Scottish National Adaptation Plan 2024-2029 Strategic Environmental Assessment

Environmental Report

Scottish Government

Final report

Prepared by LUC

January 2024

Version	Status	Prepared	Checked	Approved	Date
1	Draft	R Myerscough, E Hynes, O Tugulea, H Ennis, S Underwood	S Underwood	S Underwood	23/01/2024
2	Revised draft	R Myerscough, O Tugulea, S Underwood	S Underwood	S Underwood	05/02/2024
3	Final			S Underwood	9/02/2024

Land Use Consultants Limited
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Introduction to the Draft Scottish National Adaptation Plan

Climate change policy in Scotland responds to both a UK and Scottish framework. There are two key pieces of legislation: the UK Climate Change Act 2008 **[See reference** 1**]** and the Climate Change (Scotland) Act 2009 **[See reference** 2**]**. The UK Act requires a Climate Change Risk Assessment (CCRA) every five years. It is the basis for adaptation policy in both Scotland and the UK.

The Climate Change (Scotland) Act 2009 requires the preparation of strategic plans for climate change adaptation. These reports are required to be prepared as soon as reasonably practicable after the publication of each CCRA.

The most recent CCRA was published in 2022. The publication of the statutory CCRA triggered the duty on Scottish Ministers under the Climate Change (Scotland) Act 2009 to begin the process of developing the next climate change adaptation plan. The Scottish National Adaptation Plan therefore addresses the risks set out in the third CCRA.

The first Scottish Climate Change Adaptation Programme was released in May 2014, followed by Climate Ready Scotland: Second Scottish Climate Change Adaptation Programme 2019-2024 which was published in September 2019 **[See reference** 3**]**. Once adopted the Scottish National Adaptation Plan 3 (SNAP3) will replace the current adaptation programme.

SNAP3 is structured around five main outcomes and 22 objectives. The five outcomes set out adaptation action for:

- Nature Connects: Nature connects across our lands, settlements, coasts and seas
- Communities: Communities creating climate-resilient, healthy and equitable places.
- Public Services and Infrastructure: Public services are collaborating in effective, inclusive adaptation action.
- Economy, Business and Industry: Economies and industries are adapting and realising opportunities in Scotland's Just Transition.
- International Action: Scotland's international role supports climate justice and enhanced global action on climate adaptation.

Each outcome has its own set of objectives which define how the Scottish Government will measure delivery of adaptation actions. They provide the structure around which the Adaptation Monitoring Framework is being built. The objectives are supported by a series of proposed policies. In addition, SNAP3 reflects the need for actions that cut across all five outcomes including:

1. Ensure the Adaptation Plan reinforces other key policy areas, like the Climate Change Plan
2. Effective partnership and collaboration with delivery partners
3. Development of a climate-smart workforce and skills
4. Scaled-up private investment.

What is Strategic Environmental Assessment?

Strategic Environmental Assessment (SEA) is a way of considering the environment when preparing public plans, programmes and strategies. It identifies potential significant environmental effects and, where necessary, describes how these effects can be avoided or reduced. Through consultation,

SEA also provides an opportunity for the public to express their views on proposed policies and their potential environmental impacts.

In this case, SEA is being used to assess the likely environmental effects of the Draft Scottish National Adaptation Plan.

How was the Strategic Environmental Assessment undertaken?

This SEA is an assessment of the likely significant environmental effects of the draft SNAP3 and the alternatives to it. The Environmental Report considers the environmental effects of the draft SNAP3 as they would influence activities across Scotland.

The assessment identifies positive and negative environmental effects and the significance of these; considers whether they would be temporary or permanent; and notes where they would arise in the short, medium or long term. It also distinguishes between effects arising directly from the draft SNAP3 and any ‘secondary’ effects, which would indirectly impact on the environment.

Which reasonable alternatives have been considered?

The 2005 Act requires that the likely significant environmental effects of reasonable alternatives of a plan, programme or strategy are assessed as part of the SEA process.

Consideration of alternatives was undertaken in discussion with the Consultation Authorities. The extent to which alternatives for the third Scottish National Adaptation Plan (SNAP3) could be considered ‘reasonable’ was

influenced by the following factors: the legislative framework for the document; the significant proportion of committed policy and action embodied in the document; the share of policies and proposals focussed on improving the evidence base to inform future adaptation; and the uncertainty associated with some of the climate change impacts.

The Scottish Government identified the alternative option of Additional private investment funding which would combine action from the public and private sector. This approach is not preferred as it would depend on additional private sector investment which is outwith the control of Scottish Ministers creating a delivery risk, and is also subject to the current economic pressures on many businesses already during the post-Covid recovery period.

The Climate Change Committee recommended an outcome-based approach is used in SNAP3 which illustrates what the programme aims to accomplish. Other approaches were considered early in the process prior to, during and after policy development. This included taking a hazard-based approach, and structuring the document around hazard categories. This approach is not preferred given the strong likelihood for climate hazards to be cascading or compounding in nature which a single-hazard approach may struggle to adequately address. This also takes focus away from slower onset climate-related risks which may not be categorised by one or more individual events such as higher than average temperatures affecting growing seasons, for example. The alternative of taking **a sector-based approach** would consider the adaptation needs from the perspective of each particular economic sector in Scotland and meet the needs of sector concerned. This alternative would not be preferred as it is considered likely to lead to higher costs and lower benefits as it would not provide the opportunity for synergies between sectors and lead to siloed action. Several sectors also largely rely on matters reserved to the UK Parliament making it difficult for the Scottish Government to balance efforts across sectors.

Other alternative options considered included a ‘do nothing’ scenario, which was not identified as reasonable given the Climate Change (Scotland) Act 2009 requires the preparation of a strategic programme for climate adaptation

following the latest UK Climate Change Risk Assessment. The final option of taking a risk-based approach is based on responding to the 61 risks identified in the UK CCRA directly, addressing each one individually. However, as the risks within the UK CCRA are not Scotland-specific, for example, those covering reserved areas such as foreign policy and migration, dependence on a risk-based approach in this way which focuses only on some of the risks was not identified as a reasonable alternative.

What are the key environmental challenges relevant to the Draft Scottish National Adaptation Plan

In terms of climatic factors, Scotland's total emissions of the seven greenhouse gases (GHGs) in 2021 were estimated to be 41.6 million tonnes of carbon dioxide equivalent ($MtCO_2e$), an increase of 2.4% from 2020 **[See reference** 4**]**. The main contributors to this increase between 2020 and 2021 were from domestic transport, and from the residential sector following the impact of the Covid-19 lockdown. However, a 49.2% reduction in estimated GHG emissions between 1990 and 2021 was also reported. The most significant contributor to this overall reduction was energy supply emissions (such as power stations), with a reduction of 16.8 $MtCO_2e$ (77.6%). This was followed by reductions in emissions from 'Land use, land use change and forestry' (LULUCF) of 5.7 $MtCO_2e$ since 1990 and a reduction in emissions in waste management emissions (such as landfill) by 5.0 $MtCO_2e$ (76.2% reduction) since 1990 **[See reference** 5**]**.

In terms of population and human health, the estimated population of Scotland in 2022 was 5.4 million **[See reference** 6**]**. Projections forecast that the population will continue to rise and will peak at around 5.53 million in 2033. Approximately 83% of Scotland's people live in urban areas, which accounts for just 2.2% of Scotland's land surface **[See reference** 7**]**. Key findings from the 2020 Scottish Index of Multiple Deprivation show that 14 areas have been

consistently among the 5% most deprived in Scotland since the 2004 Index **[See reference** 8**]**.

Air pollution can result in adverse impacts on human health and can significantly affect many aspects of quality of life. The quality of the air around us is affected by the pollutants released into the atmosphere through human activities. Sulphur dioxide, oxides of nitrogen, particulates, and low-level ozone are generally considered to be of most importance in relation to human health and the environment.

In terms of soil and geology, it is estimated that Scotland's soils contain over 3 billion tonnes of historic carbon, making up over 53% of the UK's soil carbon. Degraded soil can act as a net carbon emitter, soils in good condition protect the carbon store and, depending on the vegetation cover, can continue to sequester carbon. Land use change and management practices can impact significantly on soil carbon stores and sequestration. Peatlands are of particular importance for mitigating climate change by acting as carbon 'sinks'. Approximately 1.6 billion tonnes of the carbon stored in Scottish soils is within peat. It is estimated that over 80% of Scotland's peatlands are degraded **[See reference** 9**]**.

There have been significant improvements to water quality alongside significant reductions in pollution. Most of Scotland's seas, coasts, and estuaries are in good or excellent condition. Around 80% of Scotland's groundwater is in good condition, although there are particular regions with widespread problems; for example, in the Central Belt **[See reference** 10**]**. Agriculture and the legacy of industrial activity are the main causes of regional-scale groundwater pollution problems. Flooding can have significant and long-lasting impacts on people, communities, and businesses. Flood Risk Management Strategies co-ordinate action to tackle flooding in Scotland. Scotland's peatlands play an important role in natural flood management. Woodland and forestry can help prevent flooding by intercepting precipitation, reducing surface water runoff through increased infiltration, and increasing the use of water through evapotranspiration.

In terms of biodiversity, flora and fauna, Scotland's protected areas include 243 Special Areas of Conservation (SACs) **[See reference** 11**]**, 162 Special Protection Areas (SPAs) **[See reference** 12**]**, 51 Ramsar sites **[See reference** 13**]** and two Biosphere Reserves **[See reference** 14**]**. There are further national level designations including 1,422 Sites of Special Scientific Interest (SSSIs) **[See reference** 15**]** and 247 Marine Protected Areas **[See reference** 16**]**. The UK Biodiversity Action Plan identified 39 priority habitats and 197 priority species in Scotland. By May 2023, the proportion of nationally protected nature sites reported as being in a "favourable" condition decreased by 1.4% from 77.9% in 2019 to 76.4%. Despite this decrease, this represents a stable trend since the current protocols were established in 2007 (0.4% increase from 76.0%) **[See reference** 17**]**.

Scotland's historical sites are unique and irreplaceable. While these assets are distributed widely throughout Scotland there are clusters of sites in and around our settlements and also around our coastlines. As of 2018, it is estimated that there are around 56,000 protected places across Scotland **[See reference** 18**]**. However, whilst most of the historic environment is undesignated (90-95%), these known but undesignated assets provide important contextual information which helps us better understand designated sites.

Scotland's distinctive landscapes are a significant part of the country's natural and cultural heritage and make a significant contribution to both the country's economic performance and the well-being of its people. There are currently two National Parks (Loch Lomond and the Trossachs, and the Cairngorms) and 40 National Scenic Areas in Scotland. Over 13% of Scotland's land area has been classified as a National Scenic Area **[See reference** 19**]**.

Scotland's natural resources are also material assets. Mineral resources and aggregates are used for purposes such as fuel, and construction.

Heating makes up approximately half of Scotland's energy consumption (50.3%) compared to transport (24.5%) and electricity (21.1%) making up approximately a quarter each **[See reference** 20**]**. Renewable electricity

generation is now equivalent to approximately 97% of Scotland's gross electricity consumption **[See reference** 21**]**.

In the first half of 2023, 78% of all renewable electricity generated in Scotland was from wind **[See reference** 22**]**. Hydro is Scotland's second highest source of renewable generation, while solar capacity has increased rapidly in the first half of this decade **[See reference** 23**]**. Bioenergy and energy from waste accounts for 8.3% and whilst the current capacity of wave and tidal is considered to be relatively small, technology is developing **[See reference** 24**]**. Since 2000, Scottish renewables have displaced an estimated 124 million tonnes of CO_2 **[See reference** 25**]**, assuming that the same amount of electricity generation would have been generated by fossil fuels **[See reference** 26**]** In 2007 alone, Scottish renewable electricity displaced an estimated 11.6 million tonnes of CO_2 **[See reference** 27**]**.

Which existing environmental protection objectives are relevant?

There are many established environmental protection objectives which form the context for the assessment. These include: international and national level policies and strategies that aim to protect and enhance the environment; climatic objectives focused on reducing Scotland's greenhouse gas emissions to net zero by 2045; objectives for population and human health aiming to prevent or limit exposure to environmental harm and nuisance such as air pollution, especially in urban areas; objectives for water and air aiming to reduce pollution, and to reverse the effects of past emissions; soil and geology objectives seeking to protect prime quality agricultural land and valuable soil resources including the protection of peatlands and remediation of contaminated land; biodiversity objectives focused on protecting habitats and species from damage and disturbance and improving natural heritage networks; cultural heritage objectives ranging from the protection of World Heritage Sites and Marine Protected Areas, to the recognition and management of more locally important buildings and archaeology, and their wider setting; landscape

objectives reflecting the importance of all landscapes and the need to help to improve those that have become degraded; objectives for material assets seeking to contribute to the core planning objective and supporting sustainable development, reducing greenhouse gas emissions, and making the best use of Scotland's resources and existing infrastructure.

Strategic Environmental Assessment findings

Climate change mitigation

Many of the outcomes and subsequent objectives and actions within SNAP3 are likely to have benefits for climate change mitigation by reducing greenhouse gas emissions within Scotland.

A number of objectives and actions, particularly through the objectives under Outcome 1: Nature Connects, support enhancements to and the creation of green infrastructure which could include additional tree cover and habitat and peat restoration. This will improve the management of soils which could have a positive impact on reducing emissions from soils, including peatland, and increasing the sequestration of greenhouse gas emissions. The objectives and actions include the enhancement and restoration of blue carbon spaces. There is potential synergy between the objectives in Outcome 1 and the Outcome 2: Communities preparation and response objective as it supports the reduction in wildfires which could reduce the potential for loss and damage of trees and woodland planted through the actions within the objectives of Outcome 1.

Objectives through Outcome 2: Communities support local climate change related issues awareness and partnership working which can also have positive impacts on reducing greenhouse gas emissions.

In addition, objectives such as ‘Power assets and the energy system’ and ‘Transport system’ support a transition to net zero which could increase the use of renewable energy and therefore, reducing the levels of greenhouse gas emissions released through energy and transport use. Furthermore, objectives and actions under Outcome 4: Economy, business and industry support improving awareness of climate change and helping businesses prepare to adapt to a changing climate. This will support a transition to net zero within businesses and the Scottish economy, lowering the future contributions to climate change.

Overall, minor positive cumulative effects are identified for climate change mitigation with notable benefits found within the objectives under Outcome 1: Nature Connects, Outcome 2: Communities and Outcome 4: Economy, Business and Industry.

Climate change adaptation

All of the objectives and actions within the Scottish National Adaptation Plan will contribute towards climate change adaptation. A large number of significant positive effects are expected in relation to climate change adaptation particularly within the objectives and actions in Outcome 1: Nature Connects, Outcome 2: Communities and Outcome 3: Public Services.

Several of the objectives and subsequent actions support enhancements to and the delivery of new green and blue infrastructure. Green infrastructure can provide a natural solution to adapting to the adverse effects of climate change such as severe weather which could include flooding and increasing temperatures. Green infrastructure within urban areas can offer areas for shading and cooling as temperatures are expected to rise as a result of climate change. In addition, enhancing green infrastructure and the provision of new tree cover and peatland restoration works could have secondary benefits for biodiversity, flora and fauna, increasing connectivity which could help wildlife adapt to climate change and increase resilience. All the objectives and actions

within Outcome 1: Nature Connects support enhancements to and the creation of new green infrastructure.

In addition, a number of the objectives and subsequent actions support collaborative and partnership working at a national and international scale to support adapting to climate change, particularly in relation to extreme weather events. This will help ensure that knowledge on best practice is shared and there is a co-ordinated approach to climate change adaptation. In particular, the 'A global hub for adaptation research' objective aims to reduce the loss and damage associated with the adverse effects of climate change such as extreme weather events and supports international knowledge sharing. A number of objectives and subsequent actions also support the creation of national plans and programmes to help with adapting to climate change within communities, businesses and creating more resilient infrastructure. This will have secondary benefits for population and human health and material assets. In particular, the objectives and actions under Outcome 3: Public Services aim to create resilient essential infrastructure such as health and social care, transport and drainage systems against the adverse effects of climate change. This will reduce the risk of damage to key infrastructure as a result of climate change. This is further supported by the objectives and subsequent actions under Outcome 4: Economy, Business and Industry which deals with supporting the resilience of businesses, agriculture and the economy to the effects of climate change and helping these areas adapt. This will also likely increase the uptake of climate change adaptation measures across a variety of business sectors creating a more resilient economy. Overall, significant positive cumulative effects are identified for climate change adaptation.

Biodiversity, flora and fauna

Many of the outcomes and subsequent objectives and actions within SNAP3 are likely to have positive effects for biodiversity, flora and fauna in Scotland. The objectives under Outcome 1: Nature Connects generally result in significant positive effects.

Several objectives and actions support the enhancement of habitat networks, habitat restoration and increased blue and green infrastructure investment. There are also objectives and actions which support tree planting and woodland creation and restoration. These will benefit biodiversity, flora and fauna by supporting adaptation to climate change and providing enhanced habitats and connectivity between habitats. In particular, the 'Marine ecosystems and the blue economy' objective support enhancements to the marine environment which will have a positive impact on marine wildlife and ecosystems. This is supported by the 'A global hub for adaptation' research objective which aims to help understand the effects of loss and damage on biodiversity and ecosystems, allowing better understanding of how to address this, and providing adaptation measures to reduce any further impact.

There is the potential for positive secondary effects for biodiversity, flora and fauna through objectives and actions that support climate change mitigation and adaptation. This is likely through objectives and actions which include woodland creation, improving the marine environment and habitat creation through rewilding. This is likely within the objectives and actions under Outcome 2: Communities. Although some minor negative effects are identified, overall, significant positive cumulative effects are identified for biodiversity, flora and fauna.

Water

Many of the outcomes and subsequent objectives and actions within SNAP3 are likely to have positive effects for water in Scotland. The objectives under Outcome 1: Nature Connects generally result in significant positive effects.

Positive effects on the water environment will likely arise from addressing flood resilience and coastal change, managing water scarcity, expanding blue and green infrastructure, expanding landscape scale interventions, and supporting freshwater habitats. These actions will reduce flood risk, improve water quality and temperature, and improve the management of water levels, reducing the

incidences of low flow. Overall, this will help the water environment adapt to the adverse impacts of climate change.

A number of objectives including the ‘Preparation and response’, ‘New and existing buildings’, ‘Culture and historic environment’, ‘Accessing public services’, ‘Water, Sewerage and drainage’, ‘Increasing business awareness of climate risks’ and ‘Farming, fishing and forestry’ objectives support flood resilience including flood management measures such as sustainable urban drainage systems. The ‘Transport system’ objective supports the resilience of the transport network within Scotland to flooding events. ‘A global hub for adaptation research’ objective aims to address loss and damage and supports adaptation to an increased risk of flooding and water scarcity. Overall, this will reduce flood risk and support the adaptation of the water environment to climate change.

Objectives and actions that result in positive effects on the water environment could have secondary benefits on biodiversity, flora and fauna and population and human health. Improving water quality and managing water levels will help maintain ecosystems and marine, coastal and freshwater habitats. In addition, better managing water levels will support resilience of communities during droughts and flooding events and have a positive effect on water security. Overall, minor positive cumulative effects are identified for water.

Air

Many of the outcomes and subsequent objectives and actions within the draft SNAP3 are likely to have benefits for air quality in Scotland.

Objectives and their subsequent actions that promote climate mitigation and a transition to net zero will have a positive effect on reducing greenhouse gas emissions. This will have a positive effect on air quality. In particular, the ‘Place Based Collaboration’ objective supports climate mitigation. In addition, building the resilience of buildings and properties could support improvements in air quality by reducing fossil fuel consumption and improving the energy efficiency

of these buildings. This is supported by the ‘Culture and Historic Environment’, ‘Accessing Public Services’ and ‘A global hub for adaptation research’ objectives. Actions through the ‘Transport System’ objective support the decarbonisation of transport and investment in renewable energy production which could have a positive effect on improving air quality.

The ‘Preparation and Response’ objective supports better training and management in relation to wildfires. This will help in preventing wildfires and reducing the spread of wildfires when they do occur. Overall, this will have a positive effect on reducing the release of greenhouse gas emissions as a result of these wildfires resulting in a positive effect on air quality.

A number of actions within the objectives support increasing green infrastructure and habitat restoration which could include additional tree cover and vegetation. This will have a positive effect on air quality by filtering air pollutants. This is particularly notable through all the objectives under Outcome 1: Nature Connects and the Farming, Fishing and Forestry and Adaptation Innovation objective under Outcome 4: Economy, Business and Industry.

Overall, minor positive cumulative effects are identified for air quality with notable benefits to air found within the objectives under Outcome 1: Nature Connects and Outcome 5: International Action.

Soil

Many of the outcomes and subsequent objectives and actions within the Scottish National Adaptation Plan are likely to have benefits for Scotland’s soils.

Positive effects may arise from objectives and actions which support positive management of soils through reduced soil erosion and enhancements to and creation of green infrastructure and nature networks. In addition, objectives which support woodland and peatland restoration and the creation of nature networks could improve soil quality. This will aid in creating healthy soils which

have higher levels of nutrients, higher rates of water absorption and improved soil fertility. This is included through the objectives under Outcome 1: Nature Connects.

Objectives and actions that support climate change mitigation and adaptation could result in secondary benefits to the soil environment through enhancing soil quality and absorption rates. This is expected through the objectives under Outcome 2: Communities. In addition, the 'Preparation and response' objective aims to reduce harm to soils from extreme weather events such as flooding and wildfires. In particular, the impact of wildfires on soils can decrease soil nutrient levels, and release soil carbon.

Improvements in soils may have related positive effects for water and climate change adaptation by reducing surface water flooding. In particular, from the objectives within Outcome 4: Economy, Business and Industry which support the resilience of the economy and businesses in relation to the adverse impacts of climate change. Therefore, there is a positive synergy between the objectives under Outcome 1: Nature Connects which support enhancements to soils and objectives under Outcome 4: Economy, Business and Industry which support the resilience of businesses and economies against extreme weather events.

Overall, minor positive cumulative effects are identified for soil with notable benefits to soil found within the objectives under Outcome 1: Nature Connects.

Landscape and geodiversity

Many of the outcomes and subsequent objectives and actions within SNAP3 are likely to have benefits for landscape within Scotland.

Objectives and actions aiming to increase and enhance green and blue infrastructure are expected to have a positive effect on landscape and landscape character. This could include the creation of woodland/ tree planting, riparian planting, and enhancement of coastal habitats and peatlands. A

number of objectives under Outcome 1: Nature Connects support enhancements to and the creation of green infrastructure. In addition, the 'Marine ecosystems and the blue environment' objective supports the protection of Scotland's coastal landforms and reducing coastal erosion. This will have a positive effect on Scotland's coastal landscape.

A number of objectives support climate change adaptation and resilience of Scotland's landscape. This will have mixed effects on protecting the character and quality of Scotland's landscapes, through bringing about landscape change. In particular, the 'Preparation and response' objective contains actions which aim to reduce the number of wildfires and flooding events which may result in both changes to the built environment and also changes in vegetation planting and management.

There is the potential for secondary benefits from objectives and actions which support improvements to soil quality including the restoration of peatland soils. This will have subsequent benefits for landscape as peatlands are an integral part of the Scottish landscape.

Overall, minor positive cumulative effects are identified for landscape and geodiversity with notable benefits to landscape found within the objectives under Outcome 1: Nature Connects and Outcome 2: Communities.

Cultural heritage and historic environment

Several of the outcomes and their subsequent objectives and actions within SNAP3 are likely to have minor positive effects for cultural heritage and the historic environment in Scotland. The 'Culture and historic environment' objective will result in significant positive effect. However, some mixed effects (minor positive and minor negative) may arise through objectives within Outcome 1: Nature Connects, Outcome Two: Communities and Outcome 4: Economy, Business and Industry.

The Development Planning, Nature Networks, Natural carbon stores and sinks objective and the Farming, fishing and forestry objectives propose enhancements to blue/green infrastructure which could enhance the setting of a historical asset if well designed. These objectives could also have an adverse impact on known and unknown archaeological features.

A number of objectives support climate change adaptation and resilience of buildings, including those of historic and cultural significance, to extreme weather events such as flooding. This will have a positive impact on protecting the historic environment by reducing loss of and damage to historical assets from climate change. In addition, the ‘Place based collaboration’ and ‘Culture and historic environment’ objective will ensure that the impacts on the historic environment are considered during the creation of proposals and promote collaboration. Conversely, the adaptation of new and existing buildings to the adverse effects of climate change could impact on the quality and setting of historic assets.

However, objectives such as Nature-based solutions and Marine ecosystems and the blue economy, could potentially have negative effects on historical assets by supporting coastal change and new economic activities. In particular, promoting naturally functioning coastal landforms, could lead to the potential for heritage assets near the coast to be lost to erosion. Overall, cumulative minor positive effects are identified for cultural heritage and the historic environment.

Material assets

Several of the outcomes and their subsequent objectives and actions within SNAP3 are likely to have minor positive effects for material assets within Scotland. Significant positive effects are likely to arise within Outcome Two: Communities and Outcome 3: Public Services.

A large number of the objectives and subsequent actions aim to protect material assets from the adverse effects of climate change such as extreme weather. In addition, some of the objectives and actions also support enhancements to

buildings and business sectors to ensure their resilience against the adverse effects of climate change. Overall, this will reduce the potential for damage to infrastructure from climate change and support the creation of resilient places. In particular, the ‘Preparation and response’ objective under Outcome 2: Communities supports the resilience and protection of material assets such as buildings from the effects of climate change. This is supported by the ‘New and existing buildings’ and ‘Culture and historic environment’ objectives which aim to create new and retrofit existing buildings to make them resilient to the effects of climate change reducing the potential for damage to these buildings. The objectives and actions within Outcome 3: Public Services specifically deals with creating resilient essential infrastructure such as healthcare, transport and energy to climate change, ensuring there is minimal disruption to these services. Finally, the objectives and actions under Outcome 5: International Action consider the impact of loss and damage and better ways of dealing the impacts of climate change and how to make economies and communities more resilient to climate change.

In addition, a number of objectives and the subsequent actions support enhancements to and the inclusion of new green and blue infrastructure which could provide a wide range of benefits including flood resistance, ecosystem services and improving soil and water quality. This is mainly through the objectives and actions within Outcome 1: Nature Connects (NC).

Overall, minor positive cumulative effects are identified for material assets with notable benefits found across all the outcomes.

Population and human health

Several of the outcomes and their subsequent objectives and actions within SNAP3 are likely to have minor positive effects for population and human health. Significant positive effects are likely to arise within Outcome Two: Communities.

A number of objectives and actions under Outcome 1: Nature Connects support enhancements to and the creation of new green infrastructure. The ‘Place Based Collaboration’ objective under Outcome 2: Communities also provides protection for greenspaces which could include allotments and community gardens. This could have a positive effect on physical and mental wellbeing including quality of life by offering improved areas for recreation and exercise. In addition, providing tree cover along with green spaces offers areas for cooling and will improve air quality through carbon sequestration. This is particularly important as temperatures are expected to increase as a result of climate change. This is further supported by the ‘Preparation and response’ objective which aims to support and create resilient communities against all types of extreme weather. The ‘A global hub for adaptation research’ objective provides a number of secondary benefits to population and human health and links in with a number of the other objectives and actions under Outcomes 2-4. This is because the objective supports the sharing of knowledge at an international level which could help Scotland better adapt to climate change and consider new methods of doing so. This could bring further positive benefits to the population of Scotland if new methods are considered when creating resilient businesses, economies and infrastructure that support key services and livelihoods.

The health of the population of Scotland is further considered within the objectives and actions under Outcome 3: Public Services. The objectives and actions specifically deal with creating resilient essential infrastructure such as healthcare, transport and energy to climate change ensuring there is minimal disruption to these services. This will ensure that people and communities have access to essential services having a positive impact on health. Specifically, the ‘Power Assets and the energy system’ objective deals with ensuring energy security with benefits for households. This will have positive impacts on the general population as well as those who are vulnerable.

The objectives and actions under Outcome 4: Economy, business and industry support creating resilient businesses and economies. This will have a positive impact on maintaining livelihoods and job security. In particular, the ‘Farming, fishing and forestry’ objective supports resilience within these specific sectors ensuring food security as well as job security.

Overall, minor positive cumulative effects are identified for material assets with notable benefits found across all the outcomes.

Cross cutting policy proposals

In addition to the cumulative, secondary and synergistic effects identified from the outcomes and objectives of the draft SNAP3, there are also strong interlinkages with cross cutting policy proposals. This includes existing and forthcoming national plans and strategies which support climate change mitigation, bring positive effects for biodiversity, flora and fauna, water, material assets and support the delivery of positive effects for population and human health.

What measures could be put in place to avoid, reduce or manage the environmental effects of the Draft Scottish National Adaptation Plan?

2005 Act states that ‘the measures envisaged to prevent, reduce and as fully as possible offset any significant adverse effects on the environment of implementing the plan or programme’ are outlined within the Environmental Report. These measures are often referred to as mitigation measures. The following text summarises the mitigation measures identified from the assessment.

