be found within SCCAP2 itself. The following are just two examples of the previous work, i) a series of [soil risk maps](#) to help farmers identify areas vulnerable to erosion, compaction, leaching and runoff, and ii) a [framework](#) developed by ClimateXChange (CXC) for gathering the evidence on climate risks required to estimate the extent to which Scottish businesses are exposed to climate-related hazards.

This chapter identifies key areas of progress on the SCCAP2 research programme since its publication in September 2019.

The following pieces of research have been completed and published:

- In October 2019, Historic Environment Scotland published a [Guide to Climate Change Impacts on Scotland's Historic Environment](#). This can be used to identify and share climate change adaptation solutions and many of the risks and hazards of climate change that are facing Scotland's historic environment. It offers owners, local communities and carers of historic sites options for action to implement adaptation measures and enhance resilience to climate change.
- In November 2019, the Plant Health Centre published the [final three reports](#) in its series of research into plant pests and their behaviour under different climate scenarios. The project uses modelling to investigate the effectiveness of national surveillance monitoring aimed at detecting a *Xylella fastidiosa* outbreak in Scotland.
- In December 2019, CXC published a [report](#) assessing the use of managed adaptive flood risk planning in Scotland, in the context of increasing and uncertain risks relating to climate change. Drawing on Scottish case study evidence, it presents eight key recommendations for how guidance can be changed to facilitate more adaptive approaches in cases where this can be valuable.
- In February 2020, the Centre for Expertise on Waters (CREW) published a [report](#) on the long-term impacts of flooding, following the 2015/16 floods in North East Scotland. The report identifies key findings on the impact on people and businesses and recommends measures to be taken before, during and after incidences of flooding.

The following CXC research projects are currently underway:

- A project on a case study approach to identify the impact climate change is having on social care delivery. The study looks at how the social care sector is currently planning for, dealing with and learning from extreme weather events and incremental climate change. The project is in its final draft stage.
- Researching methods and data sources to assess recovery from extreme weather events by comparing international recovery monitoring frameworks and assessing their suitability in Scotland. The drafting of this report is in its final stages and will make recommendations covering key monitoring categories in the international examples; social, human, financial and physical capital.
- A project on reviewing current sources of information on soil health and its vulnerability to climate change.
- A study to provide a baseline for uptake of property flood resilience in Scotland. It will also form the basis for a separate project to identify how home owners and businesses can be encouraged and enabled to protect their properties from flooding.

In addition to the above projects from the SCCAP2 research programme, a further development has been publication, in March 2020, of an [economic research study](#) commissioned by the Climate Ready Clyde initiative (with funding from the Scottish Government) on the economic and financial risks of climate change for then Glasgow City Region. This evidence will inform the Climate Ready Clyde Climate Change Adaptation Strategy, due for publication during 2020-2021.

The remaining commitments for future research projects highlighted in SCCAP2 will be progressed during the remainder of the five-year implementation period for the programme. In addition, new research priorities will continue to be identified and the findings arising from ongoing and completed projects will be disseminated and incorporated into adaptation policy where appropriate.

Annex: Summary of risk assessment for Scotland from UKCCRA2

The UK Government is required under the 2008 UK Climate Change Act to publish a UK wide Climate Change Risk Assessment (UKCCRA) every five years, assessing the ‘risks for the UK from the current and predicted impacts of climate change’. The [second UKCCRA](#) was published in 2017.

Prior to this, in 2016, the Committee on Climate Change published its Evidence Report and Synthesis Report, including a [National Summary for Scotland](#), which provides the underpinning for the UKCCRA. Some actions identified as priorities for other parts of the UK have been shown to have a different urgency category for Scotland.

The Evidence Report used the concept of urgency to summarise the findings of the analysis, variously identifying ‘more action needed’, ‘research priority’, ‘sustain current action’ and ‘watching brief’ categories. For Scotland, it highlighted:

- The need for more action to address flood risks;
- The potential for water scarcity;
- Heat related impacts on health and wellbeing;
- Risks to the natural environment;
- Risks of food price volatility; and
- New and emerging pest and disease risks, especially for Scotland’s forestry.

Table: UK Climate Change Risk Assessment: risks summary

Flooding and coastal change risks to communities, businesses and infrastructure (Ch3, Ch4 Ch5, Ch6)	MORE ACTION NEEDED
Risks to health, well-being and productivity from high temperatures (Ch5, Ch6)	
Risk of shortages in the public water supply, and for agriculture, energy generation and industry (Ch3, Ch4, Ch5, Ch6)	
Risks to natural capital, including terrestrial, coastal, marine and freshwater ecosystems, soils and biodiversity (Ch3)	
Risks to domestic and international food production and trade (Ch3, Ch6, Ch7)	
New and emerging pests and diseases, and invasive non-native species, affecting people, plants and animals (Ch3, Ch5, Ch7)	RESEARCH PRIORITY
NOW -----> RISK MAGNITUDE -----> FUTURE LOW MEDIUM HIGH	

Source - Adaptation Committee (of the Committee on Climate Change)

The SCCAP2 programme responds to these priority risks within its outcomes-based framework. A list of the specific identified risks being addressed by the policies in each chapter can be found at the end of each chapter of SCCAP2.

Looking further ahead to the next statutory cycle of risk assessment and adaptation planning, the Committee on Climate Change is currently working on its updated Evidence Report to underpin the next (third) UKCCRA. The Evidence Report is due in summer 2021, in advance of the UKCCRA in January 2022. That risk assessment will then in turn inform the development of the third Scottish Climate Change Adaptation Programme for publication in 2024.



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This publication is available at www.gov.scot

Any enquiries regarding this publication should be sent to us at
The Scottish Government
St Andrew's House
Edinburgh
EH1 3DG

ISBN: 978-1-83960-751-6 (web only)

Published by The Scottish Government, May 2020

Produced for The Scottish Government by APS Group Scotland, 21 Tennant Street, Edinburgh EH6 5NA
PPDAS730866 (05/20)

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