No significant negative environmental effects have been identified, however a range of enhancement measures have been identified in relation to the objectives of Nature based solutions (NC1), Development planning (NC2), Marine Ecosystems and the Blue Economy (NC4), Preparation and Response

(C3), New and existing Buildings (C4), Farming, Fishing and Forestry (B2) and International advocacy (IA2). Identified mitigation includes:

- Ensuring nature based solutions also consider impacts on the historic environment
- Ensuring all information requirements for local development plans are supported
- Ensuring consideration of the impacts of drought on vulnerable rural and island communities
- Ensuring biodiversity and historic environment considerations in the design standards for new buildings
- Ensuring future tree planting avoids adverse impacts on landscape, the historic environment and cultural heritage resources.
- Ensuring consideration of the range of COP activities which will also contribute to managing climate change impacts, such as the COP for biodiversity.

What monitoring is proposed?

Monitoring significant environmental effects is a statutory requirement within the 2005 Act. Monitoring seeks to ensure that plans avoid generating unforeseen adverse environmental effects and enables the responsible authority to undertake appropriate remedial action.

SNAP3 sets out the proposed approach to the Adaptation Monitoring Framework. This includes annual reports to the Scottish Parliament which will include an agreed set of quantitative indicators to monitor the Adaptation Plan’s objectives. To track Scotland's longer-term adaptation outcomes, the Scottish Government plan to publish a baseline at the start and again at the end of the Adaptation Plan’s 5-year period to track trends in resilience.

The proposed approach to monitoring offers key opportunities to incorporate the monitoring of unforeseen environmental effects which should be reflected in the developing detail of the SNAP3 monitoring.

How can I comment on this Environmental Report?

Consultation responses to the Environmental report can be submitted via email to: AdaptationConsultation@gov.scot or by post to:

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Chapter 1

Introduction

Purpose of this Report

1.1 In 2019, the First Minister declared a Climate Emergency in Scotland in recognition of the urgent action required to reduce or halt climate change and potentially irreversible environmental damage resulting from it. The most recent UK Climate Change Risk Assessment identifies the following key climate change risks affecting Scotland **[See reference** 28**]**:

- Impacts on the natural environment, including terrestrial, freshwater, coastal and marine species, forests and agriculture.
- An increase in the range, quantities and consequences of pests, pathogens and invasive species, negatively affecting terrestrial, freshwater and marine priority habitats species, forestry and agriculture.
- Increasing severity and frequency of flooding of homes, communities and businesses.
- More frequent flooding and coastal erosion, causing damage to infrastructure services, including energy, transport, water and Information and Communication Technologies (ICT).
- More extreme temperatures, high winds and lightning on the transport network.
- Increasing high temperatures, affecting people's health and wellbeing and changes in household energy demand due to seasonal temperature changes.
- Damage to cultural heritage assets as a result of temperature, precipitation, groundwater and landscape changes.

1.2 Climate change policy in Scotland responds to both a UK and Scottish framework. There are two key pieces of legislation: the UK Climate Change Act 2008 **[See reference** 29**]** and the Climate Change (Scotland) Act 2009 **[See reference** 30**]**. The UK Act requires a Climate Change Risk Assessment (CCRA) every five years. It is the basis for adaptation policy in both Scotland and the UK.

1.3 Section 53 of the Climate Change (Scotland) Act 2009 requires the preparation of strategic plans for climate change adaptation. These reports are required to be prepared as soon as reasonably practicable after the publication of each CCRA.

1.4 The most recent CCRA was published in 2022 **[See reference** 31**]** and assessed 61 risks and opportunities from climate change in Scotland, including to business, infrastructure, housing, the natural environment, health and risks from the impacts of climate change internationally. The publication of the statutory CCRA triggered the duty on Scottish Ministers under the Climate Change (Scotland) Act 2009 to begin the process of developing the next climate change adaptation plan. The Scottish National Adaptation Plan will therefore address the risks set out in the third CCRA.

1.5 The first Scottish Climate Change Adaptation Programme was released in May 2014, followed by Climate Ready Scotland: Second Scottish Climate Change Adaptation Programme 2019-2024 which was published in September 2019 **[See reference** 32**]**. The draft SNAP3 will replace the current adaptation programme for the period 2019-2024.

Draft Scottish National Adaptation Plan (2024 – 2029)

1.6 SNAP3 is structured around five main outcomes and 22 objectives. The five outcomes set out the case for adaptation action for:

1. Nature Connects: Nature connects across our lands, settlements, coasts and seas

2. Communities: Communities creating climate-resilient, healthy and equitable places.

3. Public Services and Infrastructure: Public services are collaborating in effective, inclusive adaptation action.

4. Economy, Business and Industry: Economies and industries are adapting and realising opportunities in Scotland's Just Transition.

5. International Action: Scotland's international role supports climate justice and enhanced global action on climate adaptation.

1.7 Each outcome has its own set of objects which define how Scottish Government will measure delivery of adaptation actions. They provide the structure around which the Adaptation Monitoring Framework is being built. The objectives are supported by a series of proposed policies. In addition SNAP3 reflects need to actions that cut across all five outcomes including:

- Ensure the Adaptation Plan reinforces other key policy areas, like the Climate Change Plan
- Effective partnership and collaboration with delivery partners
- Development of a climate-smart workforce and skills
- Scaled-up private investment.

Strategic Environmental Assessment

1.8 The Environmental Assessment (Scotland) Act 2005 ('the 2005 Act') **[See reference** 33**]**, is a means to judge the likely impact of the plan, programme or strategy on the environment and to seek ways to minimise adverse effects, if

likely to be significant. The Scottish Government, which is preparing SNAP3, is the 'Responsible Authority' with a duty to undertake the SEA.

1.9 The SEA process comprises a number of stages:

- Pre-screening.
- Screening (preparation of a Screening Report).
- Scoping (preparation of a Scoping Report).
- Environmental Assessment (preparation of an Environmental Report).
- Main consultation on the Environmental Report and Draft SNAP3.
- Preparation of a Post-adoption SEA Statement.
- Monitoring the significant environmental effects of implementing SNAP3.

1.10 A Scoping Report was prepared in December 2023. It was published for five-week consultation with the three statutory bodies, SEPA, HES and NatureScot, from December 2023. The comments received and how these have been addressed are presented in **Appendix B**.

The UK withdrawal from the European Union (Continuity) (Scotland) Act 2021 **[See reference** 34**]**

1.11 Section 15 of the Continuity Act places a duty on responsible authorities to have due regard to the guiding principles on the environment when preparing a plan, programme or strategy requiring a SEA under the Environmental Assessment (Scotland) Act 2005. Whilst not yet in force, nonetheless the guiding principles are set out below and will be taken into account in the preparation of the Environmental Report: The guiding principles as set out in Section 13 (1) of the Act are:

- the principle that protecting the environment should be integrated into the making of policies,

- the precautionary principle as it relates to the environment,
- the principle that preventative action should be taken to avert environmental damage,
- the principle that environmental damage should as a priority be rectified at source,
- the principle that the polluter should pay.

1.12 The SNAP falls with section 5 (3) of the Environmental Assessment (Scotland) Act 2005 requiring an SEA to be undertaken.

Structure of the Environmental Report

1.13 This chapter has described the contents and main objectives of the Draft SNAP and the requirement to undertake SEA. The remainder of this report is structured into the following sections:

- **Chapter 2** describes the approach to assessment including the **difficulties encountered** and consideration of **reasonable alternatives**.
- **Chapter 3** describes the **review of plans, programmes and strategies (PPS) and environmental protection objectives of relevance to the Draft SNAP** (this is supported by more detailed information in **Appendix A: Plans, programmes and strategies**).
- **Chapter 4** presents the **baseline information including key trends and environmental problems** which informs the assessment of the Draft SNAP.
- **Chapter 5** describes the **significant environmental effects** expected from the Draft SNAP.
- **Chapter 6** describes the **mitigation and enhancement** measures proposed.
- **Chapter 7** describes the approach to **monitoring**.

- **Chapter 8** sets out conclusions and the next steps for the Draft SNAP and the environmental assessment process.

1.14 The main body of the report is supported by appendices:

- **Appendix A** presents the review of plans, programmes and environmental protection objectives of relevance to the Draft SNAP.
- **Appendix B** presents the consultation comments received in relation to the SEA Scoping Report, and how these comments have been addressed in this Environmental Report.
- **Appendix C** presents the SEA matrices.
- **Appendix D** provides an overview of the SEA scores.

Chapter 2

Approach to the Assessment

Requirement under the 2005 Act

2.1 The Draft SNAP is considered to fall under Section 5(3) of the 2005 Act. Schedule 3(6) of the 2005 Act requires the Environmental Report to consider – "The likely significant effects on the environment, including (a) on issues such as – (i) biodiversity; (ii) population; (iii) human health; (iv) fauna; (v) flora; (vi) soil; (vii) water; (viii) air; (ix) climatic factors; (x) material assets; (xi) cultural heritage including architectural and archaeological heritage; (xii) landscape; and (xiii) the inter-relationship between the issues referred to in heads (i)–(xii); (b) short, medium and long-term effects; (c) permanent and temporary effects; (d) positive and negative effects; and secondary, cumulative and synergistic effects".

Scoping of SEA Topics

2.2 In accordance with Schedule 2 of the 2005 Act, consideration has been given as to whether the environmental effects (both positive and negative) of the Draft SNAP are likely to be significant.

2.3 Given the high level of some of the proposed measures in the Draft SNAP, all SEA topics required to be considered by the 2005 Act are scoped into the SEA process. These are set out in Table 2.1.

Table 2.1: Scoping in/out of SEA Topics

SEA Topic	Scoped in
Biodiversity, flora and fauna	✓
Population and human health	✓
Soil	✓
Water	✓
Air	✓
Climatic factors	✓
Cultural heritage and the historic environment	✓
Landscape and visual impacts	✓
Material assets	✓

Approach to assessment

2.4 The actions identified under each Outcome of SNAP3 are assessed against the SEA objectives set out below (see Table 2.3). Recommendations for changes to the SNAP and potential mitigation measures will be set out for the actions.

2.5 Schedule 2 of the 2005 Act identifies criteria for determining the likely significance of effects on the environment (see Table 2.2) which will be reflected in the approach to scoring.

Criteria for assessing likely significant effects

SEA Assessment Criteria

a) the probability, duration, frequency and reversibility of the effects

Breakdown and Description

- Probability
  - Low – Not likely to have an effect
  - Medium – as likely to have an effect as not
  - High – Highly likely to have an effect
- Duration
  - Short-term – 0-1 years
  - Medium-term – 1-2 years (up to the end of strategy period)
  - Long-term – 2+ years (beyond the end of the strategy period)
- Frequency
  - Continual; defined by number of occurrences; or intermittent
- Reversibility
  - Whether the effect can be reversed (i.e. can the receptor return to baseline condition) without significant intervention

b) the cumulative nature of the effects

Breakdown and Description

- Where several options each have insignificant effects but together have a significant or combined effect. This includes synergistic effects, which occur when effects interact to produce a total effect greater than the sum of the individual effects.

c) the transboundary nature of the effects

Breakdown and Description

- Effects beyond Scotland's boundary.

d) the risks to human health or the environment

Breakdown and Description

- Whether the impact of the effect would present a risk for people and the environment.

e) the magnitude and spatial extent of the effects (geographical area and size of the population likely to be affected)

Breakdown and Description

- Magnitude

  - High – High proportion of the receptor affected
  - Medium
  - Low – Low proportion of the receptor affected
- Spatial extent
  - National/Transboundary – Effects on Scotland or England
  - International – Effects extending to the UK or beyond

f) the value and vulnerability of the area likely to be affected due to:

- i) special natural characteristics or cultural heritage
- ii) exceeded environmental quality standards or limit values
- iii) intensive land-use

Breakdown and Description

- Impact of the effect on the value or condition of the existing area.

g) the effects on areas or landscapes which have a recognised national, Community or international protection status

Breakdown and Description

- Impacts on areas with national, or international protection.

SEA Framework

2.6 The development of a set of SEA objectives (known as the SEA Framework) is a recognised way in which the likely environmental and sustainability effects of a plan, programme or strategy can be described, analysed and compared. The framework consists of a list of 'sustainability objectives' referred to in the report as the SEA objectives. These derive from the review of plans, programmes and strategies (PPS) and an analysis of baseline information and key environmental issues.

2.7 The environmental protection objectives and appraisal guidance (which provide a guide to the factors that should be considered when carrying out assessments) set out in the SEA Framework are subject to change as new information comes to light during the SEA process.

2.8 The SEA Framework is set out overleaf; each primary bullet point constitutes an environmental protection objective and the sub-bullet points set out further guidance to help guide the appraisal of each objective. The SEA Framework is structured to encompass each SEA topic, however, some topics are covered in more than one SEA objective. **Table 2.3** details each SEA topic and the corresponding SEA objective(s).

Table 2.2: SEA topic and corresponding SEA objective(s)

SEA topic	SEA objective
Biodiversity, flora and fauna	1: Biodiversity, flora and fauna 2: Population and human health
Population and human health	2: Population and human health 3: Air quality and climate change mitigation 4: Flood risk and climate change adaptation 5: Soil 6: Water

SEA topic	SEA objective
Climatic factors	3: Air quality and climate change mitigation 4: Flood risk and climate change adaptation
Air	3: Air quality and climate change mitigation
Soil	5: Soil
Water	6: Water
Cultural heritage, including architectural and archaeological heritage	7: Cultural heritage, including architectural and archaeological heritage
Landscape	8: Landscape
Material assets	9: Material assets 2: Population and human health

1. Biodiversity, flora and fauna

- **1: Biodiversity, flora and fauna:** Protect, maintain, and where possible, enhance designated sites, habitats and protected species.
  - Does the draft SNAP3 protect and enhance designated and undesignated ecological assets, including promoting habitat connectivity; avoiding fragmentation; and adverse impacts on habitats and species from climate adaptation-related changes to air quality, water quality and quantity?
  - Does the draft SNAP3 support the restoration of habitats, including marine and coastal habitats?
  - Does the draft SNAP3 support measures to prevent and control invasive non-native species?
  - Does the draft SNAP3 maintain and enhance a ‘Nature Network’ of ecological assets and blue and green infrastructure, taking into account the impacts of climate change?

2. Population and human health

- **2: Population and human health:** Improve the health and wellbeing of the people of Scotland:
  - Does the draft SNAP3 avoid adverse effects on health, health inequalities and quality of life/well-being?
  - Does the draft SNAP3 improve the resilience of communities, particularly those most vulnerable to climate change?
  - Does the draft SNAP3 encourage the creation, management and enhancement of a coherent green and blue infrastructure (GBI) network?
  - Does the draft SNAP3 increase the resilience of essential services such as healthcare, education, and social care?
  - Does the draft SNAP3 protect and improve human health and wellbeing by improving the quality of the living environment of people and communities?

3. Climate change mitigation

- **3. Climate change mitigation**: Minimise greenhouse gas emissions from natural and man-made sources.
  - Does the draft SNAP3 reduce emissions from natural sources?
  - Does the draft SNAP3 reduce emissions from man-made sources?
  - Does the draft SNAP3 support the protection of low carbon and renewable energy generating and transmission sources?

4. Air

- **4: Air:** Improve Scotland’s air quality and by reducing concentrations of harmful atmospheric pollutants and avoiding their emission.

- Does the draft SNAP3 improve air quality through reduced reliance on and combustion of fossil fuels?
- Does the draft SNAP3 reduce emissions of harmful atmospheric emissions from all sources?

5. Soil

- **5: Soil:** Conserve and enhance Scotland's soil resources and geological sites:
  - Does the draft SNAP3 safeguard and improve soil quality and quantity?
  - Does the draft SNAP3 protect, conserve and restore carbon rich soils?
  - Does the draft SNAP3 conserve designated and undesignated geological assets?
  - Does the draft SNAP3 reduce the extent of contaminated and vacant and derelict land?

6. Water

- **6: Water:** Preserve and enhance the quality and quantity of waterbodies and groundwater and reduce the risk and effects of flooding, both now and in the future.
  - Does the draft SNAP3 maintain or improve the quality and quantity of watercourses, surface water (including coastal waters) and groundwater waterbodies?
  - Does the draft SNAP3 direct new development away from areas at highest risk of flooding and avoid inappropriate development in areas at risk of flooding, taking into account the effects of climate change and mitigate residual risks without increasing flood risk elsewhere?
  - Does the draft SNAP3 increase the resilience of transport systems, infrastructure and public services to the effects of climate change, via flood resilient design?

- Does the draft SNAP3 promote the use of SuDS, where appropriate?
- Does the draft SNAP3 encourage the creation, management and enhancement of a coherent green and blue infrastructure (GBI) network to manage surface water and drainage?

7. Cultural heritage including architectural and archaeological heritage

- **7: Cultural heritage including architectural and archaeological heritage**: Conserve and enhance the character and built quality of settlements and Scotland's historic environment and cultural heritage:
  - Does the draft SNAP3 protect, conserve and enhance designated and undesignated heritage assets and their settings?
  - Does the draft SNAP3 improve the resilience of the historic environment from the adverse effects of climate change?

8. Landscape, seascape and townscape

- **8: Landscape, seascape and townscape**: Conserve and enhance the character and quality of Scotland's landscapes / townscapes / seascapes.
  - Does the draft SNAP3 protect and enhance the character and quality of Scotland's landscapes, townscapes and seascapes, particularly in designated or sensitive landscapes, from the adverse effects of climate change?
  - Does the draft SNAP3 encourage the retention and planting of green infrastructure to protect landscape character?

9. Material assets

- **9: Material assets:** Use natural resources and energy more efficiently.

- Does the draft SNAP3 encourage the prudent use of natural resources, particularly scarce resources?
- Does the draft SNAP3 protect existing infrastructure?

Use of the SEA Framework

2.9 The findings from the SEA of the Draft SNAP are presented in SEA matrices corresponding to the SEA topic areas. The matrices use a colour coded symbol showing the score for each action and target against each of the SEA objectives and include a concise justification for the score given. The SEA matrices are presented in **Appendix C**.

2.10 The use of colour coding in the matrices allows for likely significant effects (both positive and negative) to be easily identified, as shown in Table 2.4 below.

Table 2.3: SEA Framework Symbol and Colour Coding

Symbol and Colour Code	Description
++	Significant positive effect likely
++/-	Mixed significant positive and minor negative effects likely
+	Minor positive effect likely
++/--	Mixed significant positive and significant negative effects likely
+/-	Mixed minor positive and minor negative effects likely
-	Minor negative effect likely
--/+	Mixed significant negative and minor positive effects likely
--	Significant negative effect likely

Symbol and Colour Code	Description
0	Negligible effect likely
?	Uncertain effect
N/A	Not applicable or relevant

2.11 Where a potential positive or negative effect is uncertain, a question mark has been added to the relevant score (e.g. +? Or -?) and the score colour coded as per the potential positive, negligible or negative effect.

2.12 Scoring is relative to the scale of proposals under consideration and is determined by the significance of the effect. In order to determine significance, it is important to identify and differentiate between the levels of impact and to consider the following factors:

- The magnitude of the SNAP's effects, including the degree to which it sets a framework for projects, the degree to which it influences other plans and environmental problems relevant to the SNAP.
- The sensitivity of the receiving environment, including the value and vulnerability of the area, exceeded environmental quality standards, and effects on designated areas or landscapes.
- The nature of the environmental effect, including aspects such as probability, duration, frequency, reversibility, cumulative effects, transboundary effects, risks to human health or the environment, and its magnitude and spatial extent.

2.13 The likely effects of the actions scoped into the assessment need to be determined and their significance assessed, which inevitably requires a series of judgments to be made. The dividing line in making a decision about the significance of an effect is often quite small. Where either (++) or (--) is used to distinguish significant effects from more minor effects (+ or -) this will be because the effect on the SEA objective in question is considered to be of such

magnitude that it will have a noticeable and measurable effect taking into account other factors that may influence the achievement of that objective.

Consideration of Reasonable Alternatives

2.14 Part 14(2) of the 2005 Act requires that:

The report shall identify, describe and evaluate the likely significant effects on the environment of implementing (a) the plan or programme; and (b) reasonable alternatives to the plan or programme, taking into account the objectives and the geographical scope of the Plan or Programme.

2.15 Therefore, the SEA must appraise not only the objectives and actions, but reasonable alternatives to these. This implies that alternatives that are not reasonable do not need to be subject to appraisal. It is important to note that when considering the scope of alternatives the 2005 Act does not specify whether this means considering an alternative plan, programme, or strategy, or different alternatives within the plan, programme, or strategy itself that should be assessed. Part (b) of Regulation 14(2) above notes that reasonable alternatives will take into account the objectives of the plan, as well as its geographical scope. Therefore, alternatives that do not meet the objectives of national policy are unlikely to be reasonable.

2.16 Consideration of alternatives was undertaken in discussion with the Consultation Authorities. The extent to which alternatives for the third Scottish National Adaptation Plan (SNAP3) could be considered ‘reasonable’ was influenced by the following factors: the legislative framework for the document; the significant proportion of committed policy and action embodied in the document; the share of policies and proposals focussed on improving the evidence base to inform future adaptation; and the uncertainty associated with some of the climate change impacts.

2.17 The following alternative option to SNAP3 was proposed by the Scottish Government after discussion with key stakeholders:

- **Additional private investment funding:** The proposed plan is based on a combination of action from the public and private sector. There is a reasonable option where SNAP3 could outline specific expectations for additional action to be funded by the private sector over and above that envisaged in the proposed plan and/or adaptation action to be funded to a greater extent by private sources than is envisaged by the proposed plan. This approach is not preferred as it would depend on additional private sector investment which is outwith the control of Scottish Ministers creating a delivery risk, and is also subject to the current economic pressures on many businesses already during the post-Covid recovery period.

2.18 The Climate Change Committee recommended an outcome-based approach is used in SNAP3 which illustrates what the programme aims to accomplish. Believed benefits of this approach include allowing focus for activity, promoting collaboration across sectors and agencies, providing strong opportunities to communicate how programmes are doing (increasing transparency and accountability), and encouraging long term thinking. An outcomes-based approach also allows for alignment with the Scottish Government's National Performance Framework and supports monitoring and evaluation in a more holistic way. However other approaches were considered early in the process prior to, during and after policy development. The following two alternative approaches are proposed as reasonable alternatives however were not the preferred approach given their limitations weighed against the benefits of the outcome-based approach:

- **Taking a hazard-based approach:** This type of approach would strategically target the increased hazards caused by climate change separately. This approach was explored with the following hazard categorisation: wildfire, storms, high temperatures and heatwaves, low temperatures and snow, coastal flooding, fluvial flooding, surface water flooding, drought and poor air quality. This approach is common in nature-based risk resilience strategies and provides a good opportunity to ensure priority hazards are addressed. However, this approach is not preferred

given the strong likelihood for climate hazards to be cascading or compounding in nature which a single-hazard approach may struggle to adequately address. This also takes focus away from slower onset climate-related risks which may not be categorised by one or more individual events such as higher than average temperatures affecting growing seasons, for example.

- **Taking a sector-based approach:** This type of approach would consider the adaptation needs from the perspective of each particular economic sector in Scotland and meet the needs of sector concerned. While this approach would be useful in capturing the nuances of each sector and align the adaptation agenda more closely with the approach of the Climate Change Plan, this alternative this would not be preferred as it is considered likely to lead to higher costs and lower benefits as it would not provide the opportunity for synergies between sectors and lead to siloed action. Several sectors also largely rely on matters reserved to the UK Parliament making it difficult for the Scottish Government to balance efforts across sectors.

2.19 The following options were identified as alternative options but were not considered as reasonable. The 'do nothing' scenario is a standard option within SEAs; and the Consultation Authorities recommended further exploration of the risk-based approach as an alternative option at Scottish Government's initial meeting with them:

- **'Do nothing' scenario:** This was not identified as a reasonable alternative given the Climate Change (Scotland) Act 2009 requires the preparation of a strategic programme for climate adaptation following the latest UK Climate Change Risk Assessment. The legal consequences of pursuing this option are yet untested and would rely on continuation of the existing programme which was designed to cover the period 2019-2024. As well as being in contravention with statutory requirements, the "do nothing" approach would also have a wide range of social, economic, political and environmental consequences as set out in the UK CCRA and UK Climate Projections 2018.

- **Taking a risk-based approach:** This type of approach would respond to the 61 risks identified in the UK CCRA directly, addressing each one individually. Completely aligning with the identified climate risks and opportunities would theoretically ensure all risks are addressed providing greater environmental benefits. However, as the risks within the UK CCRA are not Scotland-specific, for example, those covering reserved areas such as foreign policy and migration, dependence on a risk-based approach in this way which focuses only on some of the risks was not identified as a reasonable alternative. Furthermore, the crosscutting nature of many policies could potentially risk duplication of resource and failure to take full advantage of co-benefits.

Assessment of environmental effects of alternatives

Additional private investment funding

2.20 This alternative reflects an approach where additional action would be funded by the private sector over and above that envisaged in the proposed plan and/or adaptation action to be funded to a greater extent by private sources than is envisaged by the proposed plan. There is a lack of detail pertaining to the sections of SNAP3 which would have been suitable for additional private sector funding. In light of this lack of detail it is assumed that additional private investment funding would be secured across the five outcomes. The environmental effects of SNAP3 incorporating action to be funded by the private sector over and above that envisaged in the proposed plan would lead to an increase (either positive or negative) in the environmental effects identified from the assessment of the preferred option. The degree to which the environmental effects would be increased would depend upon the scale of additional funding, which is unknown, and highlighted as an uncertainty within the description of this alternative. Therefore, this alternative would potentially deliver greater positive effects and greater negative effects, but with a high degree of uncertainty.

Taking a hazard based approach

2.21 Taking a hazard based approach would rely on an alternative structure to the SNAP3, but would essentially contain the same policy content. Additionally, many of the actions in SNAP3 represent continuation or expansion of existing initiatives or policy. This further reinforces the likelihood that the policy content would be similar in an alternatively structured document. Based on these parameters, it is judged that the environmental effects of a SNAP3 based on a hazard based approach would be the same as those for the preferred option, as outlined in Section 5.

Taking a sector based approach

2.22 The structure of SNAP3 strongly reflects a sector based approach, as each outcome is closely related to different sectors. Therefore the environmental effects of a sector based approach are identified as being the same as for the preferred option, as set out in Chapter 5.

Cumulative, secondary and synergistic effects

2.23 The assessment considers any cumulative, secondary and synergistic effects arising from the SNAP, and these are presented in Chapter 5 of the Environmental Report.

Mitigation and monitoring proposals and opportunities for enhancement

2.24 A key part of the SEA process is the identification of opportunities to mitigate adverse effects and enhance benefits. The process also includes the development of proposals for monitoring post adoption.

2.25 As noted above, initial feedback on mitigation and enhancement measures was provided to allow this to be reflected in the actions as appropriate. This included the recognition of the recommended enhancement, but in some cases acknowledgement that this would be reflected in future work.

2.26 Recommendations for monitoring are covered in Chapter 7.

Difficulties Encountered

2.27 The main difficulties encountered relate to the lack of detail on the scale of adaptation actions which will be achieved. In addition, several of the actions relate to the content of future plans, policies or programmes which are yet to be written. Although the broad content of these documents is known, the level of detail and scale of outcomes to be achieved through these is unknown.

2.28 There are varying levels of detail in relation to some of the actions described, which mean the scale of environmental effects is unclear. Furthermore, the content of SNAP3 refers both to the continuation of current actions, the expansion and enhancement of these. Where actions relate to increased education, knowledge sharing, training and partnership working, the scale of environmental effects achieved through these is challenging to assess.

Chapter 3

Environmental Context

Relationship of Plans, Policies, Programmes and Strategies and Environmental Protection Objectives

Introduction

3.1 The draft SNAP3 is greatly influenced by other plans / programmes and by broader environmental objectives. The draft SNAP3 must conform to environmental protection legislation and the environmental objectives established at international and national levels, as well as contributing to the goals of a wide range of other plans and programmes.

Schedule 3 of the 2005 Act requires:

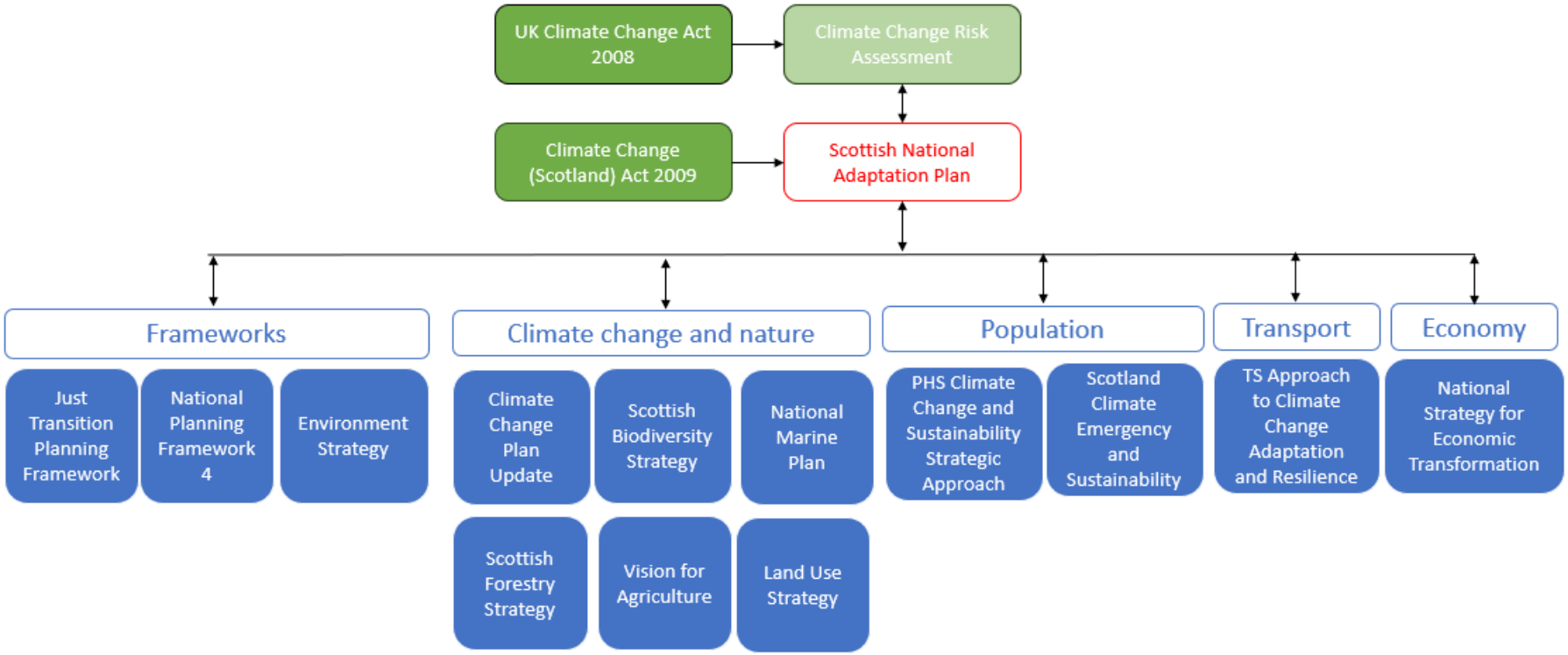
- *"an outline of the contents and main objectives of the plan or programme, and of its relationship (if any) with other qualifying plans and programmes"; and*
- *the environmental protection objectives, established at international or national level, which are relevant to the plan or programme and the way those objectives and any environmental considerations have been taken into account during its preparation".*

3.2 A review of the key national legislation and plans of relevance to the draft SNAP3 is detailed in **Appendix A**. It should be noted that this report has been

prepared to be proportionate to the scale and nature of the proposed changes that may result from the implementation of the plan. It is not intended to be a register of all legislation / plans, but rather an examination of the key environmental protection objectives relevant to the draft SNAP3. A summary of the most relevant plans is provided in the subsequent paragraphs.

Figure 3.1 illustrates the links and inter-relationships between the draft SNAP3 and other key relevant international and national plans.

Figure 3.1: Links between Scottish National Adaptation Plan and other relevant plans



National legislation

3.3 Climate change policy in Scotland responds to both a UK and Scottish framework.

3.4 There are two key pieces of legislation: the **UK Climate Change Act 2008 [See reference** 35**]** and the **Climate Change (Scotland) Act 2009 [See reference** 36**]**. The UK Act requires a Climate Change Risk Assessment (CCRA) every five years. It is the basis for adaptation policy in both Scotland and the UK. Section 53 of the Climate Change (Scotland) Act 2009 requires the preparation of strategic plans for climate change adaptation. These reports are required to be prepared as soon as reasonably practicable after the publication of each CCRA. The most recent CCRA was published in 2022 **[See reference** 37**]** and assessed 61 risks and opportunities from climate change in Scotland. The publication of the statutory CCRA triggered the duty on Scottish Ministers under the Climate Change (Scotland) Act 2009 to begin the process of developing the next climate change adaptation plan. The Scottish National Adaptation Plan will therefore address the risks set out in the third CCRA.

National policy

3.5 Scotland's **National Just Transition Planning Framework [See reference** 38**]** sets out the long-term vision to deliver a fairer, greener future for all by 2045 across all sectors on Scotland's journey to a net zero and climate resilient economy. Identifying key risks from climate change and setting out actions to build resilience to these risks is one of the Scottish Government's fundamental National Just Transition Outcomes. This recognises that a transition to net zero cannot be truly just if those most vulnerable in society are still experiencing the adverse effects of climate change. In particular, the Scottish Government's just transition policy will address a fair distribution of the costs and benefits associated with climate resilience measures. As lower-income households are

more vulnerable to the impacts of climate change, it is imperative to improve these inequalities in addressing both climate resilience and mitigation measures. The Scottish Government is developing individual Just Transition Plans to outline how different sectors (e.g. land use and agriculture, transport, built environment, construction) will reduce greenhouse gas emissions and adapt to climate change and will publish these in draft in 2024 (discussed further below).

3.6 National Planning Framework 4 (NPF4) **[See reference** 39**]** is the national spatial strategy for Scotland. It sets out the spatial principles, regional priorities, national developments and national planning policy for Scotland to 2045. One of the core aims of NPF4 is to support the planning and delivery of 'sustainable places'. Sustainable places will be *"net zero, nature-positive places that are designed to reduce emissions and adapt to the impacts of climate change, whilst protecting, recovering and restoring the environment"* (p.7). Whilst decision-makers are required to consider the development plan (which includes NPF4) as a whole, those policies of most relevance to the topic of climate change adaptation include:

- **Policy 1: Tackling the climate and nature crises**: The policy intent isto encourage, promote and facilitate development that addresses the global climate emergency and nature crisis.
- **Policy 2: Climate mitigation and adaptation:** The policy intent isto encourage, promote and facilitate development that minimises emissions and adapts to the current and future impacts of climate change.
- **Policy 3: Biodiversity:** The policy intent is to protects biodiversity, reverse biodiversity loss, delivers positive effects from development and strengthen nature networks.
- **Policy 4: Natural places:** The policy intent is to protect, restore and enhance natural assets making best use of nature-based solutions.
- **Policy 6: Forestry, woodland and trees:** The policy intent is to protect and expand forests, woodland and trees.

- **Policy 7: Historic assets**: The policy intent is to protect and enhance historic environment assets and places, and to enable positive change as a catalyst for the regeneration of places.
- **Policy 10: Coastal development:** The policy intent isto protect coastal communities and assets and support resilience to the impacts of climate change.
- **Policy 19: Heat and cooling:** The policy intent isto encourage, protect and facilitate development that supports decarbonised solutions to heat and cooling demand and ensure adaptation to more extreme temperatures.
- **Policy 20: Blue green infrastructure:** The policy intent is to protect and enhance blue green infrastructure and their networks to deliver multiple functions including climate mitigation, nature restoration, biodiversity enhancement, flood prevention and water management.
- **Policy 22: Flood risk and water management**: The policy intent is to strengthen resilience to flood risk by promoting avoidance as a first principle and reducing the vulnerability of existing and future development to flooding.

3.7 The **Environment Strategy for Scotland** **[See reference** 40**]** creates an overarching framework for Scotland's existing environmental strategies and plans, including the forthcoming Scottish National Adaptation Plan. The key outcomes of the strategy focus on protecting and restoring nature; reducing greenhouse gas emissions; and ensuring Scotland is resilient to the future impacts of climate change through adaptation measures.

3.8 The draft SNAP3 sits closely alongside Scotland's **Climate Change Plan 2018-2032** for which an update was published in December 2020 **[See reference** 41**]** which sets out the policies and proposals required to drive delivery in Scotland's journey towards net zero emissions by 2045. It sets out a detailed and ambitious package of actions of which adaptation and resilience are key components. Both draft SNAP3 and the updated Climate Change Plan share common nature-based solutions which help to achieve the outcomes desired in both climate change mitigation and adaptation plans.

3.9 One of the biggest opportunities Scotland has to adapt to climate change is through regenerating and restoring nature:

- The **Scottish Biodiversity Strategy to 2045** **[See reference** 42**]** sets out a clear goal to halt biodiversity loss by 2030. By 2045, habitats, ecosystems and species will thrive and adapt to climate change. The strategy supports nature-based solutions to mitigate and adapt to climate change including the protection and enhancement of blue and green infrastructure, peatland and blue carbon habitat restoration, as well as management of invasive non-native species and adapting farming practices. Delivering the goals of the strategy will be supported by a framework for statutory nature restoration targets which will be set out in a new **Natural Environment Bill** (discussed further below).
- **Marine Scotland's Blue Economy Vision for Scotland** **[See reference** 43**]** sets out a similar vision for Scotland's blue economy whereby marine, freshwater and coastal environments are restored, adapted and resilient to climate change by 2045. The vision supports actions which ensure the blue economy is resilient to climate change; contributes to climate mitigation and adaptation; decarbonises marine sectors; and supports Scotland's net zero and nature positive commitments.
- **Scotland's Forestry Strategy 2019-2019** **[See reference** 44**]** supports the adaptation of Scotland's forests and woodlands to become more resilient to climate change e.g. by managing for, and mitigating against, the threats posed by tree pests and diseases; and, supporting forest design to increase the capacity of forests and woodlands to adapt to, and thrive in, a changing climate.
- The Scottish Government's **Vision for Agriculture** **[See reference** 45**]** outlines the long-term vision to transform farming and food production in Scotland which features climate change adaptation and mitigation as a key outcome. A new **Agriculture Bill** aims to provide Scotland with a framework that supports the values and principles contained in the vision (discussed further below).
- Scotland's **Third Land Use Strategy 2021-2026** **[See reference** 46**]** sets out the long-term vision, objectives and policies to achieve sustainable land use. The strategy supports opportunities for nature-based solutions to

mitigate and adapt to climate change whilst restoring nature, e.g. through the development of green and blue infrastructure.

3.10 Climate change directly and indirectly harms health and wellbeing, widening existing inequalities. Climate action is an opportunity to deliver co-benefits for population, health, wellbeing and equity:

- **Public Health Scotland's Climate Change and Sustainability Strategic Approach 2023-2026 [See reference** 47**]** sets out the public health approach to climate change which will enhance preparedness, increase resilience, and protect and promote human and planetary health through aligned actions on climate, population health and equity. Actions to achieve this vision include:
  - Raising awareness of the interconnected issues of climate, population health and equity.
  - Building the evidence base to understand vulnerabilities to, and differential population health and wellbeing effects of, climate impacts in Scotland, and assessing the potential risks and opportunities to population health and equity from climate action.
  - Preparing for and responding to risks to health arising from climate change, such as adverse weather events and emerging climate sensitive infectious diseases.
- **NHS Scotland Climate Emergency and Sustainability Strategy 2022-2026 [See reference** 48**]** sets out plans for NHS Scotland to reduce its greenhouse gas emissions to net zero and adapt its estate to climate change impacts. The strategy supports the development by health boards of Climate Change Risk Assessments and Adaptation Plans.

3.11 Transport Scotland's Approach to Climate Change Adaptation and Resilience [See reference 49**]** sets out an ambitious vision for a well-adapted transport system in Scotland which "*is safe for all users, reliable for everyday journeys and resilient to weather-related disruption".* The approach outlines four strategic outcomes:

- Adapting trunk roads to the current, projected and unexpected impacts of climate change.
- Supporting the delivery of climate change adaptation and resilience for Scotland's rail network.
- Engaging with aviation stakeholders to support their decision making in relation to climate change adaptation and resilience.
- Safeguarding lifeline ferry services, ports, harbours and canals in response to the threat of climate change.

3.12 The **National Strategy for Economic Transformation [See reference 50]** (NSET) sets out the priorities for Scotland's economy, as well as the actions needed to maximise the opportunities over the next decade to achieve the vision of a wellbeing economy. NSET aims to achieve economic resilience and identifies climate adaptation actions to future-proof the productivity of Scotland's economy over the long term, including nature-based solutions to climate change mitigation and adaptation, sustainable farming and forestry, nature restoration and eco-tourism.

3.13 Our Past, Our Future, Scotland's national strategy for the historic environment [See reference 51] sets out a national mission to sustain and enhance the benefits of Scotland's historic environment, for people and communities now and into the future. This strategy targets activity where the historic environment can deliver most benefit for the people of Scotland 2023-2028. Along with outcomes aimed to be achieved, three priority areas for action have been identified:

- Delivering the transition to net zero.
- Empowering resilient and inclusive communities and places.
- Building a wellbeing economy.

Forthcoming legislation and policy

3.14 Scotland is currently undergoing a period of significant policy change, with the following legislation and policies relevant to climate change adaptation forthcoming:

- **Nature Environment Bill:** Proposals for the upcoming Nature Environment Bill include the introduction of binding statutory nature recovery targets.
- **Land Reform Bill**: The upcoming Land Reform Bill proposes to adapt the legal framework around agricultural holding tenancies to allow tenant farmers to undertake a combination of agricultural and non-agricultural activities, which could support climate change mitigation and adaptation through the restoration of habitats.
- **Agriculture and Rural Communities Bill**: This legislation will support farmers and crofters to produce food more sustainably, restore biodiversity and reduce emissions, which is essential in delivering climate change mitigation and adaptation. The Scottish Government plans to use this new framework to deliver its Vision for Agriculture. **Water, wastewater and drainage policy**: The Scottish Government is currently consulting on proposed principles and considerations for the future requirements of the water industry. This is in direct response to the extremes of water experienced in Scotland due to climate change, water scarcity and flooding, and ensuring that our water industry, businesses and individuals are engaged in measures taken to address this.
- **Flood Resilience Strategy**: Scotland's first Flood Resilience Strategy is currently being prepared by the Scottish Government, the Scottish Flood Forum, ClimateXChange and Sniffer. It will form an integral part of shaping a climate resilient Scotland and will outline Scotland's ambitions and principles for delivering flood resilience over the coming decades. The strategy, scheduled for finalisation by the end of 2024, will be followed by delivery plans to translate the ambitions into actions as Scotland prepares for increased exposure to flooding.

- **Climate Change Plan:** The next Climate Change Plan, due in 2025, will seek to further strengthen and reinforce the co-benefits and interdependencies integral to climate change mitigation and adaptation.
- **Just Transition Plans:** The Scottish Government is developing its approach to Just Transition Plans in 2024. The Just Transition Plans will outline how different sectors (e.g. land use and agriculture, transport, built environment, construction) will reduce greenhouse gas emissions and adapt to climate change. The Just Transition Plans will support the delivery of the draft SNAP3 by identifying key physical risks from climate change and the actions required to build resilience to these risks. In turn, these actions will be integrated within draft SNAP3, as appropriate.

Chapter 4

Environmental Baseline

4.1 Schedule 3 of the 2005 Act requires information to be provided on:

- The relevant aspects of the current state of the environment and the likely evolution thereof without implementation of the plan or programme.
- The environmental characteristics of areas likely to be significantly affected.
- Any existing environmental problems which are relevant to the plan or programme including, in particular, those relating to any areas of a particular environmental importance, such as areas designated pursuant to Council Directives 79/409/EEC on the conservation of wild birds and Council Directive 92/43/EEC on the conservation of natural habitats and of wild flora and fauna (as last amended by Council Directive 97/62/EC).

4.2 For each environmental topic, baseline data has been collated to provide an understanding of the environment and key environmental risks and opportunities. The suggested environmental baseline covers the whole of Scotland. Presenting the baseline at national level allows the SEA to reflect on the interaction of the draft SNAP3 with wider environmental trends.

4.3 Current trends and pressures will be explored further for each topic scoped into the assessment, and information will be drawn from a range of sources including the Scottish Government, Nature Scot, Historic Environment Scotland (HES), the Scottish Environment Protection Agency (SEPA), and Scotland's Environment Web, amongst others. The draft SNAP3 will be assessed against this baseline to provide an indication of the type and significance of environmental effects that could arise.

4.4 SEA Guidance recognises that data gaps will exist but suggests that, where baseline information is unavailable or unsatisfactory, authorities should consider

how it will affect their assessments and determine how to improve it for use in the assessment of future plans. Where there are data gaps in the baseline and forthcoming reports, these are highlighted in the text. The collection and analysis of baseline data is regarded as a continual and evolving process, given that information can change or be updated on a regular basis. Relevant baseline information will be updated during the SEA process as and when data is published.

4.5 The topic of 'climatic factors' typically covers both climate change mitigation and adaptation. Due to the focus of SNAP3 on adaptation, this is reflected within each SEA topic.

4.6 The section below identifies relevant national data sources that have been used to inform the environmental baseline.

Environmental data sources

Biodiversity, flora and fauna

Relevant national data sets

- Nature Conservation designations including Special Protected Areas (SPAs), Special Areas of Conservations (SACs), Sites of Special Scientific Interest (SSSI), Ramsar, National Nature Reserves (NNR), Marine Protected Areas (MPA) and Possible MPAs (PMPAs)
- Habitat networks
- Biodiversity trend data
- Woodland areas/types
- Ecosystem health indicators
- The Greenspace Scotland map data set

Population and human health

Relevant national data sets

- Scottish Index of Multiple Deprivation (SIMD)
- Access to blue/greenspace
- Green networks data including Central Scotland Green Network
- Scottish Pollutant Release Inventory

Soil

Relevant national data sets

- Peatland and topsoil organic C content
- Prime Agricultural Land / Land Capability for Agriculture in Scotland

Water

Relevant national data sets

- Water Quality Classification – groundwater bodies
- Water Quality Classification – coastal
- Areas of flood risk – rivers, surface water and coastal
- Flood maps and Flood Risk Management Strategies - information on the causes and consequences of flooding
- Drinking water quality

- The Greenspace Scotland Map - identifies accessible recreational and leisure greenspace and is an important resource in considering the potential to improve and further enhance blue-green infrastructure with the multiple benefits this has in terms of place-making

Air

Relevant national data sets

- Air Quality Management Areas (AQMAs)
- Scottish Pollutant Release Inventory

Climatic Factors

Relevant national data sets

- Scottish Pollutant Release Inventory
- Scottish Transport Statistics

Cultural Heritage

Relevant national data sets

- Listed buildings, Historic Battlefields, Scheduled Monuments, Conservation Areas, Gardens and Designed Landscapes, World Heritage Sites, Historic Marine Protected Areas
- Undesignated historic environment assets from Canmore

Landscape and Geodiversity

Relevant national data sets

- Wild Land Areas identified on the SNH 2014 Map
- Dark Skies Park, Geoparks, National Scenic Areas, Biosphere Reserve, National Parks, Geological Conservation Review Sites.

Material Assets

Relevant national data sets

- Transport and waste infrastructure: Railway stations, airports, ports and harbours, incinerators, national cycle routes, national walking and cycling network, Scotland's Great Trails, landfill sites, railways, ferry routes, trunk roads, materials recovery facilities/recycling plants. Energy infrastructure (generation and transmission).
- Waste Discover Data tools (licenced / permitted waste facilities)
- National heat map (demand and supply)
- Scottish Water Strategic Asset Capacity and Development Plan
- Vacant and Derelict Land data

Biodiversity, flora and fauna

Overview of baseline

4.7 Scotland's rich, varied landscapes and habitats have been shaped by underlying rocks, soils and landforms, our seas and the Scottish weather. Scotland is renowned for its number of species and its complex mosaic of habitats. It is home to internationally important habitats including for example, more than 30,000 freshwater lochs and blanket bog, which covers 23% of our land area.

4.8 Biodiversity is commonly used as a measure of the health of an ecosystem and helps to provide the ecosystems services that are the basis of life including the regulation of air and water, soil formation, nutrient cycling, flood regulation and pollination, amongst many others **[See reference** 52**]**. Biodiversity, flora, and fauna is also closely linked with other environmental topics, particularly soil and water, which help to support an incredible diversity of life across Scotland and in its surrounding waters.

4.9 As of 2023, Scotland's protected areas included 243 Special Areas of Conservation (SACs) **[See reference** 53**]**, 162 Special Protection Areas (SPAs) **[See reference** 54**]**, 51 Ramsar sites **[See reference** 55**]** and two Biosphere Reserves **[See reference** 56**]**. There are further national level designations including 1,422 Sites of Special Scientific Interest (SSSIs) **[See reference** 57**]**, 247 Marine Protected Areas **[See reference** 58**]**, and two National Parks (Loch Lomond and the Trossachs National Park and Cairngorms National Park).

4.10 The UK Biodiversity Action Plan **[See reference** 59**]** identified 39 priority habitats and 197 priority species either occurring, or known to have occurred until recently, in Scotland. The UK Biodiversity Action Plan (1994) has been superseded by the 2022 Scottish Biodiversity Strategy. The Nature Conservation (Scotland) Act 2004 contains the Scottish Biodiversity List, which

is the statutory list of species that Scottish Ministers consider to be of principal importance for biodiversity conservation in Scotland.

4.11 By May 2023, the proportion of nationally protected nature sites reported as being in a “favourable” condition decreased by 1.4% from 77.9% in 2019 to 76.4%. Despite this decrease, this represents a stable trend since the current protocols were established in 2007 (0.4% increase from 76.0%) **[See reference** 60**]**.

4.12 Areas of biodiversity value are not only found within this network of designated sites and many undesignated areas of Scotland also contain habitats and species that have important functions and roles. For example, urban greenspace such as public and private gardens, parks, woodlands, recreational grounds, green corridors, allotments and community growing spaces can provide habitats and ecosystems which are valuable to wildlife **[See reference** 61**]**. Scotland’s’ Nature Network’ is defined as a network which connects nature-rich sites through a series of suitable habitat, habitat corridors and stepping-stones. One of the main purposes of the Nature Network is ecological connectivity to allow species to adapt to pressures such as climate change **[See reference** 62**]**.

4.13 Scotland has a number of varied and ecologically complex landscapes and habitats, ranging from raised bog to native and ancient woodland, and is a home to a wide range of species.

4.14 Scotland has 90% of the high mountain habitat in the UK which accommodates some of the best examples of near-natural habitats and wildlife in the northern and remote parts of Europe. The uplands comprise bog and rough grassland, heather moorland, bracken, fen, marsh and swamp, as well as inland rock and montane habitat **[See reference** 63**]**.

4.15 The majority of upland habitat features are considered to be in favourable condition, however some, such as upland bogs have seen a reduction in the proportion of sites in favourable condition in recent years **[See reference** 64**]**.

4.16 Woodlands and forests cover 1.4 million hectares or 18% of Scotland's land area and support a wide range of important flora and fauna diversity with most rare and threatened species in Scotland found in and around semi-natural woodland. In relation to wildlife, this habitat type is in a moderately good condition with predicted improvement in the future **[See reference** 65**]**.

4.17 Wetlands, including peatlands, can be found across Scotland and are a key provider of environmental services such as carbon sequestration and water purification. Scotland's peatlands store approximately 1,600 million tonnes of carbon. Most of the wetlands which fall within protected sites are in favourable condition, however lowland raised bogs are an exception with nearly 60% of sites in unfavourable condition **[See reference** 66**]**.

Evolution of baseline – Pressure, trends and key points

4.18 Biodiversity loss has been well documented over the last 50 years, and today there are a range of pressures with the potential to impact on Scotland's wildlife and biodiversity. Key issues include climate change, land use intensification, modification and pollution **[See reference** 67**]**.

4.19 The effects of a changing climate already observed in Scotland's nature indicate some of the likely future effects. Warming has already caused earlier timing of spring events such as leaf unfolding, bird migration and egg laying. Where species adapt at different speeds this may impact on their populations. Shifts in ranges in plant and animal species have been recorded, particularly northwards, such as the comma butterfly expanding into south east and central Scotland. Movements may also occur up hillsides, and species already confined to high mountains in Scotland may be lost as conditions become unsuitable or other species replace them. In the seas, the ranges of some plankton and fish abundance are moving, with implications for populations of sea birds and other marine species. Effects on biodiversity are likely to be severe with species potentially becoming extinct in Scotland as a result of their being unable to

adapt to a rapidly changing environment. There will also be physical effects on habitats, including loss of saltmarsh and machair to coastal erosion, loss of salmon spawning beds to flash floods, and peat erosion from drying out of wetlands. There will be new risks from non-native species including pests and diseases **[See reference** 68**]**. Indirect impacts may also arise through climate change adaptation and the action taken in sectors such as renewable energy (e.g. onshore and offshore wind, solar, hydro-power, hydrogen etc.), agriculture, forestry, planning, water and coastal management in the face of a changing climate **[See reference** 69**]**. Changes in future fire risk, which will increase in likelihood and extent, may present a further risk to habitats.

4.20 Land use intensification, modification and overgrazing can lead to a reduction of diversity, quality and connectivity of landscapes and habitats. Across the uplands this is generally from increased grazing pressure and previously, forestry. In the lowlands, it is primarily via agricultural intensification, and more recently changes in grazing. Housing development is also a significant localised pressure in some parts of Scotland which is contributing to habitat loss and disturbance to species.

4.21 Pollution from industry, agriculture and road traffic also impacts on waterways, uplands, air quality and sensitive habitats. Marine exploitation is also a key pressure for biodiversity as some commercial fisheries and fishing have profoundly changed the abundance and resilience of certain species, such as cod, and altered marine environments.

Likely evolution without implementation of the plan

4.22 Without the implementation of the draft SNAP3, the following risks and threats to biodiversity from climate change are likely to continue to be experienced:

- Risks to species and habitats from pests, pathogens and invasive species.

- Loss of species and habitats from wildfires, water scarcity, and flooding from changing climatic conditions and extreme weather events.
- Shifts in species movements and loss of species unable to adapt to a rapidly changing environment.

Population and human health

Overview of baseline

4.23 The population of Scotland was estimated to be 5.4 million people in 2022. This is the largest population ever recorded by Scotland's Census **[See reference** 70**]**. The population of Scotland grew by 141,200 (2.7%) since the previous census in 2011. The increase in population is mainly as a result of inward migration, particularly to Scotland's cities. Without migration the population of Scotland would have decreased by around 49,800 since 2011.

4.24 The population of Scotland is aging with over one million people aged 65 and over (1,091,000), which is an increase of 22.5% since 2011. Life expectancy has improved over the last 40 years, however in the last 10 years improvements have stalled and most recently have started to reverse. The recent fall was mainly due to COVID-19 **[See reference** 71**]**.

4.25 Projections forecast that the population will continue to rise to around 5.53 million in mid-2033. However, it is then projected to fall by 0.6% to 5.49 million by mid-2045. Scotland's population is still projected to age with the number of people aged 65 and over projected to grow by nearly a third by mid-2045. The number of children is projected to fall by nearly a fifth. More people are projected to move to Scotland than leave each year. However, there are projected to be more deaths than births each year, and the gap between births and deaths is projected to widen. Over time, this will outweigh the growth from migration **[See reference** 72**]**.

4.26 Approximately 83% of Scotland's people live in urban areas, which account for just 2.2% of Scotland's land surface **[See reference** 73**]**. Most of the population and industry is concentrated in highly urbanised areas in the Central Belt and on the east coast, and primarily in four key city regions (Aberdeen, Dundee, Edinburgh, and Glasgow) and several smaller cities and towns (e.g. Ayr, Inverness, Perth and Stirling). There is significant variation between areas such as the Highlands and Islands and some areas in the Southern Uplands versus the more densely populated areas. Around 12.4% of the population live in small towns of less than 10,000 people; of these, around 70% are located within a 30-minute drive of large urban settlements, with the other 30% located more remotely **[See reference** 74**]**.

4.27 The Scottish Index of Multiple Deprivation (SIMD) **[See reference** 75**]** ranks small areas (data zones) in Scotland from the most deprived to the least deprived. It analyses data from several indicators across the domains of income, employment, health, education, skills and training, housing, geographic access and crime. Key findings from the 2020 Index show that 14 areas have been consistently among the 5% most deprived in Scotland since the 2004 Index of Multiple Deprivation. Of these, nine were in Glasgow City with the remainder located in Inverclyde, Renfrewshire, Highland, North Lanarkshire and North Ayrshire. Six council areas now have a larger share of the 20% most deprived data zones in Scotland compared to 2016, with the largest increases observed in Aberdeen City, North Lanarkshire, Moray, East Lothian, Highland and North Ayrshire.

4.28 Human health is dependent on a number of environmental factors including access to services such as health and education, employment, good quality outdoor recreation facilities. A high-quality environment with good air, soil and water quality is an important contributor to good health and well-being. Homes also need adequate heating and ventilation. Climate change poses a wide range of potential effects on human health. Direct impacts may include via overheating or dampness within properties or the impacts of flooding, severe weather events or wildfire. Some effects may be beneficial such as milder winters positively affecting health and cold related service disruptions, and winter viruses.

4.29 It is expected that the potential risks and benefits of climate change to population and health will be unevenly distributed. For example, areas of dense urban development will be more at risk of surface water flooding and summer heat stress. Remote coastal communities may be more vulnerable to disruption to services from extreme weather events, which could limit access to vital health services. In addition, the effects may have the greatest impact on vulnerable people. Negative health effects are likely to be disproportionately severe in areas of high deprivation because the ability of individuals and communities in these areas to prepare, respond and recover is reduced. The elderly population are also more vulnerable to climate change and associated weather events. This is due to bodies being less able to compensate for the effects, such as air pollution, with age and increased likelihood of health conditions increasing sensitivity to climate hazards **[See reference** 76**]**.

4.30 Fuel poverty is also linked to health issues. In 2023, approximately 34% of households are currently living in fuel poverty and 23% of households are living in extreme fuel poverty **[See reference** 77**]**. The statutory targets set by the Fuel Poverty Act 2019 are that by the end of 2040 no more than 5% of households will be in fuel poverty and no more than 1% of households will be in extreme fuel poverty.

4.31 Greenspace has substantial environmental and health impacts, but also links to community aspects, such as community cohesion, social connectedness and community resilience. Being able to access high quality greenspace can improve the health, wellbeing and confidence of people and communities as well as creating a sense of place. 65.4% of adults lived within a 5-minute walk of their nearest greenspace in 2016, compared to 67.2% in 2015 **[See reference** 78**]**. People living in the most deprived areas are less likely to live within a 5-minute walk of their nearest greenspace than those in less deprived areas **[See reference** 79**]**.

4.32 Key findings from the most recent Scottish Health Survey **[See reference** 80**]** found that 75% of people described their general health as ‘very good’ or ‘good’ which has increased since 2019 (72%). Average levels of mental wellbeing were lower in 2021 than in 2019 at 48.6%, with mental health

averages for women falling more than those for men. In 2021, two-thirds of adults were overweight (67%), with men showing higher prevalence of being overweight than women. 69% of adults undertook at least 150 minutes of moderate physical activity, 75 minutes vigorous physical activity, or an equivalent combination per week. This was the highest level though it has not changed significantly since 2012 (62%). Adults in the most deprived areas were more likely to have very low activity levels (57%) than those in the least deprived areas (77%).

4.33 Scotland has achieved progressively cleaner air in recent years via increasingly strict control of industrial emissions, tighter fuel and emissions standards for road vehicles and control of smoke from domestic properties. However, even at these lower levels, air pollution still causes harm to human health and the environment.

4.34 Ill health caused by air pollution is a health inequalities issue as it disproportionately affects the most vulnerable members of society, including the very young, the elderly, people with existing medical conditions and those living in deprived urban areas and deprived circumstances. While air quality is generally good in Scotland, improvements are required to reduce the adverse effects caused by air pollution particularly in urban areas. Certain pollution hotspots in Scotland have been declared Air Quality Management Areas (AQMAs). With a reduction in large-scale industry, the influence of transport, agriculture and other non-industrial sources continue to be significant sources of air pollution. Health effects range from chronic (long-term) disease and premature death to lesser symptoms affecting a large percentage of the population and contributing to greater use of medication, more days of restricted activity, more requirements for medical care. Air quality as well as nuisances such as odour, dust and noise are affected by human activities including transport, energy generation, industry, waste management, construction and agriculture, and through natural sources. This issue is discussed further in ‘**Air and climate change mitigation**’.

4.35 Water quality has seen significant improvement over the last 25 years and the majority of surface and ground waters are in good or high overall condition

and continue to improve. However, a wide range of problems exist locally including risks to human health from flood events and poor quality private water supplies. This issue is discussed further in '**Water'**.

4.36 The National Flood Risk Assessment 2018 **[See reference** 81**]** identified that there are around 284,000 homes, businesses and services across Scotland at risk of flooding from rivers, surface water and the sea, and by 2080 climate change will increase the numbers at risk by an additional 110,000 properties. This issue is discussed further in '**Flood risk and climate change adaptation'**.

Evolution of baseline – Pressures, trends and key points

4.37 Air quality is important for both short and long-term human health. In general, healthy people may not suffer from any serious health effects from exposure to the levels of pollution commonly experienced in urban environments. However, continual exposure can cause harm over the long term, and those with pre-existing health conditions such as heart disease, lung conditions, and asthma can be adversely impacted by exposure to air pollutants **[See reference** 82**]**. Research has shown that air pollution is one of the largest environmental risks to public health in the UK, reducing average life expectancy and often contributing to premature deaths **[See reference** 83**]**. Activities that generate air pollutants have been considered under the topic of Air Quality.

4.38 Transport is a significant contributor to poor air quality in urban areas **[See reference** 84**]** and emissions from transport have only declined by 19.3% since 1990 **[See reference** 85**]**. Approximately 50% of all journeys in Scotland are reported to be made by car, which is a decrease of 12.5% over 5 years, though this was affected by the COVID-19 pandemic **[See reference** 86**]**. Due to several common sources, most notably road traffic in urban areas, there is also a close relationship between air quality and environmental noise **[See reference** 87**]**.

4.39 Pressures on water quality which can affect human health is primarily caused by increases in environmental pollutants from human activities, aquaculture, intensive agriculture and urbanisation.

4.40 Flooding can have significant environmental impacts and can also affect people, communities and businesses **[See reference** 88**]**. When floods occur, they disrupt day-to-day lives and their impacts can be long lasting. Climate change is expected to increase the risk of flooding in coming years, and it also brings additional risks to human health posed by changes to air quality and rising temperatures **[See reference** 89**]**.

4.41 The potential risks and benefits of climate change on population and health will not be evenly spread. For example, pockets of dense urban development will be more at risk of surface water flooding and summer heat stress. In addition, the effects to human health from climate change may have the greatest impact on vulnerable people. Negative health effects are likely to be disproportionately severe in areas of high deprivation because of the reduced ability of individuals and communities in these areas to prepare, respond and recover **[See reference** 90**]**. Impacts on infrastructure and the services which people rely on, including impacts on the transport, water, communications and energy networks can have significant impacts on health and wellbeing.

Likely evolution without implementation of the plan

4.42 Without the implementation of a coherent adaptation plan, impacts of climate change on population and human health are likely to increase. This will include an increase in the inequality of impacts experienced, with those with lower incomes less able to respond to climate impacts, and recover. Without the implementation of the draft SNAP3, the following risks and threats to population and human health from climate change are likely to continue to increase:

- Increased risks to communities from disruption to infrastructure and transport networks
- Increased risks from exposure to high temperatures
- Increased risks to communities from flood events
- Increased impacts on coastal communities and businesses due to sea level rise, coastal flooding and erosion
- Impacts on food safety and security

Climate change mitigation

4.43 Air quality and greenhouse gas emissions are intrinsically linked as they both arise from broadly the same sources, notably transport, agriculture and energy generation. Therefore, air and climate change mitigation are considered together in this section.

Overview of baseline

Greenhouse gas emissions

4.44 The landmark 2015 Paris Agreement **[See reference** 91**]** gave rise to international consensus to keep global warming to "well below 2^{o}C above pre-industrial levels" while "pursuing efforts to limit the temperature increase to 1.5^{o}C". However, the most recently released report by the Intergovernmental Panel on Climate Change (IPCC) indicates that the world may breach the limit sooner than anticipated with the threshold being crossed permanently by the middle of the next decade due to human fossil fuel emissions **[See reference** 92**]**.

4.45 Scotland declared a Climate Emergency in 2019 and is acting accordingly to achieve net zero emissions of all greenhouse gases (GHGs) by 2045 **[See reference** 93**]**.

Scottish Greenhouse Gas Statistics 2021 (released 2023)

- Source emissions of GHGs were 41.6 million tonnes of carbon dioxide equivalent ($MtCO_2e$), an increase of 2.4% from 2020.
- The GHG Account reduced by 49.9% between 1990 and 2021. The Climate Change (Emissions Reduction Targets) (Scotland) Act 2019 **[See reference** 94**]** specifies a target reduction of 51.1 per cent reduction over the same period.

4.46 In 2021, Scotland's total emissions of the seven GHGs **[See reference** 95**]** were estimated to be 41.6 million tonnes of carbon dioxide equivalent ($MtCO_2e$), an increase of 2.4% from 2020 **[See reference** 96**]**. The main contributors to this increase between 2020 and 2021 were from domestic transport (1.1 $MtCO_2e$) following the impact of the COVID-19 lockdown in 2020, and from the residential (0.4 $MtCO_2e$) sector. Decreases in emissions were experienced in the energy, business and international aviation and shipping sectors. All remaining sectors showed relatively modest increases in the latest year. A 49.2% reduction in estimated GHG emissions between 1990 and 2021 was also reported. The most significant contributor to this overall reduction was energy supply emissions (such as power stations), with a reduction of 16.8 $MtCO_2e$ (77.6%). This was followed by reductions in emissions from 'Land use, land use change and forestry' (LULUCF) of 5.7 $MtCO_2e$ since 1990 and a reduction in emissions in waste management emissions (such as landfill) by 5.0 $MtCO_2e$ (76.2% reduction) since 1990 **[See reference** 97**]**.

4.47 Scotland's soils and peatlands are the biggest terrestrial store of carbon in Scotland with peatlands alone holding around 140 years' worth of Scotland's total annual greenhouse gas emissions **[See reference** 98**]**. Furthermore, Scotland's seas contain a wealth of blue carbon habitats such as saltmarshes, seagrass beds, kelp forests, maerl beds and biogenic reefs.

Evolution of baseline – Pressure, trends and key points

Greenhouse gas emissions

4.48 Heating makes up approximately half of Scotland's energy consumption (50.3%) compared to transport (24.5%) and electricity (21.1%) making up approximately a quarter each **[See reference** 99**]**. A breakdown of electricity and heat consumption by sector shows that three-fifths of is accounted for by the industrial and commercial sectors and two-fifths consumed domestically. Energy consumption in industry makes up approximately a third of all Scottish consumption (48.0 TWh) and has decreased by 24.1% from the 2005-07 baseline, and 3.5% down on 2017 **[See reference** 100**]**. Energy consumption in the domestic sector is next largest at 43.6 TWh, having decreased 17.2% from 2005-07. This may reflect improvements in energy efficiency in the domestic building stock in this time. Conversely, consumption in the commercial sector rose by 11.9% from the baseline to 17.1 TWh in 2018 **[See reference** 101**]**.

4.49 Renewable electricity generation is now equivalent to approximately 97% of Scotland's gross electricity consumption **[See reference** 102**]**. In 2021 renewables were the single largest source of electricity generated in Scotland at 57% **[See reference** 103**]**. In the first half of 2023, Scotland generated 16,008 GWh of renewable electricity, down 14.6% on the same point in 2022. Renewable electricity capacity has been growing steadily, having increased by 10.9% from June 2022 to 14.9 GW in June 2023 **[See reference** 104**]**. This is due to increases in onshore and offshore wind capacity over the course of 2022 **[See reference** 105**]**.

4.50 In the first half of 2023, 78% of all renewable electricity generated in Scotland was from wind **[See reference** 106**]**. Hydro is Scotland's second highest source of renewable generation, while solar capacity has increased rapidly in the first half of this decade **[See reference** 107**]**. Bioenergy and energy from waste accounts for 8.3% and whilst the current capacity of wave

and tidal is considered to be relatively small, technology is developing **[See reference** 108**]**.

4.51 As Scotland's energy mix changes over the next few years, the electricity transmission network (grid) that supports the balance between energy generation and demand will change significantly. Infrastructure will play a key role in ensuring security of supply and decarbonising our energy systems in the most cost effective, affordable way **[See reference** 109**]**.

4.52 Private and public transport declined by approximately 90% between 14th to 19th of April 2020 in comparison to the same period the previous last year. In the same time period active travel such as cycling has increased by 50% **[See reference** 110**]**. With the easing of lockdown restrictions, private vehicles have returned on the roads, however bus and rail services still experience significant drops in demand (rail: -70%, bus: - 55% for the week of 17 – 23 of August).

Effects of climate change

4.53 The effects of previous, current and future greenhouse gas emissions mean that continuing climate change is now a certainty. The extent of the effects of climate change will vary by location and projections indicate that climate change trends observed over the last century will continue and intensify over the coming decades. Key long-term climate change trends for Scotland are that weather may become more variable, typical summers will be hotter and drier, winter and autumn will be milder and wetter and sea levels will continue to rise **[See reference** 111**]** and this will have an impact on coastal landscapes. Increases in summer heat waves, extreme temperatures and drought, as well as an increase in the frequency and intensity of extreme precipitation events, are also expected **[See reference** 112**]**. Urban areas in particular will be exposed to extreme heat conditions **[See reference** 113**]**. Changing weather patterns may increase the likelihood of invasive non-native species establishing **[See reference** 114**]**.

4.54 Climate change has been identified as a primary pressure on many of the SEA topic areas (i.e. soil, water, biodiversity, cultural heritage and the historic environment). These pressures and predicted impacts have been discussed further under the individual SEA topics. The complex interaction between air quality and climate change has also been considered under the SEA topic of "Air Quality".

Carbon stores and sinks

4.55 Scotland's soils and peatlands are the biggest terrestrial store of carbon with peatlands alone holding around 3,000 megatonnes tonnes of carbon **[See reference** 115**]**; 60 times more than carbon stored by trees and other vegetation **[See reference** 116**]**. Inshore and offshore waters also store a significant resource of blue carbon, with an estimated 18 million tonnes of organic carbon stored in the top 10 cm of sediments across Scotland's seas **[See reference** 117**]**. Stocks of carbon within the habitats and surface sediments of offshore Marine Protected Areas are estimated at 9.4 Mt organic carbon and 47.8 Mt inorganic carbon **[See reference** 118**]**.

Likely evolution without implementation of the plan

4.56 There will be continued action to reduce greenhouse gas emissions across all sectors, however there will be increasing exposure to climate risks from past, present and future emissions in the absence of an adaptation plan. Natural carbon stores in terms of soils and vegetation can emit more carbon in the absence of appropriate adaptation measures. Uncoordinated and unplanned adaptation, or maladaptation, can further contribute to emissions as a result of increased demand for energy for cooling or materials required to remediate the impacts of climate change.

Air quality

Overview of baseline

4.57 The main air pollutants are nitrogen oxides (NOx), particulate matter (PMx), sulphur dioxide (SO2), ammonia (NH3), volatile organic compounds (VOCs), and ozone (O3). Sulphur dioxide, oxides of nitrogen, particulates, and low-level ozone are generally considered to be of most importance in relation to human health and the environment **[See reference** 119**]**.

4.58 In towns and cities, urban woodlands, forests and trees not only improve the general public realm but also deliver cooling, shade, better air quality and absorb CO_2 emissions.

Evolution of baseline – Pressure, trends and key points

4.59 Air quality in Scotland has improved considerably over the last few decades. Between 2005 and 2020 there were decreases of 62% for carbon monoxide (CO), 61% for nitrogen oxides (NO_x), 19% for non-methane volatile organic compounds, 46% for fine particulate matter (PM10) and 92% for SO_2 **[See reference** 120**]**. However, air pollution is still estimated to reduce the life expectancy of every person in the UK by an average of 7–8 months **[See reference** 121**]** and there are some areas of towns and cities where air quality has been identified as a concern.

4.60 Section 83(1) of the Environmental Act 1995 **[See reference** 122**]** sets out a requirement that where air quality objectives are not being met or are unlikely to be met within the relevant period, Local Authorities must designate an Air Quality Management Area (AQMA). In Scotland, 36 AQMAs are currently declared, with 14 of Scotland's 32 Local Authorities having declared at least

one. The majority of these are in urban areas as a result of NOx alone or in combination with PM10 levels, and primarily as a result of traffic emissions **[See reference** 123**]**.

4.61 Air pollution often originates from the same activities that contribute to climate change; notably transport, agriculture and energy generation. Transport is the most significant source contributing to poor air quality in urban areas **[See reference** 124**]**. While measures such as using alternative fuels sources and encouraging active travel can help improve air quality in addition to reducing GHG emissions, some measures aimed at reducing the impacts of climate change can also have a negative impact on air quality. For example, while emissions from well operated and well-maintained modern biomass boilers are generally lower than the coal equivalent, the burning of biomass feedstock does emit air pollutants such as particulates **[See reference** 125**]**.

4.62 Cleaner air provides multiple benefits and actions taken, such as a shift towards low or zero emissions transport and energy sources, should provide mutual benefits for both air quality and climate change **[See reference** 126**]**.

4.63 The Covid-19 pandemic has led to short term air quality improvements especially in urban areas mainly due to the reduction in private and public transport use. Evidence suggests that due to the pandemic, air pollution of NO2 and NOx across 7 sites in Scotland has on average decreased by -55% and -61% respectively **[See reference** 127**]**. However, such results have been gained by implementing very strict measures.

Likely evolution without implementation of the plan

4.64 The increase in temperature associated with climate change will impact on air quality in a number of ways. For example, this could lead to increases in photochemical smog. Drought episodes can also lead to emissions of volatile organic compounds from vegetation **[See reference** 128**]**. Furthermore,

increased wildfires could also impact on air quality, including from transboundary events. In the absence of measures to address these sources of air pollutants, there are likely to be increased impacts on both human health and the natural environment.

Soil

Overview of baseline

4.65 Soil is a non-renewable resource and is fundamentally one of Scotland's most important assets **[See reference** 129**]**. It supports a wide range of natural processes and underpins much of our natural environment, helping to provide a wide range of environmental, economic and societal benefits. For example, soil provides the basis for food, controls and regulates environmental interactions such as regulating the flow and quality of water and providing a platform for buildings and roads. There is an intrinsic relationship between soil health and other environmental topics; biodiversity, water and air quality in particular. For example, soil erosion is one of the main contributors to diffuse water pollution **[See reference** 130**]**.

4.66 Scotland's peatlands play a key role in regulating atmospheric pollutants, reducing flooding and benefitting biodiversity and due to this, have been afforded special protection through the Scotland's National Peatland Plan **[See reference** 131**]**. Peatlands are of particular importance for mitigating climate change by acting as carbon 'sinks'. If peatlands are in good condition, they have the ability to deposit and continually sequester new carbon in peat-forming vegetation. However, degraded soils can act as a net carbon emitter. Peatlands in Scotland extend over large areas of Scottish uplands but are most extensive in the north and west in areas with gentle slopes and poor drainage **[See reference** 132**]**. Blanket bog is the most extensive semi-natural habitat in Scotland covering around 23% of the land area **[See reference** 133**]**. Approximately 1.6 billion tonnes of the carbon stored in Scottish soils is within peat **[See reference** 134**]**. As with all soils, peats are at risk from land use

change and the effects of climate change, and their loss or degradation (and the associated loss of carbon) has the potential to be a significant contributor to Scotland's greenhouse gas emissions **[See reference** 135**]**. If Scotland lost all of the carbon stored in its peat soils as CO_2, it would be the equivalent of more than 120 times Scotland's annual greenhouse gas emissions. It is estimated that over 80% of Scotland's peatlands are degraded **[See reference** 136**]**. Land use change and management practices can impact significantly on soil carbon stores and sequestration. Energy infrastructure also poses a significant risk to soil.

4.67 The Land Capability for Agriculture (LCA) classification **[See reference** 137**]** is used to rank land on the basis of its potential productivity and cropping flexibility. Land suitable for supporting improved grassland and rough grazing extends through the Southern Uplands, northwest Highlands and Islands. Higher quality agricultural land suitable for crops is distributed throughout the Lothians, Fife, Tayside and the eastern Scottish Borders through to Ayrshire, the Clyde Valley, parts of Dumfries and Galloway and the north east of Scotland including the coastal areas around the Moray and Cromarty Firths.

4.68 The Scottish Vacant and Derelict Land Survey identifies 9,512 hectares of vacant and derelict land in 2022, which is a decrease of 3% since 2021. In Scotland 27% of the population are estimated to live within 500 meters of a derelict site, although there are regional differences. In Na h-Eileanan Siar none of the population lives within 500 metres of a derelict site whilst this is 69% in North Lanarkshire **[See reference** 138**]**.

4.69 There are around 895 important rock and landform sites in Scotland of which approximately 75% are protected as notified Earth science features in SSSIs; their condition is monitored under NatureScot's site monitoring programme **[See reference** 139**]**. Furthermore, Edinburgh, West Lothian, East Dunbartonshire, Glasgow and East Lothian have completed local geodiversity audits, which note geodiversity resources and provide information about them **[See reference** 140**]**.

Evolution of baseline – Pressure, trends and key points

4.70 Climate change and loss of organic matter pose significant threats to Scottish soils, with both likely to affect soil function, including loss of soil carbon. The loss of valued soils in particular has the potential for national impacts which will be difficult to reverse. In the case of climate change, these impacts have the potential to be felt on a global scale **[See reference** 141**]**. As such, the management and use of these resources can affect the amount of CO_2 that is held or released.

4.71 Changes in land use and land management practices are also key pressures on soil. These include activities such as energy infrastructure, transport and development, including road building and the expansion of agriculture and forestry **[See reference** 142**]**. In Scotland, the percentage of land affected by soil sealing increased between 2009 and 2019 from 1.5% to 1.9%. There is some regional variation with the Clyde and Forth regions having the highest percentage of land affected by soil sealing at 5% and the West Highland and Argyll regions experiencing below 1%. It is estimated that 1,400 hectares of Scottish land is sealed every year **[See reference** 143**]**.

4.72 Soil contamination can also arise from many causes, including atmospheric deposition, agriculture and forestry operations, mining and historic land contamination, and can impact on soil function and biodiversity **[See reference** 144**]**.

4.73 Threats from erosion are of localised significance, however, they can also lead to loss of important functions. Changes in vegetation also alter soil biodiversity which can significantly affect soil as a habitat and the functions it sustains.

4.74 The percentage of vacant and derelict land throughout Scotland has been steadily decreasing since 2009.

Likely evolution without implementation of the plan

4.75 Without the implementation of the draft SNAP3, adverse effects on soil resulting from climate change will continue (including seasonal aridity and wetness), exacerbating soil compaction, erosion and flooding. Opportunities to restore degraded carbon stores, particularly peatlands, may not be fully realised.

Water

Overview of baseline

4.76 Scotland's water provides a wide range of benefits that support our health and prosperity, such as the provision of drinking water and as a resource for use in agriculture and industry **[See reference** 145**]**. It can also be used as an energy source through hydro-power schemes, tidal and wave energy, and hydrogen technologies. These water resources also support a rich diversity of habitats and species, attract tourism, promote recreation and provide for the sustainable growth of the economy **[See reference** 146**]**.

4.77 In recent decades, significant improvements to water quality in many rivers, canals, and estuaries have been observed alongside significant reductions in pollution **[See reference** 147**]**. Most of Scotland's seas, coasts, and estuaries are in good or excellent condition; however, some localised areas of concern remain. Nearly half of rivers in Scotland are now in good condition or better and almost two thirds of lochs surveyed were found to be in good or high condition **[See reference** 148**]**.

4.78 Scotland's groundwater is a valuable asset for many, particularly rural communities where it provides most of the private drinking water (75%) **[See**

reference 149**]**. Around 80% of Scotland's groundwater is in good condition, although there are particular regions with widespread problems; for example, in the Central Belt **[See reference** 150**]**. Agriculture and the legacy of industrial activity are the main causes of regional-scale groundwater problems, whereas inadequate construction of private water supplies and inappropriate management of wastes can create localised problems **[See reference** 151**]**.

4.79 Changes in precipitation including drought can impact on water availability, with negative effects on communities, business and industry and habitats. Low flow conditions can concentrate pollutants and increased water temperatures can reach levels which cause fish mortality.

Flooding

4.80 It is predicted that the greatest direct climate change-related threats for the UK are large increases in flood risk, exposure to high temperatures and heat waves; shortages in the public water supply and for agriculture, energy production and industry; substantial risks to UK wildlife and natural ecosystems, risks to domestic and international food production and trade **[See reference** 152**]**. Flood risk can arise from rivers, surface water, ground water or coastal flooding **[See reference** 153**]**:

- River (fluvial) flooding - this occurs when the water draining from the surrounding land exceeds the capacity of the watercourse.
- Coastal flooding – is caused by high sea levels, waves overtopping defences or the inundation of low-lying land at the coasts or in estuaries. Coastal flooding is often linked to coastal erosion.
- Surface water (pluvial) flooding - is caused when rainfall water ponds or flows over the ground before it enters a natural or man-made drainage system or watercourse; or when water cannot enter the drainage system because the system is already full to capacity.
- Groundwater flooding - this occurs when water levels in the ground rise above surface levels.

- Sewer flooding - this occurs when combined sewers are overwhelmed by heavy rainfall. Sewer flooding is often closely linked to surface water flooding and may contain untreated foul water.

4.81 Flood risk resulting from failure of infrastructure, such as dams or canal embankments, can also be exacerbated as a result of climate change, as exemplified by the Union Canal breach of 2020.

4.82 Coastal infrastructure is particularly vulnerable to coastal flooding. Scotland has £18bn of buildings and infrastructure within 50 m of the shoreline. Three-quarters of these assets are protected by natural defences (£13bn) such as sand dunes; compared with artificial defences (£5bn) such as sea walls **[See reference** 154**]**.

4.83 Flooding can have significant and long-lasting impacts on people, communities, and businesses. Flood Risk Management Strategies **[See reference** 155**]** co-ordinate action to tackle flooding in Scotland, setting out the national direction for flood risk management and helping target investment and coordinate action across public bodies. Flood maps have also been produced which help to show where areas are likely to be at risk of flooding from rivers, seas and surface water **[See reference** 156**]**.

4.84 The natural environmental also plays a role in mitigating flood risk, providing water storage and slowing run off. Scotland's peatlands play an important role in natural flood management. Peatland has the ability to soak up and store vast quantities of water, particularly in pools, hollows and depressions, thereby slowing flow of water through a catchment. This can prevent flooding downstream within catchments, particularly if large areas of peatland are present upstream **[See reference** 157**]**. Likewise, other habitats such as woodland may also contribute towards natural flood management. Woodland and forestry can help prevent flooding by intercepting precipitation, reducing surface water runoff through increased infiltration, increased use of water through evapotranspiration **[See reference** 158**]**. Fallen branches and trees may also create natural damns along watercourses, helping to slow the flow of the water.

4.85 Within urban areas, reducing the area of hard surfacing and introducing measures such as SuDS and green infrastructure have been shown to reduce run off.

Evolution of baseline - Pressures, trends and Key points

4.86 Key pressures on the surface water environment include urbanisation, an increase in invasive non-native species, intensive agriculture/aquaculture and climate change. Rural and urban diffuse pollution remains a concern for water quality, particularly in relation to agriculture, forestry, and urban development **[See reference** 159**]**.

4.87 Airborne pollution, particularly associated with vehicle emissions can impact upon water bodies. Heightened nitrogen concentrations can cause the acidification and eutrophication of water bodies. Eutrophication occurs when the concentrations of otherwise limiting nutrients increase, allowing aquatic plants and algae to grow unchecked and depleting oxygen levels.

4.88 The predicted effects of climate change such as increased temperatures and changes to rainfall patterns could affect flows in rivers and impact on water resource availability **[See reference** 160**]**. A changing climate is also expected to have ecological impacts, such as warmer sea temperatures and an increasing risk of non-native species spreading and becoming established in water environments **[See reference** 161**]**.

4.89 The risk of flooding from rivers, surface waters and sea is predicted to increase. This can damage material assets, pose risks to population and human health through the spread of infectious diseases and also lead to a loss of habitats, resulting from erosion. It also increases risks to communities, businesses and infrastructure. Development can also lead to diffuse pollution in surface water. Water quality is considered “good” or better in 87% of Scotland’s waters; this is compared to 82% in 2015 **[See reference** 162**]**. Scotland’s WFD

aquatic monitoring strategy is to ensure that sufficient environmental data is collected to ensure that progress is being made towards the EU's Water Framework Directive **[See reference** 163**]**. The development and operation of new infrastructure has the potential to negatively impact on water quality, either during construction or via pollution run-off. New structures on land can also affect the capacity of flood plains or flood defences.

Likely evolution without implementation of the plan

4.90 Without the adaptation action contained within SNAP3, it is likely that many of the climate risks associated with the water environment will continue to increase. Key impacts are likely to result from more frequent and severe flooding, periods of water shortage, deteriorating water quality during flood and low flow conditions and damage to aquatic and marine habitats and species.

Cultural heritage including architectural and archaeological heritage

Overview of baseline

4.91 Scotland's many and varied historical sites are unique and irreplaceable. These sites and features are regarded as making a valuable contribution to our quality of life, cultural identity, education and economy. While these assets are distributed widely throughout Scotland, there are clusters of sites in and around our settlements and also around our coastlines.

4.92 Designated assets in Scotland currently include six World Heritage Sites, 47,613 Listed Buildings, 8,336 Scheduled Monuments, 672 Conservation Areas, 390 Designed Gardens and Landscapes, 8 Historic Marine Protected

Areas, 8 Scheduled Wrecks, and 40 Nationally Important Battlefields **[See reference** 164**]**. Scotland also has two National Parks and 40 National Scenic Areas which contain many important features of the historic environment.

4.93 CANMORE contains more than 330,000 records and 1.5 million catalogue entries for archaeological sites, buildings, industry and maritime heritage across Scotland. However, whilst most of the historic environment is undesignated (90-95%), these known but undesignated assets provide important contextual information which helps us better understand designated sites **[See reference** 165**]**.

Evolution of baseline – Pressures, trends and key points

4.94 83% of Scheduled Monuments are considered to be in an optimal or generally satisfactory condition and 750 historic buildings on the Buildings at Risk Register have been saved between 2009 and 2018, with more than 200 others in the process of being restored **[See reference** 166**]**.

4.95 Development is a key pressure on the historic environment and cultural heritage, both directly in terms of damage to known and unknown features, and the potential for impacts on setting. Other known pressures include changing land use and land management, tourism/visitors, pollution and climate change.

4.96 Key impacts of climate change on the Scotland's historic environment have been identified by Historic Environment Scotland's Climate Change Risk Assessment **[See reference** 167**]** as:

- Rising sea levels
    - Since 1900, sea-levels around the UK have risen by 15 to 20 centimetres, with climate change projections indicating that by 2100 there could be a further rise of between 50 and 100 cm. This has clear, severe implications for our sites located on the coast. 8% of sites are

located within just 10 meters of the shoreline, and 14% within 50 metres. Many of these sites have been classified as being at 'Very High' risk of coastal erosion and flooding in the risk assessment.

- Increasing frequency and intensity of rainfall

  Scotland is expected to see continually wetter winters and drier summers, with more frequent intense spells of rain. This will result in:

  - Increased flooding:
  - On a large scale, heavy and intense rainfall can directly lead to flooding in a short time frame, which has the potential to cause catastrophic damage to all elements of the historic environment within reach of potential flood zones.
  - 55 of 336 Properties in Care (PICs) of HES are identified as being at 'High' or 'Very High' risk of fluvial flooding.
  - Increase in the number of landslides.
  - Ground instability issues- this has a range of negative effects, including the movement of building foundations and the disturbance of known and unknown buried archaeological remains.
  - Deterioration of stone work.
  - Adverse effects on the long-term survival of archaeological remains via a fluctuating water table or wetting and / or drying of archaeological deposits under the topsoil.

- Increasing temperatures

  - Warmer and drier summers with longer dry spells will increase the likelihood of wildfires- damage known and unknown archaeological deposits and alter the visual appearance of historic landscapes and gardens.
  - The creation of new and more favourable habitats for damaging pest species- vulnerable components such as textiles and wood are at risk from pests including the Clothes Moth and Carpet Beetle.

- Changes in vegetation patterns

Increasing annual temperatures and seasonal variations in the amount of rainfall across Scotland will create conditions that are favourable to increasing levels of biogenic growth. This will result in:

- A longer growing season- this can have wide ranging impacts on the historic environment, including exacerbating damage via vegetation growth on historic buildings and enhanced rates of biodeterioration, through both chemical and physical processes.
- Changing distributions of plant species- this will change the character of historic landscapes and also has the potential to introduce aggressive species that could cause damage to other plant types, as well as to the fabric of historic buildings and collections.

4.97 These threats will grow in the future, given the future predictions of the likely effects of global warming and climate change for the remainder of this century.

4.98 Such a broad range of climate change impacts will result in a broad range of adaptation action required to support Scotland's historic environment, for example, more regular condition checking and maintenance, improved or new protective weathering details, adapting or improving rainwater systems and drainage. However, there may be secondary impacts as a result of such climate change adaptation actions, including infrastructure developments and land use and management changes.

Likely evolution without implementation of the plan

4.99 The draft SNAP3 will support retrofit measures to existing developments that reduce emissions or support adaptation to climate change, e.g. by ensuring historic buildings are wind and water-tight with good ventilation systems to respond to a shift in climatic changes. It will also support the development of new innovative solutions to restore and maintain heritage sites. Without the

implementation of the draft SNAP3, the adverse effects of climate change from increased weathering and corrosion will continue to damage heritage assets.

Landscape, townscape and seascape

Overview of baseline

4.100 Scotland's distinctive landscapes, seascapes and townscapes are a significant part of the country's natural and cultural heritage and make an important contribution to the economy and the wellbeing of the population. Scotland's landscapes, seascapes and townscapes play a key role in attracting tourism, affording opportunities for business and providing the setting for outdoor recreation.

4.101 There are currently two National Parks (Loch Lomond and The Trossachs, and the Cairngorms) and 40 National Scenic Areas in Scotland. Over 13% of Scotland's land area has been classified as a National Scenic Area **[See reference** 168**]**. Designations such as Local Landscape Areas, Special Landscape Areas, Regional Scenic Areas and Areas of Great Landscape Value have also been established at a regional and local level by many local authorities **[See reference** 169**]**. These areas of important nature or landscape value have been designated locally for conservation purposes and are afforded protection from inappropriate development **[See reference** 170**]**. 42 Wild Land Areas are also recognised as nationally important in Scotland reflecting landscapes with minimal human influence.

Evolution of baseline – Pressures, trends and key points

4.102 Scotland's landscapes are constantly changing and evolving in response to both natural processes and the changing demands of society. Changes in landscape tend to occur over long periods of time, and gradual change, as a result of development such as housing and renewable energy can be difficult to determine **[See reference** 171**]**.

4.103 Climate change is expected to lead to extensive landscape change across Scotland and is viewed as an increasing pressure on landscape, not only as a result of direct effects but also as a result of indirect impacts **[See reference** 172**]**. Direct impacts are likely as a result of changing temperatures and patterns of precipitation, weather events and sea level change **[See reference** 173**]**. Other commitments to adapting to the predicted effects of climate change, for example, the development of renewable energy (such as wind farms, hydro-power schemes, solar power and hydrogen technologies) is seen by many as a pressure on both visual amenity and the character of many rural landscapes. The construction of new transport infrastructure and working towards a national target for increasing forest cover in Scotland also has the potential to affect our landscapes and seascapes.

4.104 The greatest changes are likely to be seen in areas of highest population, such as lowland and coastal areas. Mitigation and adaptation measures are expected to have a greater influence on both Scotland's landscapes and the quality of life than that of the direct effects of climate change **[See reference** 174**]**.

4.105 The coast and foreshore are under many pressures particularly from climate change, rising sea level and coastal erosion. These areas are also very important recreational resources, which is dependent on the landscape and environmental quality of these areas. The seascape surrounding terrestrial Scotland is also impacted by the development of marine aquaculture. Aquaculture development is predominantly located along the western and

northern coasts of mainland Scotland, as well as around many of the offshore islands. The continual development of marine aquaculture has the potential to impact coastal character and visual amenity, if poorly sited or designed. In addition to aquaculture development, energy generation development, including on and offshore windfarms can impact landscape and seascape if poorly sited and designed.

4.106 Development and changes in land use related to urban expansion-associated infrastructure, is also a key pressure and the distinctive landscape settings of many towns and cities is being lost as a result of settlement expansion and infrastructure requirements.

Likely evolution without implementation of the plan

4.107 Without the implementation of the draft SNAP3 and its proposed adaptation actions, coastal flooding and erosion will continue resulting in the loss of low-lying areas of land to the sea. Native woodlands could be colonised by other species and damaged by storms. Rivers, burns and lochs will continue to experience more frequent flood events.

4.108 The impacts of unmanaged change could include landscape change resulting from flood damage, coastal change and wildfire. There could be increases in pests and disease which impact on key species within the landscape and lead to losses of trees, crops and livestock. Although action which supports adaptation would still take place without the implementation of the draft SNAP3, these actions would happen at a slower pace and within a less coordinated framework.

Material assets

Overview of baseline

4.109 While existing policies relating to energy, waste, transportation and land use are wide-ranging, they largely share the aims of contributing to core planning objectives, supporting sustainable development, reducing GHG emissions, and making the best use of Scotland's resources and existing infrastructure.

4.110 Scotland's natural resources are also material assets. Mineral resources and aggregates are used for purposes such as fuel (e.g. coal), and construction (e.g. sand gravel and rock). However, the quantity of these resources is finite and once they are used up, they cannot be replaced.

4.111 Waste management, transportation and efficiency in energy generation and land use form key aspects of the draft update and have the potential for environmental impacts. Environmental baseline information relevant to each of these sectors is presented in the following sections.

Energy

4.112 Heating makes up approximately half of Scotland's energy consumption (50.3%) with transport (24.5%) and electricity (22.1%) making up approximately a quarter each **[See reference** 175**]**. A breakdown by sector of non-transport energy consumption shows that 59.9% is accounted for by industrial and commercial sectors, with 40.1% consumed domestically **[See reference** 176**]**. Domestic consumption of electricity and heat dropped by 17.2%% in 2018, compared to the 2005-2007 baseline. Energy consumption in transport increased slightly in 2018 by 0.7%. It is estimated that industrial energy consumption has dropped by 24.1% but commercial consumption rose by 11.9% compared to the 2005-2007 baseline **[See reference** 177**]**.

4.113 Scotland's energy consumption increased by 2.3% from 2020 to 2021, driven by a 19.0% increase in transport consumption largely caused by the lifting of COVID-19 restrictions. Overall energy consumption is 18.2% lower than the 2005-2007 baseline **[See reference** 178**]**.

4.114 In the first half of 2023, Scotland generated 16,008 GWh of renewable electricity, down 14.6% on the same point in 2022. Scotland's renewable electricity capacity increased by 10.9% from June 2022 to 14.9 GW in June 2023. These trends seen are mainly due to less wind and rain in the first half of 2023 compared to the same period in 2022 **[See reference** 179**]**. Renewable electricity generation is now equivalent to approximately 97% of Scotland's gross electricity consumption **[See reference** 180**]**.

4.115 There have been significant changes to the electricity generation mix in recent years with the vast majority of the electricity that Scotland generated from low carbon sources. In turn, fossil fuel generation is at its lowest level, with just 10.5% of all electricity generated from oil and gas, compared to 48.4% in 2010 **[See reference** 181**]**.

4.116 In the first half of 2023, 77.9% of all renewable electricity generated in Scotland was from wind. Hydro is Scotland's second highest source of renewable generation (13.3%) **[See reference** 182**]**. The remaining 8.8% was produced by other renewable energy technologies. Solar capacity has increased rapidly in the first half of this decade. Bioenergy and energy from waste accounted for 6.6% over overall renewable electricity generated in Scotland in 2022 **[See reference** 183**]** and whilst the current capacity of wave and tidal is considered to be relatively small, technology is developing and Scotland benefits from significant resource potential in these areas. At a domestic level, Scotland is reliant on gas as the primary heating fuel for homes, with 80% of Scotland's 2.5 million dwellings using gas **[See reference** 184**]**. However, almost 20% of Scottish domestic consumers live in an off-gas grid area, with the highest proportion of off-grid properties found in the Highlands and Argyll and Bute **[See reference** 185**]**.

4.117 In 2019, the equivalent of 6.5% of non-renewable heat demand was met by renewable sources, an increase from 6.2% in 2018. A rise in the generation of renewable heat by biomethane is attributed to this increase. Thermal energy from waste and heat pumps make up 7% and 8%, respectively, of renewable heat output **[See reference** 186**]**.

4.118 Since 2000, Scottish renewables have displaced an estimated 124 million tonnes of CO_2 **[See reference** 187**]**, assuming that the same amount of electricity generation would have been generated by fossil fuels **[See reference** 188**]** In 2007 alone, Scottish renewable electricity displaced an estimated 11.6 million tonnes of CO_2 **[See reference** 189**]**.

Transportation

4.119 Transport and travel habits in Scotland were profoundly affected by the COVID-19 pandemic, with restrictions on travel and daily activity in place for large parts of 2020 **[See reference 190]**. The following paragraphs summarise the Transport Scotland Scottish Transport Statistics 2022.

4.120 The estimated volume of traffic on Scotland's roads in 2021 was around 43 billion vehicle km: 15% more than 2020. Since COVID-related restrictions have lifted there has been a recovery in the amount of road traffic. There had been slight increases in the previous eight years, following the steady downward trend seen between 2007 and 2011. In 2021, cars accounted for over three quarters (72%) of the total volume, while light goods vehicles and heavy goods vehicles contributed 20% and 6% respectively. Much smaller volumes were recorded for two wheeled vehicles, buses and cyclists. In 2020, 98% of all road vehicles in Scotland were fuelled by either petrol or diesel and there were 56,959 kilometres of public road. In 2021-2022 compared to the previous year, there was a 55% increase in the volume of trunk road that was newly constructed, reconstructed, strengthened, or surface dressed, primarily driven by a fall in new roads constructed / opened. The number of ultra-low emission vehicles registered in Scotland for the first time so far in 2021 is 91% up on the corresponding figure in 2020 (January – September).

4.121 The total route length of the railway network in Scotland is 2,744 kilometres, of which 904 kilometres is electrified. In addition to freight only stations, there are 360 passenger and parcel stations.

4.122 234 million journeys were made by bus in 2021-22. This is an increase of 87 per cent on 2020-21. Almost two fifths of these were made under the National Concessionary Travel Scheme. Passenger journeys in Scotland have fell by 40% over the past five years. The declining trend in bus use contrasts with train travel in Scotland. Train accounts for only a quarter of the passenger journeys made by bus, but saw steady increases in passenger numbers over the years leading up to the Covid-19 pandemic.

4.123 There were 7 million air passengers at Scottish airports in 2021, slightly less than in the previous year. Passenger numbers increased by 39% between 2010 and 2018 reaching a peak of 29.4 million before falling 318% to 7 million in 2021 due to the pandemic and associated travel restrictions. In 2021, Edinburgh had the highest number of terminal passengers at 3 million, though this was a 13% decrease on the previous year. A number of smaller airports are also run by Local Authorities in Scotland such as Oban Airport, and some of these provide connections to more remote areas.

4.124 Scotland's marine areas and coastal waters are utilised by a wide range of vessels and service a variety of industries. Ports and harbours are located all around the Scottish coastline. Waterborne freight (both incoming and outgoing) passing through all ports decreased by 1.5% in 2020 to 58 million tonnes. This was 25% less than in 2010, continuing a steady fall. In addition to being an important means of distributing goods, the shipping sector also helps deliver lifeline ferry services, which are vital to island communities. A total of 6.3 million passengers travelled on ferry routes within Scotland in 2021. Larger ports such as Cairnryan support ferry services between Scotland and Northern Ireland with a further 1.4 million passengers travelling to Northern Ireland in 2019.

Waste

4.125 The total amount of household waste generated in Scotland was 2.33 million tonnes in 2022, a decrease of 148,000 tonnes (6.0%) from 2021. This is the lowest amount of Scottish household waste generated that has been recorded since 2011 **[See reference** 191**]**.

4.126 For 2022, the Scottish household waste recycling rate was 43.3%, an increase of 0.3 percentage points from the 43.0% rate achieved in 2021. However, the overall amount of household waste recycled between 2021 and 2022 decreased by 56,000 tonnes (5.2%) to 1.01 million tonnes, broadly in line with the reduction in household waste generated. The reduction in waste generated and waste recycled follows a previous spike from 2020 to 2021, which was attributed to the impact of the COVID-19 lockdown and other restrictions **[See reference** 192**]**.

4.127 As of 2022 there are 1,278 waste sites in Scotland, with an annual capacity of approximately 83.5 million tonnes and 19.7 million tonnes of waste accepted. There are 405 landfill sites, with a total landfilled wate of 2.4 million tonnes, annual landfill capacity of 12.8 million tonnes and 28.6 million tonnes of remaining capacity **[See reference** 193**]**.

4.128 The total quantity of waste landfilled in Scotland in 2022 was 2.4 million tonnes, a decrease of 631,000 tonnes (21.0%) from 2021. This continues a long-term trend, with a reduction of 4.7 million tonnes (66.4%) since 2005, and is the lowest annual amount on record of waste landfilled since then. Most of the decrease in 2022 was due to a reduction in Sorting residues landfilled and Soils landfilled. The top three categories of waste landfilled in 2022 were Household and similar wastes (744,000 tonnes, 31.4% of total), Soils (657,000 tonnes, 27.7% of total) and Sorting residues (656,000 tonnes, 27.7% of total) **[See reference** 194**]**.

4.129 The carbon impact of Scottish household waste generated and managed in 2022 was 5.5 million tonnes of carbon dioxide equivalent (TCO2e), which is

the equivalent to 1.02 TCO2e per person. This was a decrease of 357,000 TCO2e (6.1%) from 2021, and a reduction of 1.22 million TCO2e from 2011 **[See reference** 195**]**.

Evolution of baseline – Pressures, trends and key points

4.130 As Scotland's energy mix changes over the next few years, the electricity transmission network (grid) that supports the balance between energy generation and demand will change significantly. For example, as a result of the increased electrification of the transport and heat network. Infrastructure will play a key role in ensuring security of supply and decarbonising our energy systems in the most cost effective, affordable way **[See reference** 196**]**. Energy storage is likely to be an increasingly important part of the transition to delivering clean, affordable and secure supplies of energy **[See reference** 197**]**. For example, the continued development of battery storage technologies and hydrogen fuel cells for vehicle use in the transport sector.

4.131 Flooding poses one of the greatest long-term climate related risks to infrastructure performance. However, growing risks posed from heat, water scarcity and slope instability could also prove significant **[See reference** 198**]**. Severe weather events can exacerbate these risks with storm damage and wildfire risk significant for the electricity transmission network. These events can also impact on energy generation, including effects from water scarcity impacting on hydro power production, and severe winds impacting on wind energy production.

Likely evolution without implementation of the plan

4.132 Without implementation of SNAP3 it is likely that critical infrastructure will become more vulnerable to severe weather events, and also associated coastal erosion. This includes impacts on the energy network, water supply, communications and transport infrastructure increasing the risk of cascading systems failures affecting communities and businesses across Scotland. This will have implications for Scotland's economy, including GDP. Direct impacts on physical infrastructure such as buildings, including risks from severe weather, and overheating will also impact on delivery of services, wellbeing and human health.

Chapter 5

Strategic Environmental Assessment Findings

5.1 This chapter of the Environmental Report sets out the assessment findings and the significant environmental effects of the Draft SNAP by outcome. The assessment identifies effects arising directly from the draft SNAP and any effects, which would indirectly impact on the baseline environment. The effects have been assessed against each SEA topic while taking into consideration the SEA objectives within the assessment and the impact of the draft SNAP on the environmental baseline.

Outcome 1: Nature Connects

5.2 Nature based solutions covers the subobjectives; ‘Flood resilience and coastal change’, ’Blue-green infrastructure investment’, ‘Freshwater habitats’, ‘Landscape Scale Interventions’, ‘Soil-Health’ and ‘Development planning’.

5.3 Under the ‘Flood resilience and coastal change’ subobjective, a draft Scottish Biodiversity Strategy Delivery Plan 2025-2030 has been developed, including surface water management and the Scottish Government’s (SG) Wastewater and Drainage Policy Consultation was undertaken. The principles of sustainable flood risk management and blue-green places will be integrated into policy and the SG will develop the flood resilience strategy and coastal change adaptation plans. Additionally, SEPA will review Natural Flood Management and Natural Susceptibility to Coastal Erosion Maps. The ’Blue-green infrastructure investment’ sets out FIRNS and that the SG will establish Opensource platform for GBI finance by 2030. Current actions for ‘Freshwater habitats’ are the Scottish wild salmon strategy and accompanying 5-year Implementation plan. In the future outcomes for the monitoring and assessment of Scotland’s Salmon in line with the plan will be established. Current actions

surrounding ‘Landscape Scale Interventions’ include Scotland’s Third River Basin Management Plan for Scotland 2021-2027 and the Third Land Use Strategy. Scotland’s LUS4 and Land Use and Agriculture Just Transition Plan is due for publication. Current actions regarding ‘Soil-Health’ include conducting a capacity building project to assess the socio-economic impacts of soil degradation on Scotland's water environment and the draft Scottish Biodiversity Strategy Delivery Plan.

5.4 Current actions under the ‘Development planning’ objective include the NPF4 and the SG’s support with the preparation of a new round of Local Development Plans. SEPA is currently supporting the evidence gathering stage of LDPs. Additionally, the Planning (Scotland) Act 2019 introduced a new duty on planning authorities to prepare and publish an open space strategy. Further planning actions include new transport and active travel infrastructure project to incorporate elements of blue-green infrastructure by 2030.

5.5 The ’Nature Networks’ objective includes the subobjectives; ’Nature Networks’, ‘INNS’ and ‘Vector Borne Disease’. ‘Nature networks’ sets out that a draft Nature Network Framework has been published, and going forward the SG will work with local authorities to ensure nature networks are implemented. Under ‘INNS’ the Marine Directorate Science, Evidence, Data and Digital portfolio is scoping a programme of work measure the impact and find better control methods of INNS. Outreach is underway to ports and harbours to enable improved INNS monitoring and biosecurity. New actions include the SG to implement a Scottish Plan for INNS control, strategic INNS projects, raise public awareness, establish a monitoring programme for marine INNS and develop best practice guidelines for biosecurity. Under ‘Vector borne disease’ the SG will continue to work with partners to provide vector-borne disease surveillance, risk assessment, incident management and public health and veterinary advice and horizon-scan for diseases of livestock. New actions involve improved research on enhanced surveillance and mapping the risk of emergent vector-borne disease due to climate change.

5.6 Marine Ecosystems and the Blue Economy include ‘Marine Planning’, ‘Biodiversity and habitat restoration’ and ‘Coastal’.

5.7 Under ‘Marine Planning’ the current national marine plan and future national marine plan 2 will help achieve climate change mitigation and adaptation objectives. Other current actions include the Marine Climate Change Impacts Project (MCCIP) and an CVA methodologies review. Current actions set out in ‘Biodiversity and habitat restoration’ include Scottish Marine Environmental Enhancement Fund (SMEEF) and ensuring Scottish MPA network is well managed. New actions include developing the marine restoration plan, MPA management, completing a review of opportunities for increasing community participation in safeguarding marine biodiversity, reviewing how to mainstream marine biodiversity into government decision-making, a Scottish Seabird Conservation Strategy, implementation of actions in the UK Dolphin and Porpoise Conservation Strategy and reviewing the approach to and locations of designated seal haul-out sites. Through ‘Coastal’ the SG will work with LA’s to improve the resilience of our valuable natural coastal defences. To assist the SG published new Coastal Change Adaptation Planning Guidance. In the future SEPA will update its coastal flood risk maps.

5.8 ‘Natural Carbon Stores and Sinks’ Objective includes ‘Peatland’, ‘Forestry and Woodland’, ‘Agriculture’ and ‘Blue Carbon’.

5.9 Ongoing actions under ‘Peatland’ includes the commitment to restore 250,000 hectares of degraded peatlands by 2030, alongside other management and protection actions. Additionally, including carbon rich soils in the preparation of blue and green infrastructure audits and/or strategies and identifying nature networks in Local Development Plan preparation. In the future evidence/monitoring data will be used to target restoration and maximise co-benefits and grouse moor management and muirburn regulations will be introduced. Under ‘Forestry and Woodland’ the Right Tree in the Right Place Guidance, commitment to reaching woodland creation targets, the WCC, Control of Woodland Removal & Implementation Guidance, the Scottish Forestry Strategy objectives and increasing the contribution of forestry to wider land use adaptation are the identified current actions. Future actions include reviewing the Right Tree Right Place Guidance and support training and implementation of the updated UK Forestry Standard General Forestry Practice Guideline. Current actions set in ‘Agriculture’ involve Preparing for Sustainable Farming funding scheme. Future actions involve the ‘Whole Farm Plan’. ‘Blue

carbon' includes the Scottish Blue Carbon Forum and the future development of a Blue Carbon Action Plan.

Climate change mitigation

5.10 The majority of the objectives within the Nature Connects outcome are expected to have positive effects in relation to the climate change mitigation SEA objective. Over half of these are identified to have significant positive effects, in particular for the outcomes of 'Nature Networks', 'Marine Ecosystems and the Blue Economy' and 'Natural Carbon Stores and Sinks'.

5.11 All five objectives include actions which may result in increased carbon sequestration from actions such as woodland planting and improved management, peatland restoration, increased blue and green infrastructure, habitat restoration and monitoring and removal of invasive species. Furthermore, actions within 'Marine Ecosystems and the Blue Economy' will result in the enhancement and restoration of blue carbon space which will enhance ecosystem services, increasing carbon sequestration. In addition, the outlined coastal monitoring and adaptation will support climate mitigation through protecting coastal habitats, increasing the resilience of associated carbon stores. Actions outlined in 'Natural Carbon Stores and Sinks' will also restore ecosystem services, further enhancing climate stores.

5.12 In addition, actions within 'Natural Carbon Stores and Sinks' will result in an increase in knowledge and restoration of Scotland's marine inshore areas, which is likely to contribute positively to climate change mitigation through the restoration of blue carbon hot spots, delivering greater sequestration and reduced emissions. Likewise, as set out in the Vision for Agriculture, there are targets to increase on-farm carbon sequestration. These actions are likely to restore ecosystem services, further enhancing climate stores.

Climate change adaptation

5.13 For the ‘Nature Networks’, ‘Marine Ecosystems and the Blue Economy’ and ‘Natural Carbon Stores and Sinks’, significant effects are expected for a majority of the subobjectives, and for ‘nature-based solutions’ and ‘development planning’, the majority of subobjectives are expected to have minor positive effects regarding climate change adaptation for this outcome.

5.14 Furthermore, through the preparation of open space strategies, increased delivery of green and blue infrastructure, promotion of natural solutions to reduce flood risk, restoration of degraded peatland, woodland and marine inshore areas and an increase in sustainable and regenerative agriculture, will increase resilience to climate risk. This will be through actions which provide habitats for nature to adapt and which contribute to natural solutions to for flood risk mitigation, shading and cooling air. Additionally, increasing the resilience of habitats through increased knowledge around blue carbon stores and the ‘woodland adaptation and work programme’ will further increase resilience.

5.15 SEPA evidence gathering could contribute to climate change adaptation through providing an enhanced evidence base on the water environment, and potentially how it can adapt to climate change as well as flooding. This evidence base could provide a baseline for spatial strategies within Local Development Plans to help local authorities adapt to severe weather events as a result of climate change.

5.16 Additional research, reporting and knowledge on wild salmon will support actions to allow this species to adapt to climate change in the longer term.

5.17 Research, increased surveillance and risk management of invasive species and vector borne disease, as well as removal of INNS allows recovery of native flora and fauna which increases the resilience of natural habitats, agricultural systems and urban areas to climate change. These benefits will increase as the vegetation matures.

5.18 Existing and ongoing actions will be delivering benefits already, however future actions will bring benefits in the longer term as changes are implemented and improved evidence informs future management actions.

Biodiversity, flora and fauna

5.19 The majority of the subobjectives under ‘Nature-based solutions’, ‘Nature Networks’, ‘Marine Ecosystems and the Blue Economy’ and ‘Natural Carbon Stores and Sinks’, have significant positive effects for biodiversity, flora and fauna. For ‘development planning’, the majority of subobjectives are expected to have minor positive effects regarding biodiversity, flora and fauna.

5.20 Enhancing habitat networks in urban areas, increasing blue-green infrastructure, protecting coastal landforms, open space strategies, SEPA evidence gathering, nature networks implementation, research on INNS and vector borne disease, marine biosecurity efforts, integrating biodiversity protection into plans and policies, peatland, woodland and blue carbon habitat restoration and sustainable farming will benefit biodiversity, flora, and fauna. Improving ecological connectivity, recovery and resilience of multiple ecosystem services, removing stressors to the ecosystem and providing shade during extreme weather contribute to adaptation to climate change, enhances ecosystem health and services, restores biodiversity and prevents declines in species and habitats in the longer term. Additionally, general improvements in soil and blue carbon habitats, knowledge and action, as per the soil-health and blue carbon subobjectives, indirectly improve biodiversity and various habitats it supports.

5.21 The water environment will be further supported through riparian planting along rivers which improves the resilience of watercourses and the species within them to increased water temperatures and helps filter pollutants which may enter the watercourse through surface water runoff. SEPA evidence gathering may also provide details on opportunities to improve the water environment for freshwater and marine species.

5.22 Although some benefits will be realised in the short term, timescales for achieving funding, plan and policy implementation and vegetation maturity will mean greater benefits in the longer term.

Water

5.23 Mostly positive effects are expected for the five objectives with regards to water for the Nature Connects outcome.

5.24 All the actions under the 'nature-based solutions', ‘Nature Networks’, 'Marine Ecosystems and the Blue Economy' and 'Natural Carbon Stores and Sinks' subobjectives contribute significantly to water quality and flood risk management. Improving flood resilience, coastal change, and promoting nature-based solutions, including Green and Blue Infrastructure (GBI) delivery, aid in managing flood risk over the medium to long term. Naturally functioning coastal landscapes, such as wetlands and sand dunes, act as natural flood defences, reducing coastal flood risk, with benefits more pronounced in the long term due to habitat restoration timescales. Additionally, GBI and riparian planting help manage flood risk by slowing surface water runoff, supporting watercourses' resilience to climate change, and preventing pollution. Additionally, peatland, woodland, marine restoration and agricultural habitat restoration act as a natural flood management which will prevent erosion and sediment runoff, improving water quality, positively impacting population health, and fostering biodiversity water quality, reducing run off, increasing flood attenuation and habitat enhancement. Furthermore, research and actions to control marine INNS are likely to improve water quality and manage flood risk by restoring native habitats and biodiversity, and reducing ecological stressors, and recovering ecosystem services. Policy and funding timescales for habitat restoration may lead to greater benefits in the longer term.

5.25 All of the actions make a positive contribution to water. The requirement for new and enhanced green/blue infrastructure alongside transport infrastructure will have a positive effect on the water environment both in terms of water quality and in managing flood risk. Specifically, information gathered by SEPA

could help planning authorities understand the implications and opportunities for areas such as future flood risk, coastal change and the water environment helping to deliver flood prevention and water management. This could help to manage flood risk within the medium to long term by reducing and slowing surface water runoff. In addition, the preparation of open space strategies will incorporate nature networks which could improve the quality of the water environment as a habitat for aquatic animals.

Air

5.26 Under ‘Nature Connects’ future actions for ‘Blue-Green Infrastructure investment’, ‘Landscape Scale Interventions’ and ‘Soil-Health’ are expected to have minor positive effects for air. Minor positive effects are also identified for ‘Nature Networks’, the ‘Development Planning’ objective, under ‘Open Space Strategies’ and future actions for ‘New Transport Infrastructure’, as well as all actions under ‘Marine Ecosystems and the Blue Economy’ and ‘Natural Carbon Stores and Sinks’ objectives for this outcome.

5.27 Increasing open space and GBI, particularly tree cover, within urban areas or at a landscape-scale will help improve air quality by filtering air pollutants. Higher concentrations of pollutants are found closest to their source. For example, transport derived air pollution is found most concentrated along roads. The presence of GBI along these roads can help act as a barrier between pedestrians and prevent the dispersal of air pollution and reducing localised exposure. Additionally, recovering and protecting multiple ecosystem services through nature network implementation, marine plans, marine protection areas (MPAs), restoration woodland, peatland and marine inshore habitats and implementing sustainable and regenerative farming practices will increase the resilience of carbon stores and vegetation, which will increase carbon assimilation, further improving air quality. This could have subsequent benefits for population and human health. These benefits will increase over time as plans and frameworks are implemented, and the vegetation becomes more mature.

Soil

5.28 Mostly positive effects are expected for the five objectives with regards to soil for the nature connects outcome.

5.29 The preparation of open space strategies and increasing delivery of GBI may further benefit soils by increasing rates of water absorption, reducing soil erosion, and improving soil fertility. In relation to landscape-scale interventions, increased knowledge surrounding soils may lead to a more sustainable use of agricultural land at a larger scale. In addition, the gathering of information by SEPA could help protect soil functionality and support developing vacant and derelict land if the information gathered is used to underpin spatial strategies within Local Development Plans. The development of vacant and derelict land could result in less greenfield land take up. Research and removal of invasive non-native plant species is likely to have a minor positive effect for soil health, as the recovery of native flora and fauna is likely to restore soil chemistry and ecosystem function, improving soil quality. Furthermore, improvements in knowledge and action for soils through the 'Soil-Health' subobjective is expected to have significant positive effects as this will help sustain soils which are healthy and rich in nutrients, support a diverse range of flora and fauna, and are more resilient to climate change impacts.

5.30 Maximising the restoration of peatland will have significant benefits to soil quality, as these are an important carbon store which is at risk. Therefore, significant positive effects are expected for the 'peatland' and 'nature networks' subobjectives. improving woodland creation and management, restoring habitats through nature networks, enhancing agricultural soils through sustainable and regenerative agriculture and coastal habitat protection and restoration will help encourage soils which are healthy and rich in nutrients, support a diverse range of flora and fauna, and are more resilient to any effects of climate change (e.g., soil compaction, drought, flooding, erosion). Improvements in soils may have subsequent benefits for water and climate change by reducing surface water flooding. Although some benefits will be realised in the short term, there will be greater benefits as habitats are restored and vegetation matures.

5.31 Negligible effects are expected for ‘vector borne disease’, future ‘freshwater habitats’ and ‘new transport infrastructure’. No actions are identified for current ‘Soil-Health’, ‘new transport infrastructure’ and future ‘Agricultural Soils’.

Landscape and geodiversity

5.32 The majority of the objectives within the Nature Connects outcome are expected to have minor positive effects in relation to the landscape and geodiversity SEA objective, with no significant effects identified.

5.33 Actions outlined within the objectives ‘Nature based solutions’, ‘Development planning’, ‘Marine Ecosystems and the Blue Economy’ and ‘Natural Carbon Stores and Sinks’ support the enhancement of nature and/or green and blue infrastructure, for example through woodland planting, or soil and peatland restoration. Such actions contribute to supporting geology and the landscape character and how it is perceived. ‘Marine Ecosystems and the Blue Economy’ in particular supports the restoration and enhancement of blue spaces and improvements in coastal restoration, and associated natural features.

5.34 In addition, actions outlined in the objectives of ‘Nature based solutions’ and ‘Nature Networks’ support general improvements in knowledge gathering and dissemination. The former objective focuses on soil which will help directly support geology by encouraging the restoration of peatland soils. Knowledge and action for INNS removal, which will help support geology and landscape by encouraging the restoration of native habitats and biodiversity.

Cultural heritage and historic environment

5.35 The majority of the objectives within the Nature Connects outcome are expected to have minor positive effects, with no significant effects identified.

However, a number of the sub objectives within the objectives of ‘Nature based solutions’, ‘development planning’ and ‘Marine Ecosystems and the Blue Economy’ are expected to have mixed minor effects.

Positive effects identified are due in part to actions outlined in the objectives of ‘Nature based solutions’ and ‘Marine Ecosystems and the Blue Economy’ which include those which increase resilience to flooding and reduce flood risk and will help protect heritage assets from flooding and coastal erosion. In addition, actions outlined within all five objectives support the enhancement of nature and/or green and blue infrastructure which may have positive effects on the historic environment by improving the setting of heritage assets if undertaken appropriately.

5.36 The mixed effects identified are due to actions outlined in both the of ‘Nature based solutions’ and ‘Marine Ecosystems and the Blue Economy’ promoting naturally functional coastal landforms, such as through the coastal change adaptation plan guidance, which may mean that over time heritage assets near the coast may be lost to erosion. In addition, both objectives outline landscape-scale interventions focussed on creating new economic opportunities such as nature-based solutions, natural capital investment and maintenance, green tourism, sustainable and regenerative food production, and wood products which may create activities which have an adverse effects on the historic environment or the setting of heritage assets (e.g., forestry felling, or agriculture). Furthermore, the objective of ‘development planning’ outlines actions for enhancements to green/blue infrastructure which may include woodland/tree planting which can impact directly on known and unknown archaeological resources, and on the setting and views to cultural heritage features. However, as these enhancements may also deliver climate mitigation effects which benefit cultural heritage resources, these effects are likely to be mixed.

Material assets

5.37 The majority of the objectives within the Nature Connects outcome are expected to have minor positive effects. One significant positive effect is expected in relation to current actions of the ‘agricultural soils’ subobjective in the ‘Natural Carbon Stores and Sinks’ objective.

5.38 All five objectives include actions which will provide a wide range of ecosystem services including reducing surface water flooding, and improving soil and water quality. In addition, the majority of the objectives include actions which may increase economic opportunities, including for nature-based solutions, natural capital investment and maintenance and green tourism, and food and wood production. The objectives of ‘Nature based solutions’, ‘Marine Ecosystems and the Blue Economy’ and ‘Natural Carbon Stores and Sinks’ all include actions which improve the collection and/or dissemination of knowledge such as that surrounding salmon monitoring, soils, peatlands, blue carbon habitats and woodlands condition and creation. This will have a variety of positive outcomes for material assets, for example aiding in improving flood resilience and provide ecosystem services.

5.39 The ‘agricultural soils’ subobjective in the ‘Natural Carbon Stores and Sinks’ supports improved soil quality sequestration and storage of carbon in agricultural soils, thus enhancing and protecting this natural resource.

Population and human health

5.40 The majority of the subobjectives are expected to have positive effects in relation to population and human health for this outcome.

5.41 The landscape scale interventions, peatland restoration, woodland creation and management, management of Scotland’s blue carbon habitats, sustainable farming practices, Nature network implementation and INNS removal will in the longer term have positive effects for population and human health through

support for developing skills and knowledge for land based, agriculture, and aquaculture sectors. This will indirectly also support the viability of rural communities, particularly those with higher levels of employment in the aquiculture and agricultural sector. In addition, investment in coastal climate change adaptation, peatland and woodland restoration, sustainable farming and urban GBI may reduce the effects of climate change on population by minimising flood risk and using natural solutions to cooling and improving air quality. Information gathered by SEPA could help to ensure that vacant and derelict land is brought back into positive use for people and communities. An increase in blue and green spaces could increase visual amenity, mental and physical health, and improve quality of life. Additionally, reducing the risk of 'Vector borne disease' will have a positive effect on population and human health through direct benefits to people who may be exposed to vector borne disease and from the impacts of vector borne disease on key economic sectors, and the indirect potential mental health impacts of this.

5.42 The timescale of the effects identified is likely to be in the medium to longer term. All of the additional actions will take time in terms of planning, delivery and project pipeline.

Outcome 2: Communities

5.43 Ongoing actions through 'Place-based collaboration', involve local authorities collaborating on climate adaptation. Future actions include a climate delivery framework, wider partnership working and collaboration on climate adaptation and health benefits, facilitation of regional adaptation partnerships, continued implementation of the Place Principle, and support for development of Regional Marine Plans.

5.44 Ongoing actions under the 'Community and individual support' objective include facilitating a national network of Climate Action Hubs, a community adaptation learning programme and to deliver the current National Islands Plan. Future actions include completing the review of the National Islands Plan, leading a Health Impact Assessment on the draft Adaptation Plan, development

of investment strategies for adaptation and resilience related finance, to deliver the Carbon Neutral Islands project and work with community groups to enhance marine protection.

5.45 The ‘Preparation and response (C3)’ objective involves the Scottish Government guidance on Building Resilient Communities, and the three subobjectives ‘Resilience (general)’, ‘Resilience (Flooding)’ and ‘Resilience (wildfires)’

5.46 ‘Resilience (general)’ include ongoing actions surrounding the ready.scot website and strengthened community resilience of climate change risks. There is a new action for Public Health Scotland to develop an Adverse Weather Health Protection Response Plan. As set out in ‘Resilience (Flooding)’ the SG is developing the first National Flood Resilience Strategy for Scotland. The SG will invest in flood forecasting and warning services, continue to develop policies around property flood resilience, ensure affordable flood insurance, and continue to support the Scottish Flood Forum. Ongoing actions for ‘Resilience (wildfires)’ include taking action to reduce wildfire risk and providing improved information to protect properties from wildfires. Future actions include providing an effective response to wildfire incidents through education, training and review of the Muirburn code, addressing fire risk in forestry plantations, reviewing the Scottish Outdoor Access Code in relation to ignition sources and develop partnership working with the land management sector.

5.47 The ‘New and existing Buildings (C4)’ objective covers ‘New buildings’ and ‘Existing and traditional buildings’.

5.48 Current actions as set out through ‘New Buildings’ include measures to address overheating in new homes, provide revised guidance in Building Standards Technical Handbooks and NPF4 to support climate change adaptation. Future actions involve a greater understanding of climate data to inform future building specifications and building regulations standards. Under ‘Existing and traditional buildings’ there is current requirement of NPF4 to retrofit measures to existing developments that reduce emissions or support adaptation to climate change**.** Additional current and future measures under this

subobjective surround Scottish Government's Green Public Sector Estate Decarbonisation Scheme, building household flood resilience, and follow the Living with Flooding action plan.

5.49 The 'historic environment' objective includes the 'historic environment' and 'culture' subobjectives.

5.50 Current actions set out in 'Historic environment' include Our Past, Our Future (OPOF), updating knowledge and experience, promoting Historic Environment Policy for Scotland (HEPS), SCAPE (Scotland's Coastal Archaeology and the Problem of Erosion), HES' Grants Framework's Grant Priority 4 and continuing to implement current Climate Action plan. Future actions are set out through OPOF, developing a 'Your Historic Place' lens, rolling out the Climate Vulnerability Index to all Scottish World Heritage Sites, publishing a Historic Environment Skills Investment Plan, and updating the HES Climate Action Plan. Through current 'Culture' there is ongoing commitment through actions surrounding the forthcoming Culture Strategy Action Plan Refresh. Other current actions include the National Library of Scotland 2023 Climate Action Plan, the National Galleries of Scotland Environmental Sustainability Report, the National Museums Scotland Climate Adaptation Plan and Creative Scotland to include an Environmental Sustainability Funding Criteria. Future actions for 'Culture' include a Culture Strategy Action Plan Refresh, Creative Scotland to continue to develop adaptation capabilities include climate risk, collect Environmental Sustainability and report annually on the progress of our Climate Emergency and Sustainability Plan. Museums Galleries Scotland will build resilience across the sector through development of a climate network to facilitate sharing of best practice, resources and expertise.

Assessment:

Climate change mitigation

5.51 Overall, mainly positive effects are expected in relation to climate change mitigation across all five objectives in the Communities outcome.

5.52 Minor positive effects for climate mitigation are expected in relation to the 'historic environment' objective for both current and future actions. A number of actions will directly result in the reduction of carbon emissions, for example actions supporting energy efficiency improvements such as the Our Past, Our Future strategy. Climate change mitigation is also supported via multiple actions that focus on education and information collection, sharing and dissemination regarding climate change mitigation, for example the availability of guidance to help reduce emissions from historic buildings. The promotion of the work of the Scottish National Culture for Climate (SNaCC) group also aids in influencing society and culture around climate change mitigation.

5.53 Minor positive effects are identified in relation to the future actions outlined in the place based collaboration objective, the community and individual support objective, resilience (wildfires) subobjective and the existing and traditional buildings subobjective. This is due to actions which support the indirect reduction of emissions, such as education and information collection and dissemination regarding emission reduction. In particular, the stimulation of placed-based collaborations regarding climate change and raising community awareness of local climate change-related issues and opportunities, will both encourage local action and result in more well informed and sustainable decision-making. Resilience (wildfires) subobjective also includes education-based actions to mitigate wildfire risk, which also aids in emissions reduction. This is alongside other actions which serve this purpose such as a comprehensive review of the Muirburn Code. The existing and traditional buildings subobjective also promotes the adaptation and retrofitting of buildings

to reduce emissions. The timescale of these effects is likely to be in the medium to longer term, reflecting the largely indirect nature of these effects.

Climate change adaptation

5.54 Significant positive effects are expected in relation to climate change adaptation across all five objectives in the Communities outcome.

5.55 For the place based collaboration objective, both current and future actions primarily support strengthening place-based collaborations to coordinate effective climate adaptation, and enhanced partnership working, capacity building and finance for climate adaptation across the whole of Scotland. Climate change adaptation actions which have been shaped by both collaborative and place-based approaches will be more effective and sustainable. In addition, setting out a clearer collective understanding of partnership working roles will enhance the quality of collaborations.

5.56 Actions within the majority of objectives, such as community and individual support, preparation and response and new and existing buildings include those which improve the quality of information available and the way it is disseminated. These will provide people and organisations with knowledge and tools to aid in the implementation of climate change adaptation, including in relation to extreme events such as flooding and wildfires. This will likely lead to more effective and sustainable decisions being made, especially in tandem with actions outlined in the community and individual support objective as such a bottom-up local-centred approach will be more appropriate for local areas and their communities.

5.57 In the preparation and response and new and existing buildings objectives, this outcome also provides actions which will aid in adaptation to extreme events such as flooding and wildfires. This includes actions which support adapting development to mitigate climate change impacts, such as flood risk and overheating, increasing community resilience and resilience to wildfires through land management. The culture and historic environment objective also

contributes to protecting historical and cultural assets from climate change impacts by supporting their sustainable repair and maintenance, increasing historical building resilience to climate change threats.

5.58 The continuation of ongoing actions to support adaptation means that positive effects will be realised in the short term, with greater effects increasing over the medium to long term as additional actions are taken forward.

Biodiversity, flora and fauna

5.59 The objectives of Place Based Collaboration, Community and individual support and Culture and Historic Environment and the subobjective of Resilience (Wildfires) all have positive effects for both current and future actions in relation to biodiversity, flora and fauna. However minor negative effects are identified in relation to new and existing buildings.

5.60 Significant positive effects are identified for current and future actions outlined in the Resilience (Wildfires) subobjective, as it includes actions outlining more preventative measures which will result in the mitigation of wildfires in Scotland, and therefore protection of Biodiversity, flora and fauna. These actions are both education/information based such as training and information dissemination, as well as a comprehensive review of the Muirburn Code to ensure vegetation/fuel management is as effective as possible and strengthening assessment of wildfire risk. Education and information based actions will increase in effectiveness over the medium to longer term, as education and training reaches a greater number of people over time, and good practice is implemented.

5.61 The majority of the objectives with positive effects include actions that also support climate change adaptation and/or mitigation. Effective climate change adaptation and mitigation will include actions that result in indirect positive impacts on biodiversity, flora and fauna. For example, by fostering ecosystem resilience, habitat creation such as via rewilding and afforestation and mitigating the impact of INNS. In addition, future actions outlined in the resilience

(flooding) subobjective include working with nature to reduce flood impacts, which will impact positively on this objective. The positive effects from working with nature to manage flood impacts will take place in the medium to longer term, reflecting the time taken to establish these land management changes.

5.62 Traditional buildings can be important places for biodiversity, for example by providing places for nesting for animals such as birds and bats. The objective for Culture and Historic Environment includes actions to safeguard and enhance the climate resilience of heritage sites which will indirectly result in the protection of associated habitats. However minor negative effects are identified in relation to new and existing buildings actions regarding the existing and traditional buildings subobjective. This includes actions which support retrofit and adaptation of buildings to climate change, though do not take account of potential harm of these actions to biodiversity associated with these buildings.

5.63 Mitigation and enhancement: new buildings designed for a future climate should provide alternatives to protect and/or enhance biodiversity.

Water

5.64 Overall, mainly positive effects are expected in relation to water across all five objectives in the Communities outcome.

5.65 Minor positive effects are identified in relation to both the current and future actions outlined in the place based collaboration, community and individual support objective and new and existing buildings objectives and the resilience (flooding) and the historic environment subobjectives.

5.66 The actions of the objectives generally support climate adaptation, and some also support climate change mitigation. Effective climate change adaptation and mitigation will result in indirect positive impacts on Scotland’s water environment. For example, by mitigating the negative impacts of

temperature change on the water environment, in the medium-long term. Effective climate change adaptation and mitigation will also result in reducing the likelihood of flooding as well as improve resilience. In addition, both the new and existing buildings objective and resilience (flooding) subobjective include actions which directly support reducing flood risk to the built environment. The historic environment subobjective includes actions which support reducing water consumption, and water efficiency and reuse. The actions also particularly support the marine environment and coastal communities, which are at particular risk from climate change.

5.67 Improvements in flood information will support community resilience in the short, through to long term. The timescale of effects relating to actions such as Regional Marine Plans, National Islands Plan review will be in the medium to longer term, reflecting the timescale for preparation and implementation.

Air

5.68 Over half of the objectives do not directly affect Scotland's air quality, and thus are considered to have negligible effects regarding the air objective. The rest of the objectives in the Communities outcome are assessed as having minor positive effects in relation to air. This includes the Place Based Collaboration and Community and individual support objectives and the Resilience (Wildfires) and Historic Environment subobjectives.

5.69 The actions of the objectives generally support climate adaptation, and some include actions that also support climate change mitigation. Effective climate change adaptation and mitigation will result in indirect and direct positive impacts on Scotland's air quality in the medium-long term. For example, climate change mitigation measures, as well as health-centred actions which promote sustainable travel, mitigate greenhouse gas emissions, thereby improving air quality. Climate change adaptation measures also likely include measures which improve air quality, are the creation of green spaces and green infrastructure, which will encourage a modal shift to more sustainable forms of transport and reduce emissions. The resilience (wildfires) subobjective will

reduce wildfires and associated emissions thereby improving air quality. In addition, a number of actions outlined in the historic buildings subobjective support the implementation of low carbon solutions and increased energy efficiency of buildings, which will aid in reducing emissions. The minor positive effects on air quality are likely to take place in the medium to longer term, reflecting the timescales of actions bringing air quality benefits.

Soil

5.70 For the Communities outcome, significant positive effects are identified in relation to both current and future actions for the resilience (wildfires) objective, reflecting the future anticipated increase in incidence and severity of wildfires, and vulnerability of peat soils. Minor positive effects are identified in relation to both the current and future actions of the Place Based Collaboration and Community and individual support objectives and resilience (flooding) subobjective.

5.71 Actions in the wildfires subobjective aid in preventing wildfires. Wildfires can negatively affect soil, for example via decreasing the total nutrient pool through processes of oxidation, volatilization, ash transport, leaching, and erosion and thus the actions in this subobjective will serve to protect Scotland's soils. Flooding also has the potential to damage soils. The actions outlined in the flooding subobjective include those which involve and improve the dissemination of flood-risk related information will allow people to make informed decisions in their area, thus reducing flood risk, thereby potentially protecting soils in the medium to longer term.

5.72 The actions outlined in relation to both the Place Based Collaboration and Community and individual support objectives generally support climate adaptation, and some actions also support climate change mitigation. Effective climate change adaptation and mitigation will result in indirect positive impacts on Scotland's soil environment in the medium to longer term. They also promote local and community action which is likely to be more sustainable and area appropriate as these are locally led, thereby likely reducing potential negative

impacts on soils. Actions to address coastal erosion will provide additional protection to coastal soils.

Landscape and geodiversity

5.73 For the Communities outcome, significant positive effects are identified in relation to both current and future actions for the resilience (wildfires) subobjective. Minor positive effects are identified in relation to the Place Based Collaboration, Community and individual support and culture and historic environment objectives. There are also mixed minor positive and negative effects identified in relation to both current and future actions outlined in the new and existing buildings objective.

5.74 The Wildfires subobjective includes actions outlining preventative measures, thereby reducing the risk of potential harm to landscape character in the long term, in light of anticipated future increasing trends in wildfires in Scotland.

5.75 The actions outlined in relation to both the Place Based Collaboration and Community and individual support objectives generally support climate adaptation, and some include actions that also support climate change mitigation. Climate change mitigation and adaptation activities can result in indirect positive and negative effects on landscape and geodiversity.

5.76 Effective climate change adaptation and mitigation will result in indirect positive impacts on Scotland's landscape. Climate change mitigation and adaptation measures will likely be beneficial to Scotland's landscapes and townscapes as they will likely result in the protection and enhancement of the character and quality of Scotland's landscapes, townscapes and seascapes from the adverse effects of climate change, including improving the resilience of the landscape from the adverse effects of climate change and the creation of green infrastructure. They also promote local and community action which is likely to be more sustainable and area appropriate as these are locally led, thereby likely reducing potential negative impacts on landscapes. However,

some negative effects may occur. In addition, the culture and historic environment objective will result in positive effects regarding landscapes as actions regarding the maintenance of buildings and sites, and nature-based adaption solutions all contribute to supporting geology and the landscape/ townscape character and how it is perceived.

5.77 The new and existing buildings objective will aid in the mitigation of negative effects of climate change on Scotland's landscapes and townscapes, with the new buildings subobjective also including actions which will take into account climate risks and result in the siting of buildings in less vulnerable areas. The adaptation of both new and existing buildings to climate change may negatively affect the quality of landscapes and townscapes, over a longer time period as adaptation changes are implemented. The actions, particularly regarding new buildings, do not address this potential for harm to Scotland's landscapes. Therefore, mixed minor effects are expected.

Cultural heritage and historic environment

5.78 For the Communities outcome, significant positive effects are identified in relation to both current and future actions for the culture and historic environment objective. Minor positive effects are identified in relation to current and future actions of the Place Based Collaboration and Community objectives and resilience (wildfires) subobjective. There are also mixed minor positive and negative effects identified in relation to both current and future actions outlined in the new and existing buildings objective.

5.79 Significant positive effects are identified for the current and future actions for the culture and historic environment objective as they directly support the resilience of Scotland's historic environment to climate change and related hazards such as flooding. This is particularly via education-based actions, strategies and partnership working.

5.80 The actions outlined in relation to both the Place Based Collaboration and Community and individual support objectives generally support climate

adaptation, and some actions that also support climate change mitigation. Climate change mitigation and adaptation measures may be beneficial to Scotland's heritage assets and their setting as they may result in the protection and enhancement of the character and quality of Scotland's historic environment from the adverse effects of climate change, including improving the resilience of the historic environment from the adverse effects of climate change. Increased partnership working and place based collaboration on climate change mitigation and effective climate change adaptation would likely result in increased consideration of impacts on the historic environment and enhanced resilience of Scotland's historic environment to the effects of climate change. They also promote local and community action which is likely to be more sustainable and area appropriate as these are locally led, thereby likely reducing potential negative impacts on the historic environment.

5.81 In addition, the Wildfires subobjective includes actions outlining more preventative measures which will result in the mitigation of wildfires in Scotland, and therefore likely the protection of certain historic assets and their setting.

5.82 The new and existing buildings objective will aid in the mitigation of negative effects of climate change on the historic environment by supporting the protection and increased resilience of heritage assets from climate change impacts. However, the adaptation of both new and existing buildings to climate change may negatively affect the quality and setting of Scotland's historic environment, and are likely to take place from the short to longer term, as adaptation is implemented. The actions, particularly regarding new buildings, do not address this potential for harm to Scotland's historic environment. Though the actions regarding existing and traditional buildings do support the undertaking of research and public education regarding appropriate adaptation and minimising maladaptation. Therefore, mixed minor effects are expected.

Material assets

5.83 The current and future actions of the objectives of preparation and response and new and existing buildings are expected to have significant

positive effects in relation to material assets over the short to longer term, reflecting the extent of current and future actions. Minor positive effects are identified for the current and future actions of the objectives of place based collaboration, community and individual support and culture and historic environment.

5.84 The actions outlined in the preparation and response objective support adaptation to the effects of climate change such as extreme weather, flooding and wildfires. Many of these actions will result in the protection and/or resilience of material assets such as buildings from such effects. In addition, both this objective and the new and existing buildings objective include actions involving the continued and improved collection and dissemination of information and education, which will allow people and organisations to make well informed decisions, such as those regarding flood risk, and increase resilience, thereby mitigating risk to material assets. In addition, the new and existing buildings objective supports building design taking into account and enabling adaptation to risks, and also encourages increasing the energy efficiency of existing and traditional buildings.

Population and human health

5.85 The current and future actions of the objectives of place based collaboration, community and individual support and preparation and response are expected to have significant positive effects in relation to population and human health. The current and future actions of the objectives of new and existing buildings and culture and historic environment are expected to have minor positive effects.

5.86 The majority of actions within this outcome will promote locally led climate change adaptation and mitigation action. Climate change mitigation and adaptation measures will likely be beneficial to the health of Scotland’s population, for example via measures such as creation of green space and modal shift to sustainable transport, which will result in increased accessibility and healthy and active lifestyles. In addition, measures to mitigate climate

change and increase resilience will also mitigate its negative impacts on health and services and facilities.

5.87 In particular, the objectives of place based collaboration and community and individual support take into account the needs of local people and communities and facilitate locally led and community-based actions which will result in more beneficial, effective and sustainable climate action being taken, increasing positive effects to communities, but also supporting participation and empowerment. Place based collaboration also includes actions which promote healthy and active lifestyles which support improved wellbeing. In addition, all of the actions within the preparation and response objective support adaptation to the effects of climate change such as extreme weather, flooding and wildfires, thereby mitigating associated negative physical and mental health effects. In addition, the Wildfires subobjective includes actions outlining more preventative measures which will result in the mitigation of wildfires in Scotland, and therefore protection of assets beneficial to health and wellbeing such as forests and recreational space and the mitigation of harm to the quality of the living environment of people and communities. These positive effects will take place over the short to longer term, reflecting the short term effects from community action supporting resilience and empowerment, through to the longer term effects from actions which take longer to implement, such as changes in sustainable travel.

Outcome 3: Public Services and Infrastructure (PS)

5.88 As set out in the ‘Public Service Providers (PS1)’ objective, Scottish Government will work across the public sector to develop and publish updated statutory guidance on public bodies climate change duties. All relevant public bodies will continue to report annually on PBCCD. The SG-funded Adaptation Scotland programme, via its public sector leadership cluster, will develop adaptability measures.

5.89 The ‘Accessing Public Services’ objective includes ‘Essential services and critical infrastructure in Scotland’, ‘NHS and social care’, and ‘Education’.

5.90 Current actions set out through ‘Essential services and critical infrastructure in Scotland’ involve the continuation of the SG to cooperate with Regional and Local Resilient Partnerships, the Responder Community, Industry, the UK Government and other Devolved Nations, implement Keeping Scotland Running (KSR) and support the resilience of all public services via the actions set out in PS1. Ongoing actions set out in ‘NHS and Social care’ include each health board to complete CCRA, and NHS Services Scotland to implement its web-based Geographic Information System (GIS) Climate Change hazard and vulnerability Mapping Tool. In the future, health boards will prepare and implement climate change adaptation plans, work towards the requirements of ISO 14090: Adaptation to climate change, prioritise passive cooling measures, monitor overheating, develop and manage green infrastructure, raise awareness of climate risks and actions, incorporate water saving measures and flood risk assessments. Future measures include NHS National Services Scotland to increase engagement, sharing data on emergency procedures within resilience planning, assess NHS Boards’ status against the requirements of ISO 14090: Adaptation to Climate Change. Additionally, Public Health Scotland will work with the SG and COSLA to understand how they can support the social care sector to respond to the climate emergency. The ‘Education’ subobjective includes the Learning Estate Investment Programme (LEIP), Scottish Funding Council (SFC) and their net zero framework and approving projects by Local Authority Flood Officers to continue to build the resilience of school estates. Future projects include increasing the adaptation of school grounds, engaging with stakeholders, improving access to outdoor spaces and the Climate Ready School Grounds project.

Through the ‘Power Assets and the Energy System (PS3)’ objective, the SG will engage with the UK Government through their Review of Electricity Market Arrangements, maximise renewable assets, as well as update the Energy Strategy and Just Transition Plan, and roll out the Persons at Risk Distribution (PARD) system. To assist operators of major accident hazard sites to adapt to climate change, SEPA has several future and current actions planned.

5.91 The ‘Transport system (PS4)’ sets out actions that are currently and will be taken within the ‘Trunk Roads’, ‘Rail Network’, ‘Aviation Network’ ‘Maritime Network’ and ‘Canals’.

5.92 Transport Scotland will embed adaptation and resilience across the Transport Scotland functions through its Transport Scotland 2023 Approach to Climate Change Adaptation and Resilience. The ‘Trunk Road’ future actions involve a Trunk Roads Adaptation Plan, building network resilience, a Biodiversity Strategy, managing disruption risk and regularly review and updating high wind, flood and landslide management plans. ‘Rail network’ current actions include the joint Climate Ready Plan. Detailed delivery plans underpinning these outcomes will be published in 2024. Other future actions include supporting policy development that improves rail network resilience. Network Rail will also continue to deliver actions associated with recommendations made by the Weather Risk Taskforce. Current ‘Aviation network’ actions include HIAL’s Climate Change Adaptation Report and climate vulnerability and risk assessment. The identified risks were incorporated into HIAL’s existing risk management, and a range of actions are planned to monitor flood, coastal erosion and high temperature risk. Future ‘Maritime network’ actions include the engagement with ferry operators and promotion of awareness of climate science and collaboration on adaptation and resilience opportunities. Current and planning actions for ‘Canals’ are set through the Scottish Canals’ Corporate Plan 2023-28.

5.93 The ‘Water, sewerage and drainage’ objective includes the subobjectives; ‘water’, ‘flooding’ and ‘Drought/water scarcity’.

5.94 As set out in ‘Water’, the Scottish Government is currently considering responses to the water, wastewater and drainage consultation and will continue to actively manage its water resources. Additionally, Scottish Water will use its Climate Change Adaptation Risk Assessment to support its strategic planning and investment to secure future service resilience. Through ‘flooding’ the Local Flood Risk Management Plans covering 2022 – 2028 have been updated and SEPA will publish a new National Flood Risk Assessment in 2024, as well as work closely with other organisations responsible for managing flood risk,

provide flood risk advice to land use planning in Scotland, raise awareness at a national level, forecast for flooding and operate Floodline in Scotland. Furthermore, the current ‘Scotland’s National Water Scarcity Plan’ is due to be updated to reflect the water usage framework to be implemented by SEPA.

Assessment

Climate change mitigation

5.95 Overall, mainly negligible effects are expected in relation to climate change mitigation across all five objectives in the Public Services and Infrastructure outcome. Only two of the objectives (Power Assets and the Energy System and Transport System) are expected to have positive effects. Positive effects are expected to be significant in relation to the Transport Systems objective.

5.96 One of the actions under the Power assets and the energy system supports progressing towards net zero through engaging with the UK Government through their review of Electricity Market Arrangements. In relation to the Transport Systems objective, Scottish Canals will implement a net zero action plan, aiming to reduce direct carbon emissions and define scope 3 emissions, as well as embrace new research and partnerships to support renewable energy production, reducing emissions and carbon footprint. Additionally, the 2023 Approach to Climate Change Adaptation and Resilience sets out aims to decarbonise transport, reducing emissions from the transport sector. Actions under both of these objectives will support reductions in greenhouse gas emissions and mitigating the effects of climate change. Effects are expected over the medium to long term.

Climate change adaptation

5.97 Overall, mainly positive effects are expected in relation to climate change adaptation across the objectives in the Public Services and Infrastructure outcome. The positive effects are expected to be significant for the Public Service Providers, Accessing Public Services and Transport Systems objectives. Only one of the objectives (Power Assets and the Energy System) is expected to have negligible effect.

5.98 The actions under public service providers include supporting the Public Bodies Climate Change Duties and continuing to support the Adaptation Scotland Programme. Supporting public sector organisations will help to enhance climate change adaptation across local authorities and Scotland. Publishing updated statutory guidance on public bodies climate change duties will provide further guidance and information to help the public sector adapt. Supporting advanced adaptation capabilities will further enhance the ability of the public sector to adapt to climate change.

5.99 The actions under the Accessing Public Services objective will support programs that will ensure climate resilience and adaptation of essential services and critical infrastructure in Scotland and NHS and social care. Additionally, building the resilience of school estates will further enhance adaptation measures by creating climate resilient infrastructure. This will reduce the risk of damage to buildings and infrastructure from climate change.

5.100 Actions relating to Transport Scotland, Rail Network, Aviation Network, future Maritime Network and Canals under the Transport System objective will increase the resilience of transport infrastructure to climate hazards. This increased resilience will ensure operating companies are prepared for any future effects of climate change. Actions relating to water, flooding and drought / water security under the Water, Sewerage and Drainage objective are likely to focus on climate change adaptation, including through the sustainable management of water resources and collection and dissemination of information to enhance decision making and reduce risk posed by climate change impacts.

5.101 These effects are expected to be in the short to long term as some actions rely on new guidance or require plans to be put in place.

Biodiversity, flora and fauna

5.102 Overall, some positive effects are expected in relation to biodiversity, flora and fauna across the objectives in the Public Services and Infrastructure outcome. Only two of the objectives (Public Service Providers and Power Assets and the Energy System) are expected to have negligible effects.

5.103 Minor positive effects are expected for actions regarding essential services and critical infrastructure in Scotland and NHS and social care and all actions outlined within education under Accessing Public Services objective. Actions to develop and manage green spaces and other green infrastructure such as green roofs could provide spaces for wildlife and increase vegetation cover which could indirectly benefit biodiversity. In relation to education, the LEIP and the future climate ready school groups project, could result in the creation and adaptation of green spaces creating a richer and more resilient biodiversity. Actions under the Transport System objective regarding Transport Scotland, Scottish Canals and plans for future trunk roads will support habitat creation and preservation. Additionally, trunk roads will develop a biodiversity strategy by 2025, which is likely to increase biodiversity, flora and fauna through these actions. Through the Scottish Canals Corporate Plan 2023-28, new research, technology, stewardship action and monitoring and improving the resilience of canal assets will address biodiversity loss and maximise the biodiversity value of the canal network.

5.104 The actions within the Water, Sewerage and Drainage objective outlines the ongoing water, wastewater and drainage public consultation. This will aid in the mitigation of water-related issues which could have an impact on Scotland's marine environment, through exploring how to adapt Scotland's water, sewerage and drainage services in the face of climate change. In addition, considering networking small blue-green infrastructure into larger networks could also support habitat creation. Furthermore, Scotland's National Water

Scarcity Plan aids in mitigating the impacts of prolonged dry weather on the environment via the sustainable management of water resources. This will likely be enhanced by the plans planned update which will take into account lessons learned and the water usage framework to be implemented by SEPA.

5.105 The effects are likely to be greater in the longer term reflecting the timescales of implementing these plans.

Water

5.106 Overall, some positive effects are expected in relation to water across all the objectives in the Public Services and Infrastructure outcome. Effects are expected to be significant for the Water, Sewerage and Drainage objective. Power Assets and the Energy System and the Public Service Providers objective are expected to have negligible effects.

5.107 Actions relating to NHS and Social Care and education could directly mitigate issues of flood risk and water quality and quantity, such as through creating the creation of greenspace and raingardens and building the resilience of school estates to help manage periods of drought and flooding. As well as this, actions under the NHS and Social Care require the assessment of flood risk for all sites and the incorporation of water saving measures. Overall, these actions will have a positive effect on minimising the impacts of flood risk and lowering water use.

5.108 The Transport Scotland, Trunk Road and Rail Network and Canal actions under Transport System objective are expected to reduce water use through installing utility water metering, water saving flush and tap systems and maintenance. Improved rail drainage strategy and trunk road management through the regular review of flood management plans and building resilience, such as tree planting schemes to reduce surface water runoff during heavy rainfall events, will reduce flooding risk.

5.109 The ongoing water, wastewater and drainage public consultation through the Water Sewerage and Drainage objective explores options which will improve the quality and quantity of Scotland's water. The consultation also explores options to network small blue-green infrastructure into bigger networks, which will result in more effective management of surface water and drainage. Actions regarding flooding, such as those which involve the collection and dissemination of information regarding flooding, will result in more informed decisions which will direct new development away from areas at highest risk of flooding. This will help avoid inappropriate development in areas at risk of flooding. Scotland's National Water Scarcity Plan aims to sustainably manage water resources prior to and during periods of prolonged dry weather, thereby helping to preserve and enhance the quantity of Scotland's waterbodies and groundwater. These effects are expected in the medium to long term, reflecting the time to implement these measures.

Air

5.110 Overall, mainly negligible effects are expected in relation to air across all five objectives in the Public Services and Infrastructure outcome. Only two of the objectives (Accessing Public Services and Transport System) are expected to have minor positive effects.

5.111 The actions for health and social care and education, as well as future actions for education under the Accessing Public Services objective support improvements in air quality. Through the Learning Estate Investment Programme, the Scottish Government and Local authorities will continue to build the resilience of school estates which could improve air quality. However, the actions under Education are not clear in what measures will improve air quality. Developing and managing greenspace and green infrastructure such as roofs, at health and educational facilities will increase vegetation, improving the sequestration process and subsequently air quality by filtering air pollutants. Actions under the Transport objective are expected to result in the decarbonisation of transport and investment in renewable energy production while emissions from petrol and diesel vehicles are expected to reduce. This will

reduce the level of pollutants in the atmosphere, and therefore improve air quality.

5.112 These effects are expected in the short to long term.

Soil

5.113 Overall, mainly negligible effects are expected in relation to soil across all five objectives in the Public Services and Infrastructure outcome. Minor positive effects are identified in relation to actions relating to NHS and Social Care, Education, trunk roads and drought/water scarcity.

5.114 Improvements to managing and enhancements to greenspace through actions for education and NHS and social care under the Accessing Public Services objective are likely to have positive effects. Developing and managing greenspace could safeguard and enhance soil structure. Furthermore, measures that educational institutions will take to respond to the climate emergency is likely to preserve and improve the resilience of soils. Improvements in soils may have subsequent benefits on for water and climate change by reducing surface water flooding. Landslide management plans which will be developed under the Transport System objective will contribute positively and help manage the impacts on soils from the development of trunk roads. Scotland's National Water Scarcity Plan through the Water, Sewerage and Drainage objective will aid in mitigating the impacts of prolonged dry weather on the environment via the sustainable management of water resources. This will also result in benefits to Scotland's soils, as droughts can degrade soil quality, for example by impacting the soil's underlying organisms and microbial networks.

5.115 Although some benefits will be realised in the short term, there will be greater benefits in the long term as the impact of education and the implementation of plans takes place.

Landscape and geodiversity

5.116 Overall, some minor positive effects are expected in relation to landscape and geodiversity across all five objectives in the Public Services and Infrastructure outcome. Only two of the objectives (Public Service Providers and Power Assets and Energy systems) are expected to have negligible effects overall.

5.117 Townscape/landscape and geodiversity is likely to be indirectly safeguarded through actions that adapt health and educational infrastructure under the Accessing Public Services objective to improve resilience to future climate risks. These actions identify the likelihood and impact of future climate hazards and allow resilience planning to preserve important features of townscapes/landscapes, supporting geology and the landscape character and how it is perceived. The benefits are particularly significant for future actions to create and restore green spaces for health and social care, and for all actions relating to education due to the creation of richer landscapes.

5.118 The Transport Scotland, Trunk Road and Rail Network and Canal actions under the Transport System objective ensure that infrastructure development must take account of the impact on the environment and local landscape character. Additionally, actions to enhance the trunk road environment such as tree planting, and the future biodiversity strategy, alongside actions to safeguard and enhance Scottish Canals are likely to support landscape. The Water, Sewerage and Drainage objective outlining the ongoing water, wastewater and drainage public consultation and subsequent reflection of these findings in the final Adaptation Plan, may result in positive outcomes for Scotland’s landscapes. This is because it explores adapting water, sewerage and drainage services in the face of climate change, including options which would aid in the mitigation of the negative effects of climate change on the landscape. The actions outlined regarding flooding will also aid in protecting the landscape from the negative impacts of flooding. For example, a number of actions involve the collection and dissemination of information regarding flooding which will support organisations and individuals in protecting landscape and townscapes from the impacts of flooding.

5.119 These effects are expected in the medium to long term.

Cultural heritage and historic environment

5.120 Overall, mainly negligible effects are expected in relation to cultural heritage and historic environment across all five objectives in the Public Services and Infrastructure outcome. Only two of the objectives (Transport System and Water, Sewerage and Drainage) are expected to have minor positive effects.

5.121 The current canal actions under the Transport System objective will protect and enhance heritage assets through the corporate plan 2023-28. This will be done through monitoring, designing new and replacement infrastructure using traditional materials, and modelling and quantifying the physical and social impact on heritage structures, to build the resilience of assets. The actions outlined regarding flooding under the Water, Sewerage and Drainage objective will aid in protecting Scotland's historic environment from the negative impacts of flooding, the risk of which will increase over time due to climate change. For example, a number of actions involve the collection and dissemination of information regarding flooding which will support organisations and individuals in protecting historic assets and their settings from the impacts of flooding. These effects are likely to become greater in the long term as more information is collated.

Material assets

5.122 Overall, mainly positive effects are expected in relation to material assets across all five objectives in the Public Services and Infrastructure outcome. Positive effects are expected to be significant for the Accessing Public Services, Water, Sewerage and Drainage and Transport System objectives. Only one objective (Public Service Providers) is expected to have a negligible effect.

5.123 The actions under Essential Services and Critical Infrastructure in Scotland, NHS and Social Care and Education under the Accessing Public Services objective will support the resilience of healthcare facilities and educational establishments to climate change. This will improve and safeguard health and educational infrastructure resilience. Additionally, the enhancement of green spaces, investment into natural capital research and sustainable agriculture and aquaculture will enhance ecosystem services and economic opportunities for nature-based solutions, natural capital investment and maintenance, tourism, and food production.

5.124 The actions under Power assets and the Energy system objective will help enhance the resilience of the energy systems in Scotland. The actions also support reducing the use of fossil fuels for energy which could lower the extraction of finite natural resources. Increasing energy storage through updating the Energy Strategy and Just Transition Plan will further increase the resilience of Scotland's energy network.

5.125 Actions relating to Transport Scotland, Rail Network, Aviation Network, Maritime Network and Canals through the Transport System objective will increase awareness and improve the resilience of transport infrastructure.

5.126 The Water, Sewerage and Drainage objective may result in the increased efficiency of water usage, as an asset. In particular, the water, wastewater and drainage public consultation explores the options of a legal requirement to plan for water resources. The actions outlined in relation to flooding will help to mitigate the impacts of flooding. For example, a number of actions involve the collection and dissemination of information regarding flooding which will support organisations and individuals to protect their material assets from the impacts of flooding.

5.127 These effects are likely to be greater in the long term, reflecting the time taken to implement the actions.

Population and human health

5.128 Overall, mainly positive effects are expected in relation to population and human health across all five objectives in the Public Services and Infrastructure outcome. Positive effects are expected to be significant for the Accessing Public Services, objective.

5.129 The actions relating to essential services and critical infrastructure in Scotland, NHS and social care and education under the Accessing Public Services objective are expected to have positive effects. The enhancement of health and educational infrastructure to make them resilient to the effects of climate change will help ensure that these services continue to be available even during extreme weather events. This will ensure that key services, such as healthcare, social care, education and public health services, remain available having a positive impact on health and wellbeing particularly for those within vulnerable communities.

5.130 Ensuring the resilience of the energy networks through the actions under Power assets and the Energy system will help ensure an adequate supply of energy to homes and businesses is delivered. In addition, progressing to net zero will encourage the use of low carbon and renewable energy instead of fossil fuels. The Nick Winser Review supports enhancements to grid infrastructure which will support decarbonising the economy and providing clean and affordable electricity to households. This could have a positive impact on reducing energy costs for households and businesses as fossil fuels can be impacted by changing market conditions and supply and demand that can raise energy costs. Rolling out the Persons at Risk Distribution (PARD) system across Scotland will help local authorities and the NHS to identify vulnerable individuals during an emergency, such as an extreme weather event. This will ensure that the people most in need are reached which could include vulnerable people, ensuring they have a continual supply of electricity to their homes.

5.131 All actions under the Transport System objective are expected to have positive effects. The actions will ensure there are no significant disruption to

services, improving the reliability of flight and sustainable transport options. Increased awareness of climate risk may also benefit people in their personal lives.

5.132 The Water, Sewerage and Drainage objective will likely have positive effects on the health of Scotland's population. The availability of good quality water is vital to human health and climate change. The consultation will help explore options which help mitigate impacts on water from climate change and improve drinking water quality. Also, the quality of recreational waters may improve, encouraging more people to live more active lifestyles. In addition, the consultation explores networking small blue-green infrastructure into larger networks, which will encourage healthier and more active lifestyles, as well as aid in the improvement of mental wellbeing. The actions under flooding will help in improving the health of Scotland's population by helping organisations and individuals to mitigate the negative impacts of flooding on people and communities. Local Flood Risk Management Plans will also increase the effectiveness of decisions made regarding mitigating flood risk, as they contain more place-specific information. Scotland's National Water Scarcity Plan will support the sustainable management of water resources aiding in the mitigation of impacts of prolonged periods of dry weather on people and communities.

5.133 These effects are likely to be in the long term as new infrastructure will be required.

Mitigation and enhancement

5.134 There are no actions within the Power Assets and the Energy System objective in relation to the use of renewable energy.

Outcome 4: Economy, Business and Industry (B)

The objective ‘increasing business awareness of climate risks (B1)’ involves subobjectives ‘increasing awareness of climate risk’, ‘Support and advice’, ‘Business and flooding’, ‘Business and coastal erosion’ and ‘Business and water scarcity’.

Ongoing actions set out in ‘increasing awareness of climate risk’ include a public engagement campaign through Ready Scotland. Future actions involve extending the reach of climate adaptation guidance through Find Business Support.gov.scot and establishing an annual assessment and expanding the ONS Business Insights and Conditions Survey of Scottish business awareness of climate-related risk. ‘Support and advice’ future actions involve using the Adaptation Scotland Programme and Scotland’s Enterprise Agencies, including Scottish Enterprise’s Net Zero Framework for Action, to support business resilience to climate-related risks. Future ‘Business and flooding’ actions include publishing Scotland’s first National Flood Resilience Strategy, a Flood and Incident Messaging Service (FIMMS), review of Potentially Vulnerable Areas and the Flood Risk Assessment Scotland (FRAS). Current ‘Business and flooding’ actions include embedding the Water Resilient Places Policy Framework recommendations into policies. Other current actions include SGs Ready Scotland communications and advice and continuing to invest in SEPA’s Scottish Flood Forecasting and warning services. Current and future actions for ‘Business and coastal erosion’ are set out in Coastal Change Adaptation Plans. Through ‘Business and water scarcity’ the Scottish Government will build on investment in Scotland’s water and sewerage services, review water industry policy, and continue to assess how water, sewerage and drainage services can adapt to the impacts of climate change.

The ‘Farming, fishing and forestry (B2)’ objective includes actions relating to ‘Advice, Skills and Funding’, ‘Agriculture Opportunities Research’, ‘Pests and Agriculture’, ‘Forestry Sector’ and ‘Fishing and aquaculture’ subobjectives.

Through ‘Advice, Skills and Funding’ the SG will continue to use the Forestry Grant Scheme and provide training, advice and guidance, as well as financial support for farmers and crofters to adapt to climate change. In the future, the SG will shift half of all agricultural funding to be conditional on delivering for climate and nature, including climate adaptation, as well as deliver a new, Agricultural Knowledge and Innovation System (AKIS) and facilitate peer to peer engagement on activities that support climate adaptation. Currently the ‘Agriculture Opportunities Research’ sets out the SG’s Rural and Environment Science and Analytical Service (RESAS), which invests in a ‘Strategic Research Programme’. In the future, the SG will continue to support the development of innovative solutions and research on agriculture and climate adaptation through RESAS. Current actions set out in ‘Pests and Agriculture’ include measures to prevent the introduction and spread of harmful organisms. Additionally, water scarcity is forecasted and managed through Scotland’s National Water Scarcity Plan and RESAS. In the future, Science and Advice for Scottish Agriculture (SASA), RESAS and the Plant Health Centre will continue to develop approaches to enhance Scotland’s capacity and capability to respond to crop and other plant health threats. The ‘Forestry Sector’ sets out the current Scotland's Forestry Strategy 2019–2029. Other current and future measures involve Scottish Forestry to work with partners to protect productivity in the commercial forest industry from the threat of increasing pests resulting from climate change, as well as incentivise and support the forestry industry to identify climate risks, opportunities and take adaptation action. Future actions set out in the ‘Fishing and aquaculture’ subobjective include a ClimateXChange research project on the risks and opportunities relating to climate change and commercial fisheries in Scotland. SG will continue to set fishing limits that are informed by scientific advice and work with stakeholders to deliver this.

5.135 The ‘Adaptation Innovation’ objective includes subobjectives; ‘Adaptation and Resilience Economy - Evidence + Innovation Support’, ‘CIVTECH’, ‘Innovation Centres’, ‘Innovative research’ and ‘Financial innovation’.

5.136 Future actions set out in the ‘Adaptation and Resilience Economy – Evidence + Innovation Support’ include the evidence base to improve understanding of the business opportunities arising from adaptation to climate risks, and the goods and services needed to support a more resilient economy.

The ‘CivTech’ subobjective involves the current CivTech programme and Innovate for Nature. ‘Innovative Research’ current actions include measures the Scottish research base has undertaken to develop and implement new tools to measure emissions, develop climate policy and inform change. SG investment, delivered through the SFC, have pulled together expertise in climate adaption and the SG’s RESAS ‘Strategic Research Programme’. Future actions include establishing a forum on adaptation. ‘Financial Innovation’ includes the FIRNS and the market establishment for responsible private investment in natural capital. Future actions involve the creation of conditions for access to responsible private sector finance for activities that are adaptation focussed.

5.137 ‘Economic development (B4)’ subobjectives include; ‘Financial’, ‘Scottish National Investment Bank’, ‘Enterprise Agencies’, ‘Regional Economic Development’, ‘Regional Just Transition Plans’, ‘Supply Chains’, ‘International Trade’, ‘Food supply and security’, ‘Food and Drink Industry Resilience’, ‘Transportation and Distribution’ and ‘Public Sector Procurement and Supply Chains’.

‘Financial’ current actions include FiSGAD and the SG will continue to engage with the financial services sector on key issues and opportunities facing the sector. Future opportunities involve supporting the roll out of mandatory climate risk-discourses, aligned with the Task Force on Climate-Related Financial Disclosures (TFCD) framework and monitored by the International Sustainability Standards Board. The SG will also ensure adaptation is integrated into the UK Green Taxonomy. Additionally, the Taskforce for Green and Sustainable Financial Services will develop an action plan. Current actions set out in ‘Scottish National Investment Bank’ involves delivering capital to businesses and projects which support a fairer, more sustainable economy. ‘Enterprise Agencies’ ongoing actions involve working with key regional partnership initiatives that support adaptation. In the future each enterprise will incorporate adaptation in all forthcoming corporate plans. Through future ‘Regional Economic Development’ actions, the SG will work in partnership with local government and a broad range of others to facilitate mature regional adaptation partnerships and collaborations covering all regions in Scotland by 2029. The SG will develop our approach to ‘regional just transition plans’ in 2024. The future ‘Supply Chains and International trade’ actions involve ensuring access

to vital goods, foods and services through supply chains through the consideration of international trade, food safety and security, transportation and public procurement. Future ‘International Trade and Global Supply Chains’ consider climate resilience and vulnerabilities in supply chains for each new Free Trade Agreement impact assessment, as well as include measures to support adaptation in the environmental section of its negotiating mandate for future FTAs. The SG will explore further research on the implications of a changing climate for global trade routes and to identify risks to Scotland’s key international supply chain. ‘Food Safety and Food Security’ future actions include FFS to protect the safety of food produced and sold in Scotland from the impacts of climate change and to improve Scotland’s domestic and international food security. Currently, the SG is providing funding towards Scotland Food and Drink Partnership and supports the delivery of the ‘Sustaining Scotland, Supplying the World’ strategy. In the long term the SG will build supply resilience to mitigate risks associated with climate change and improve supply chain efficiency. Ongoing actions set out in the ‘Public Sector Procurement and Supply Chains’ involve supporting resilience of public sector supply chains, and consideration of adaptation in public procurement activity and in the future to consider adaptation in public procurement activity. The ‘Transportation and Distribution’ subobjective sets out current work to develop and test a methodology for measuring the natural capital of the trunk road asset. Future actions involve TS to help to manage risks to business distribution networks from climate-related events.

Climate change mitigation

5.138 Overall, almost half of the scores in the Economy outcome are positive in relation to the climate change mitigation SEA objective.

5.139 In the Advice, Skills and Funding subobjective, actions outlined support farming, fishing and forestry businesses in relation to climate change mitigation. These are likely to result in reductions in carbon emissions, which will have positive effects on climate mitigation in the short to longer term, as these actions are implemented. Other actions also serve to increase tree planting and

subsequently carbon sequestration, with further benefits for climate change mitigation. In addition, actions which support increasing awareness of the risks of climate change, and helping these businesses prepare for adaptation to climate change, such as research and knowledge sharing may have indirect positive effects on climate change mitigation.

5.140 Actions for the objectives ‘increasing business awareness of climate risks’, ‘adaptation innovation’ and ‘economic development’ all involve education and increasing knowledge sharing with relation to climate change risks and adaptation measures across businesses, which may encourage behaviour change in the short to longer term. For example, this could include switching from fossil fuel derived to renewable forms of energy. In addition, the published guidance outlined in the ‘economic development’ objective will help raise awareness about the drivers and impacts of climate change, and may help facilitate a shift in behaviours to reduce the contribution of public bodies to climate change.

5.141 Actions relating to the objective ‘increasing business awareness of climate risks’ will improve businesses awareness of the risks of climate change and prepare them for adaptation to climate change, which may have indirect positive effects on climate change mitigation. In addition, actions outlined in ‘adaptation innovation’ will improve access to finance for projects and activities that are focussed on climate change adaptation or have co-benefits for emissions reduction and resilience will likely result in reductions in greenhouse gas emissions across businesses in Scotland. In addition, actions identified for the Fishing and aquaculture subobjective in the ‘farming, fishing and forestry’ objective include delivering emission reductions across the sector in line with Net Zero targets.

5.142 The promotion of Regional Just Transition Plans in this objective will also outline the challenges and opportunities faced by regions and identify appropriate action which will assist in climate change mitigation by helping to change behaviours which contribute to climate change.

Climate change adaptation

5.143 Overall, the majority of the scores in the Economy outcome are positive in relation to the climate change adaptation SEA objective. Significant positive scores are identified in relation to future actions of the ‘Increasing awareness of climate risk’ and ‘support and advice’ subobjectives in the ‘increasing business awareness of climate risks’ objective and the ‘Advice, Skills and Funding’ subobjective in the ‘Farming, Fishing and Forestry’ objective.

5.144 Actions outlined in the ‘Increasing awareness of climate risk’ and ‘support and advice’ subobjectives support innovation to support adaptation and resilience in a range of businesses and the development of climate resilient products and services and thus are expected to have positive effects in relation to climate change adaptation in the medium to longer term, as these are developed. The increased awareness and understanding of climate risks and adaptation measures for businesses will help ensure they are prepared for any effects of climate change in the future. The actions include disseminating information on climate risk and providing business with a suite of tools, resources and training material to assist them in being ready for the future effects of climate change. In addition, significant positive effects are identified in the short term in relation to the ‘Advice, skills and funding’ subobjective as actions outlined will require half of all agricultural funding to be conditional on delivering climate and nature benefits, including climate adaptation.

5.145 In relation to the “Business and coastal erosion” and “Business and water scarcity” subobjectives in the ‘increasing business awareness of climate risks’ objective, actions include implementing legislation which seeks to ensure sewerage and drainage services can adapt to the impacts of climate change, which supports good water quality. In addition, investment in flood resilience delivery plans and flood risk information, will help reduce the severity of impact from future flooding events.

5.146 A number of actions outlined in the ‘Farming, Fishing and Forestry’, ‘Adaptation Innovation’ and ‘Economic Development’ objectives involve the

current and improved collection and dissemination of information and education/training actions which will improve the understanding of the future effects of climate change and need for adaptation will help better prepare businesses for the future effects of climate change and better understand climate risks and make better, climate-resilient decisions with relation to their organisation.

5.147 In addition, actions within the Farming, Fishing and Forestry objectives improve the resilience of and help adapt the agricultural and forestry industries to climate change, including by supporting improvements in funding and financial support for farmers and crofters which will help support them in adapting to and increasing the resilience of their businesses to climate change.

5.148 Actions within the economic development objective also include risk and opportunity assessments which will help facilitate adaptation to the effects of climate change which will help facilitate adaptation to the effects of climate change, as well as outlining plans and strategies such as Regional Just Transition Plans and Transport Scotland's Approach to Climate Change Adaptation and Resilience and development of a Trunk Road Adaptation Plan. The former of which will assist in climate change adaptation and also mitigation by helping to change behaviours which contribute to climate change. Actions also support the implementation of controls which will help assess risk of bacterial pathogens and natural toxins in food which may be climate/weather related.

Biodiversity, flora and fauna

5.149 Less than half of the scores in the Economy outcome are positive in relation to the biodiversity, flora and fauna SEA objective. A significant positive score is identified in relation to future actions of the 'Advice, Skills and Funding' subobjective in the 'Farming, Fishing and Forestry' objective. Some minor positive effects are identified within all objectives apart from 'Increasing business awareness of climate risks' which has entirely negligible effects in relation to this SEA objective.

5.150 Positive effects are expected to be significant with relation to the ‘Advice, skills and funding’ subobjective as actions will require half of all agricultural funding to be conditional on delivering climate and nature benefits, which is likely to result in benefits for biodiversity. Benefits are likely to be greater in the long term.

Water

5.151 Minor positive effects are identified for a small proportion of the subobjectives within the Business outcome in relation to water. Within the ‘Increasing business awareness of climate risks’ objective these are for future actions relating to the ‘Business and flooding’ and ‘Business and water scarcity’ subobjectives. Within the ‘Farming, Fishing and Forestry’ objective these are in relation to ‘Pests and agriculture’, ‘Forestry sector’ and ‘Fishing and aquaculture’. Within the ‘Adaptation Innovation’ objective these are for ‘CivTech’, ‘Innovative Research’ and ‘Financial Innovation’. Within the ‘business development’ objective these are in relation to the ‘Financial’, ‘Public Sector Procurement and Supply Chains’ and ‘Transportation and Distribution’ subobjectives.

5.152 The objectives of ‘Increasing business awareness of climate risks’, ‘Farming, Fishing and Forestry’ and ‘economic development’ all include actions which involve the continued and improved collection and dissemination of information, particularly that relating to flood risk. This will result in more well-informed and sustainable decisions being taken regarding climate change risks, as well as increasing transparency and understanding of climate risks. This will help support a shift in investment away from areas where there is a high risk posed by climate change e.g., areas of high flood risk. ‘Increasing business awareness of climate risks’ also includes actions to support the long-term water supply for businesses and further investment in water and sewerage services which will protect water quality.

5.153 The objective of ‘Adaptation Innovation’ includes actions to establish private investment in natural capital, which is likely to result in positive effects

for water quality as a result of greater uptake of nature-based projects. In addition, investment in nature-based solutions and natural capital which builds on the existing Woodland Carbon Code and Peatland Code will support the most appropriate management of these areas, with associated positive impacts on the water environment. The ‘Farming, Fishing and Forestry’ subobjective also supports increased riparian planting will help improve the quality of watercourses by providing shading and reducing surface water runoff into the watercourse, as well as actions which relate to the management of water resources during periods of low rainfall. Benefits are likely to be greater as vegetation matures.

Air

5.154 Minor positive effects are identified for a small number of the subobjectives within the Business outcome. This includes within the ‘advice, skills and funding’ subobjective under the ‘Farming, Fishing and Forestry’ objective, the ‘Innovative Research’ and ‘Financial Innovation’ subobjectives within the ‘Adaptation Innovation’ objective and the ‘Public Sector Procurement and Supply Chains’ subobjective within the ‘economic development’ objective. The majority of subobjectives have negligible effects in relation to air.

5.155 In the ‘advice, skills and funding’ subobjective under the ‘Farming, Fishing and Forestry’ objective, actions relating to the promotion of tree planting throughout the lifetime of the Plan are expected to have indirect positive effects on air quality due to the increased number of trees helping to filter pollutants from the air.

5.156 In the Adaptation Innovation objective, actions outlined to establish private investment in natural capital are likely to result in positive effects for air quality, as a result of greater uptake of nature-based projects such as woodland creation. Woodland creation subsequently will help filter pollutants from the air, although greater benefits are found in areas with higher levels of air pollution.

5.157 Benefits are likely to be greater in the long term as vegetation matures.

Soil

5.158 Minor positive effects are identified for a small number of the subobjectives within the Business outcome. This includes the subobjectives of ‘CivTech’, ‘Innovative Research’ and ‘Financial Innovation’ within the ‘Adaptation Innovation’ objective, the subobjective of ‘Public Sector Procurement and Supply Chains’ within the ‘economic development’ objective.

5.159 Actions within the ‘adaptation innovation’ objective to establish private investment in natural capital, is likely to result in positive effects for soil quality as a result of greater uptake of nature-based projects which are subsequently likely to lead to improvements in the soil quality. In addition, investment in nature-based solutions and natural capital which builds on the existing Woodland Carbon Code and Peatland Code is likely to result in greater enhancements to areas of woodland and peatland which are intrinsically linked to protecting or improving the condition of existing soils.

5.160 Benefits are likely to be greater in the long term as vegetation matures.

Landscape and geodiversity

5.161 Overall, a small number of positive effects are expected in relation to landscape and geodiversity from the four objectives in the Economy, Business and Industry outcome. Two objectives (Increasing business awareness of climate risks and Economic Development) are expected to result in a negligible effect. The Farming, Fishing and Forestry objective is expected to result in minor negative effect as well.

5.162 Actions relating to the promotion of tree planting throughout the lifetime of the Plan under advice, skills and funding or planting of riparian woodland under ‘forestry sector’ within the Farming, Fishing and Forestry objective, is expected to have positive effects on landscape as a result of increasing tree cover and woodlands throughout the landscape. These landscape features can lead to an

improvement in landscape character. However, potential negative effects may arise as a result of planting in unsuitable locations, which could adversely affect the character of the landscape. Actions to establish private investment in natural capital under the Adaptation Innovation objective is likely to result in positive effects. The greater uptake of nature-based projects relating to a variety of different habitat types is likely to positively contribute towards landscape character.

5.163 These effects are expected in the short to long term as tree planting will result in short term benefits. However, greater benefits are likely in the long term.

Cultural heritage and historic environment

5.164 Overall, limited effects are expected in relation to cultural heritage and historic environment across all four objectives in the Economy, Business and Industry outcome. Two objectives (Increasing business awareness of climate risks and Economic Development) are expected to result in negligible effect. The Farming, Fishing and Forestry objective is expected to result in minor negative effect as well.

5.165 Actions relating to the promotion of tree planting throughout the lifetime of the Plan under advice, skills and funding or planting of riparian woodland under forestry sector within the Farming, Fishing and Forestry objective, is expected to have positive effects as a result of increasing tree cover and woodlands throughout the landscape which often forms the setting to heritage assets. These features can lead to an improvement in the setting of heritage assets and historic environments. However, potential negative effects may arise as a result of planting in unsuitable locations, which could adversely affect the setting of heritage assets and/or affect buried archaeology.

5.166 Actions to establish private investment in natural capital through the Adaptation Innovation objective may result in positive effects. The greater uptake of nature-based projects relating to a variety of different habitat types is

likely to create and enhance landscape features which often forms part of the setting of heritage assets. For example, woodlands/trees and peatlands.

5.167 These effects are expected in the short to long term as tree planting will result in short term benefits. However, greater benefits are likely in the long term.

Material assets

5.168 Overall, mainly minor positive effects are expected in relation to material assets across all four objectives in the Economy, Business and Industry outcome.

5.169 All actions (excluding Business and Coastal Erosion) within the 'Increasing business awareness of climate risks' objective are expected to have positive effects. Increased awareness and understanding of climate adaptation and climate risks for businesses will support the resilience of businesses across Scotland. They also seek to ensure the long-term supply of water for businesses and that water infrastructure can adapt to climate change. In addition, providing information to businesses and investing further in flood resilience will help increase the viability of businesses, with subsequent benefits for population and human health.

5.170 All actions (excluding 'Farming and the wider Agriculture sector') within the Farming, Fishing and Forestry objective are expected to have positive effects. Increased awareness and understanding of climate adaptation and climate risks for businesses will support the resilience of businesses across Scotland. In addition, support for farmers including research into crop and livestock resilient agricultural production will help make agricultural businesses more resilient to the effects of climate change. In relation to forestry, the development of resilience action plans will increase the resilience of forests and the materials they provide to increasing threats associated with climate change. In addition, guidance will be provided on designing and managing species within forests to improve the forest's resilience. In terms of the fishing and

aquaculture industry, actions seek to develop Fisheries Management Plans to increase and maintain sustainability of fish stocks. They also seek to produce more seafood whilst reducing waste in the industry.

5.171 All actions (excluding CivTech) under the Adaptation Innovation objective are expected to have positive effects. Increased awareness and understanding of climate adaptation and climate risks for businesses will support the resilience of businesses across Scotland. Additional research into removing any barriers preventing businesses from realising adaptation opportunities may also result in more opportunities for adaptation and as such increased resilience of the businesses. Increased sharing of knowledge and information across businesses will improve the skills within the sector, providing economic benefits.

5.172 Actions seeking to ensure food security and supply through the Economic Development objective will have positive effects. Such measures include implementing official controls to verify safety of the food chain in terms of pathogens and toxins. Furthermore, ongoing surveillance and monitoring of risks and threats to the food supply chain will help build resilience of supply to a changing climate. In addition, additional research into sustainable food supply and development of new food products, production system and packaging innovations will help promote more sustainable food supply. The provision of information on climate risk for private sector organisations in Scotland will help organisations better understand climate risks and make better decisions in relation to their organisation. Furthermore, greater access to green finance and investment to support reaching net zero will also support businesses. With respect to supply chains for food and drink, the Scottish Government seeks to build supply resilience to mitigate risks associated with climate change and improving supply chain efficiency. Further research on how the climate may impact global trade routes and supply will also be undertaken. This will help to maintain the supply chain, with positive effects on material assets. The implementation of the Approach to Climate Change Adaptation and Resilience by Transport Scotland will help ensure the Scottish transport network is resilient to the impacts of climate change. Overall, this could make the businesses more resilient to the future effects of climate change, with subsequent benefits in relation to material assets.

5.173 These effects are expected in the short to long term reflecting the time for information and awareness to become action.

Population and human health

5.174 Overall, mainly minor positive effects are expected in relation to population and human health across all four objectives in the Economy, Business and Industry outcome.

5.175 Actions under the Increasing business awareness of climate risks; Farming, Fishing and Forestry and Adaptation Innovation objective are expected to have positive effects. Increased awareness and understanding of climate adaptation and climate risks for businesses will increase their resilience. Business resilience will indirectly support population and human health as a result of improved financial stability and the health and wellbeing of those employed in these industries. In addition, improved research into the resilience of crops and livestock will help ensure a secure supply of food. Increased awareness of climate risk may also benefit people in their personal lives. Additional benefits for population and human health are likely to arise by actions through Economic Development objective that seek to ensure access to vital goods, foods and services through resilient supply chains. Measures such as implementing official controls, food sampling, and monitoring trends in foodborne illnesses will help ensure public health is protected. Furthermore, greater research into the effects of climate change on food supply will help protect from food shortages and food related illnesses in the future.

5.176 Actions under the Economic Development objective include raising awareness and sharing knowledge about drivers and potential effects of climate change. Sharing information will have positive effects on population and human health by improving people’s general awareness of climate change in their personal lives. It also will help improve people’s skills relating to climate, particularly for those working within the business sector.

5.177 In addition, actions under the 'Increasing business awareness of climate risks' and 'Adaptation Innovation' objective seek improved financial support for delivering nature-based solutions and natural capital. These actions provide ecosystem services in terms of improved air and water quality and supply, and opportunities for recreation, which all contribute towards better health of the population.

5.178 These effects are expected in the short to long term. Greater benefits are expected in the long term as businesses and the economy implement adaptation.

Outcome 5: International Action (IA)

This outcome covers 'Vulnerable Communities (IA1)', 'International advocacy (IA2)', which includes 'International engagement' subobjective, and 'A global hub for adaptation research (IA3)' objective, which includes 'Research Expertise' and 'Loss and damage'.

Current actions set out in 'Vulnerable communities' include the Climate Just Communities Programme, Climate Justice Resilience Fund and Feminist Action for Climate Justice. Current actions in the 'International advocacy' objective include the continued participation at future COPs and alignment with global adaptation commitments and biodiversity frameworks, as well as leading a global sub-state coalition through Edinburgh Process for Biodiversity. The 'International engagement' subobjective sets out the continuation of Scotland as an international climate leader to influence and engage with counterparts, including national governments, through Under2, Regions4 and the RegionsAdapt Initiative. Additionally, feed into the drafting of key messaging around climate action and papers in response to the UNFCCC Global Stocktake. Current actions under the Women's Environment and Development Organisation and British-Irish Council are set out. Future actions involve working with networks on adaptation action and contribute annually to running of RegionsAdapt. Furthermore, the SG will hold a diverse range of events at COP with high level ministerial engagement and ensure that there is at least

one adaptation-focused event organised. Current ‘research expertise’ include CXC, SAMS/MASTS, James Hutton Institute and National Centre for Resilience. ‘Loss and damage’ involves Scotland’s conference; Addressing Loss and Damage, where the resulting synthesis was launched in March 2023. Goals for 2029 include continuing to support the development of the global evidence base on addressing loss and damage, in a way that is gender-responsive, and work with partners to build momentum from non-state actors to understand how best to unlock loss and damage finance at a subnational level.

Climate change mitigation

5.179 Overall, mainly positive effects are expected for ‘Vulnerable Communities (IA1)’ and ‘International advocacy (IA2)’ in relation to climate change mitigation.

5.180 The established programmes within the Vulnerable Communities objective focus on supporting the Global South to adapt to the impacts of climate change and deliver climate justice. The ongoing and new actions under international conventions supports continued participation at Climate COP, UNFCCC and alignment with global adaptation and biodiversity frameworks. Additionally, as set out in international engagement, the Scottish Government hosted the European ministerial meeting in Brussels in 2023 were challenges and successes experienced implementing climate policies were shared. These actions are expected to support a reduction in greenhouse gas emissions. Therefore, minor positive effects are expected. Effects are likely to be greater in the longer term as actions from policies, conventions and engagement are implemented.

5.181 Negligible effects are expected for the remaining actions.

Climate change adaptation

5.182 Overall, mainly positive effects are expected for all three objectives in relation to climate change mitigation for the international action outcome.

5.183 Vulnerable communities are expected to have minor positive effects through the involvement in the following programmes: Climate Just Communities Programme, Climate Justice Resilience Fund and the Feminist Action for Climate Justice. Minor positive effects are expected for all actions under international advocacy. This includes participation at UNFCCC, continuing to align with global adaptation and biodiversity frameworks, one adaptation-focused event at each COP, contributing to RegionsAdapt, involvement in the climate adaptation subgroup as part of the British-Irish Council. Both actions under 'A global hub for adaptation research' support increasing knowledge and understanding of addressing slow-onset and non-economic loss and damage and how to unlock loss and damage finance. These objectives will help Scotland and at an international level adapt to climate change, in particular, adapting to extreme weather events as a result of climate change. Understanding how to unlock 'loss and damage' finance, specifically will aid understanding of how to get finance to repair any loss or damage caused by extreme weather events. Hence a minor positive effect is expected for the future actions for this subobjective. These effects are expected to be in the medium to long term.

5.184 Negligible effects are expected for the remaining actions.

Biodiversity, flora and fauna

5.185 Mainly minor positive effects are expected for 'Vulnerable communities' and 'A global hub for adaptation research' objectives in relation to biodiversity, flora and fauna.

5.186 The established programmes within the ‘Vulnerable Communities’ objective focus on supporting the Global South to adapt to the impacts of climate change, which could have an indirect positive effect on biodiversity. Likewise, through ‘A global hub for adaptation research’, research programmes, understanding how to best unlock loss and damage finance, and supporting the development of a global evidence base on addressing non-economic loss and damage could have positive effects on biodiversity and ecosystems.

5.187 Negligible effects are expected for the remaining actions.

Water

5.188 Mainly minor positive effects are expected for ‘Vulnerable communities’ and ‘A global hub for adaptation research’ objectives in relation to water.

5.189 The established programmes within the ‘Vulnerable Communities’ objective focus on supporting the Global South to adapt to the impacts of climate change, which could positively affect water. Additionally, research programmes such as James Hutton Institute under ‘Research Expertise’ and supporting the development of global evidence base on addressing ‘loss and damage’ could help to adapt to an increase in flood risk and water scarcity as a result of extreme weather events in the long term. Likewise, understanding how to unlock loss and damage finance could support opportunities for investment into the water environment.

5.190 Negligible effects are expected for the remaining actions.

Air

5.191 Mainly minor positive effects are expected for ‘Vulnerable communities’ and ‘A global hub for adaptation research’ objectives and ‘international conventions’ subobjective in relation to air.

5.192 The established programmes within the ‘Vulnerable Communities’ objective focus on supporting the Global South to adapt to the impacts of climate change. The actions under ‘international conventions’, Climate COP and ClimateXChange under ‘Research expertise’ supports the transition to net zero, which includes reducing greenhouse gas emissions. This will have a positive effect on air quality within Scotland and at an international level. Additionally, supporting the development of global evidence base on addressing ‘loss and damage’ and understanding how to unlock loss and damage finance could help to support climate adaptation measures that improve air quality and reduce the levels of harmful pollutants in the long term.

5.193 Negligible effects are expected for the remaining actions.

Soil

5.194 Mainly minor positive effects are expected for ‘Vulnerable communities’ and ‘A global hub for adaptation research’ objectives in relation to soil for the international action outcome.

5.195 The established programmes within the ‘Vulnerable Communities’ objective focus on supporting the Global South to adapt to the impacts of climate change. Furthermore, supporting the development of global evidence base on addressing ‘loss and damage’ and understanding how best to unlock loss and damage finance could support measures to help adapt to the effects of climate change that could disrupt soil structures. This could support improvements to the soil structure and geological features following loss and damage. ‘Research expertise’ through the James Hutton Institute supports sustainable management of land, crops and natural resources. This could have an indirect positive effect on soil quality and help preserve the best quality soils.

5.196 Negligible effects are expected for the remaining actions.

Landscape and geodiversity

5.197 Mainly minor positive effects are expected for ‘Vulnerable communities’ and ‘A global hub for adaptation research’ objectives in relation to landscape and geodiversity.

5.198 The established programmes within the ‘Vulnerable Communities’ objective focus on supporting the Global South to adapt to the impacts of climate change, although no future actions were identified. Additionally, supporting the development of a global evidence base on addressing non-economic ‘loss and damage’ could help in understanding the effects of loss and damage on landscape character and landscape features, allowing better understanding of how to address loss and damages. However, the objective could include reference to the types of non-economic damage that the global evidence base would include.

5.199 Negligible effects are expected for the remaining actions.

Cultural heritage and historic environment

5.200 Mainly minor positive effects are expected for ‘Vulnerable communities’ and ‘A global hub for adaptation research’ objectives in relation to cultural heritage and historic environment.

5.201 The established programmes within the ‘Vulnerable Communities’ objective focus on supporting the Global South to adapt to the impacts of climate change, which could have an indirect positive effect. Additionally, supporting the development of a global evidence base on addressing non-economic ‘loss and damage’ could help in understanding the effects of loss and damage on heritage assets, allowing better understanding of how to address these loss and damages. In addition, understanding how to best unlock loss and damage finance could support enhancements to and retrofitting heritage assets.

5.202 Negligible effects are expected for the remaining actions.

Material assets

5.203 Mainly positive effects are expected for ‘Vulnerable communities’ and ‘A global hub for adaptation research’ objectives in relation to material assets for the international outcome objective.

5.204 The established programmes within the ‘Vulnerable Communities’ objective and ‘Research and expertise’ will support adaptation to climate change which could ensure the resilience of cities and other settlements. The research initiatives will also help to understand how to ensure water, energy, food security as well as managing finite resources. The actions under loss and damage aim to address the losses and damages that could occur as a result of climate change. Additionally, sustainability of towns and cities will be ensured through developing the global evidence base on addressing non-economic and slow-onset loss and damage and understanding how best to unlock loss and damage finance to support investment in the long term. Therefore, a significant positive effect is expected for future ‘loss and damage’ actions.

5.205 Negligible effects are expected for the remaining actions.

Population and human health

5.206 Mainly minor positive effects are expected for ‘Vulnerable communities’ and ‘A global hub for adaptation research’ objectives in relation to water.

5.207 The established programmes within the ‘Vulnerable Communities’ objective focus on supporting the Global South to adapt to the impacts of climate change, which supporting adaptation to climate change will have a positive effect on communities making them more resilient to the effects of climate change and reduce the potential for negative impacts on livelihoods as

a result of climate change. In particular the actions will support those most vulnerable including women and children.

5.208 The established programmes within the ‘Vulnerable Communities’ and ‘Research Expertise’ subobjectives support adaptation to climate change and energy security of resources, which will have a positive effect on communities, making them more resilient to the effects of climate change thus reducing the potential for negative impacts on livelihoods. The actions will support those most vulnerable including women and children. Additionally, supporting a global evidence base on addressing non-economic and slow-onset ‘loss and damage’ in a way that is gender responsive will have a positive impact on reducing gender inequality in dealing with loss and damage and also will help communities adapt to the effects of climate change and extreme weather events. Understanding how to unlock loss and damage finance could support investment in infrastructure and buildings. Therefore, minorpositive effects are expected for current ‘Vulnerable Communities’ and future ‘loss and damage’ actions. This could have long term effects in supporting economies and towns and cities while adapting the effects of climate change.

5.209 Negligible effects are expected for the remaining actions.

Cumulative, secondary and synergistic effects

5.210 This section of the Environmental Report sets out the potential cumulative, secondary, and synergistic effects which may arise from the actions in the draft SNAP. It explores potential effects in relation to each of the SEA topics and identifies key issues arising for each topic. Table D.1 in Appendix D provides an overview of the scores for each action theme.

Climate change mitigation

5.211 Many of the outcomes and subsequent objectives and actions within SNAP3 are likely to have benefits for climate change mitigation by reducing greenhouse gas emissions within Scotland.

5.212 A number of objectives and actions, particularly through the objectives under Outcome 1: Nature Connects (NC), support enhancements to and the creation of green infrastructure which could include additional tree cover and habitat and peat restoration. This will improve the management of soils which could have a positive impact on reducing emissions from soils, including peatland, and increasing the sequestration of greenhouse gas emissions. The objectives and actions include the enhancement and restoration of blue carbon spaces. There is potential synergy between the objectives in Outcome 1 and the Outcome 2: Communities (C) preparation and response objective as it supports the reduction in wildfires which could reduce the potential for loss and damage of trees and woodland planted through the actions within the objectives of Outcome 1.

5.213 Objectives through Outcome 2: Communities (C) support local climate change related issues awareness and partnership working which can also have positive impacts on reducing greenhouse gas emissions.

5.214 In addition, objectives such as Power assets and the energy system and Transport system support a transition to net zero which could increase the use of renewable energy and therefore, reducing the levels of greenhouse gas emissions released through energy and transport use. Furthermore, objectives and actions under Outcome 4: Economy, business and industry support improving awareness of climate change and helping businesses prepare to adapt to a changing climate. This will support a transition to net zero within businesses and the Scottish economy, lowering the future contributions to climate change.

5.215 Overall, minor positive cumulative effects are identified for climate change mitigation with notable benefits found within the objectives under Outcome 1: Nature Connects, Outcome 2: Communities (C) and Outcome 4: Economy, Business and Industry (B).

Climate change adaptation

5.216 All of the objectives and actions within the Scottish National Adaptation Plan will contribute towards climate change adaptation. A large number of significant positive effects are expected in relation to climate change adaptation particularly within the objectives and actions in Outcome 1: Nature Connects (NC), Outcome 2: Communities (C) and Outcome 3: Public Services (PS).

5.217 Several of the objectives and subsequent actions support enhancements to and the delivery of new green and blue infrastructure. Green infrastructure can provide a natural solution to adapting to the adverse effects of climate change such as severe weather which could include flooding and increasing temperatures. Green infrastructure within urban areas can offer areas for shading and cooling as temperatures are expected to rise as a result of climate change. In addition, enhancing green infrastructure and the provision of new tree cover and restoration works could have secondary benefits for biodiversity, flora and fauna, increasing connectivity which could help wildlife adapt to climate change and increase resilience. All the objectives and actions within Outcome 1: Nature Connects (NC) support enhancements to and the creation of new green infrastructure.

5.218 In addition, a number of the objectives and subsequent actions support collaborative and partnership working at a national and international scale to support adapting to climate change, particularly in relation to extreme weather events. This will help ensure that knowledge on best practice is shared and there is a co-ordinated approach to climate change adaptation. In particular, the A global hub for adaptation research objective aims to reduce the loss and damage associated with the adverse effects of climate change such as extreme weather events and supports international knowledge sharing. A number of

objectives and subsequent actions also support the creation of national plans and programmes to help with adapting to climate change within communities, businesses and creating more resilient infrastructure. This will have secondary benefits for population and human health and material assets. In particular, the objectives and actions under Outcome 3: Public Services aim to create resilient essential infrastructure such as health and social care, transport and drainage systems against the adverse effects of climate change. This will reduce the risk of damage to key infrastructure as a result of climate change. This is further supported by the objectives and subsequent actions under Outcome 4: Economy, Business and Industry (B) which deals with supporting the resilience of businesses, agriculture and the economy to the effects of climate change and helping these areas adapt. This will also likely increase the uptake of climate change adaptation measures across a variety of business sectors creating a more resilient economy. Overall, significant positive cumulative effects are identified for climate change adaptation.

Biodiversity, flora and fauna

5.219 Many of the outcomes and subsequent objectives and actions within SNAP3 are likely to have positive effects for biodiversity, flora and fauna in Scotland. The objectives under Outcome 1: Nature Connects (NC) generally result in significant positive effects.

5.220 A number of objectives and actions support the enhancement of habitat networks, habitat restoration and increased blue and green infrastructure investment. There are also objectives and actions which support tree planting and woodland creation and restoration. These will benefit biodiversity, flora and fauna by supporting adaptation to climate change and providing enhanced habitats and connectivity between habitats. In particular, the Marine ecosystems and the blue economy objective support enhancements to the marine environment which will have a positive impact on marine wildlife and ecosystems. This is supported by the ‘A global hub for adaptation’ research objective which aims to help understand the effects of loss and damage on

biodiversity and ecosystems, allowing better understanding of how to address this, and providing adaptation measures to reduce any further impact.

5.221 There is the potential for positive secondary effects for biodiversity, flora and fauna through objectives and actions that support climate change mitigation and adaptation. This is likely through objectives and actions which include woodland creation, improving the marine environment and habitat creation through rewilding. This is likely within the objectives and actions under Outcome 2: Communities (C). Although some minor negative effects are identified, overall, significant positive cumulative effects are identified for biodiversity, flora and fauna.

Water

5.222 Many of the outcomes and subsequent objectives and actions within SNAP3 are likely to have positive effects for water in Scotland. The objectives under Outcome 1: Nature Connects (NC) generally result in significant positive effects.

5.223 Positive effects on the water environment will likely arise from addressing flood resilience and coastal change, managing water scarcity, expanding blue and green infrastructure, expanding landscape scale interventions, and supporting freshwater habitats. These actions will reduce flood risk, improve water quality and temperature, and improve the management of water levels, reducing the incidences of low flow. Overall, this will help the water environment adapt to the adverse impacts of climate change.

5.224 A number of objectives including the Preparation and response, New and existing buildings, Culture and historic environment, Accessing public services, Water, Sewerage and drainage, Increasing business awareness of climate risks and Farming, fishing and forestry objectives support flood resilience including flood management measures such as sustainable urban drainage systems. The Transport system objective supports the resilience of the transport network within Scotland to flooding events. A global hub for adaptation research

objective aims to address loss and damage and supports adaptation to an increased risk of flooding and water scarcity. Overall, this will reduce flood risk and support the adaptation of the water environment to climate change.

5.225 Objectives and actions that result in positive effects on the water environment could have secondary benefits on biodiversity, flora and fauna and population and human health. Improving water quality and managing water levels will help maintain ecosystems and marine, coastal and freshwater habitats. In addition, better managing water levels will support resilience of communities during droughts and flooding events and have a positive effect on water security. Overall, minor positive cumulative effects are identified for water.

Air

5.226 Many of the outcomes and subsequent objectives and actions within the Scottish National Adaptation Plan are likely to have benefits for air quality in Scotland.

5.227 Objectives and their subsequent actions that promote climate mitigation and a transition to net zero will have a positive effect on reducing greenhouse gas emissions. This will have a positive effect on air quality. In particular, the Place Based Collaboration objective supports climate mitigation. In addition, building the resilience of buildings and properties could support improvements in air quality by reducing fossil fuel consumption and improving the energy efficiency of these buildings. This is supported by the Culture and Historic Environment, Accessing Public Services and A global hub for adaptation research objectives. Actions through the Transport System objective support the decarbonisation of transport and investment in renewable energy production which could have a positive effect on improving air quality.

5.228 The Preparation and Response objective supports better training and management in relation to wildfires. This will help in preventing wildfires and reducing the spread of wildfires when they do occur. Overall, this will have a

positive effect on reducing the release of greenhouse gas emissions as a result of these wildfires resulting in a positive effect on air quality.

5.229 A number of actions within the objectives support increasing green infrastructure and habitat restoration which could include additional tree cover and vegetation. This will have a positive effect on air quality by filtering air pollutants. This is particularly notable through all the objectives under Outcome 1: Nature Connects and the Farming, Fishing and Forestry and Adaptation Innovation objective under Outcome 4: Economy, Business and Industry.

5.230 Overall, minor positive cumulative effects are identified for air quality with notable benefits to air found within the objectives under Outcome 1: Nature Connects and Outcome 5: International Action (IA).

Soil

5.231 Many of the outcomes and subsequent objectives and actions within the Scottish National Adaptation Plan are likely to have benefits for Scotland's soils.

5.232 Positive effects may arise from objectives and actions which support positive management of soils through reduced soil erosion and enhancements to and creation of green infrastructure and nature networks. In addition, objectives which support woodland and peatland restoration and the creation of nature networks could improve soil quality. This will aid in creating healthy soils which have higher levels of nutrients, higher rates of water absorption and improved soil fertility. This is included through the objectives under Outcome 1: Nature Connects (NC).

5.233 Objectives and actions that support climate change mitigation and adaptation could result in secondary benefits to the soil environment through enhancing soil quality and absorption rates. This is expected through the objectives under Outcome 2: Communities (C). In addition, the Preparation and response objective aims to reduce harm to soils from extreme weather events

such as flooding and wildfires. In particular, the impact of wildfires on soils can decrease soil nutrient levels, and release soil carbon.

5.234 Improvements in soils may have related positive effects for water and climate change adaptation by reducing surface water flooding. In particular, from the objectives within Outcome 4: Economy, Business and Industry which support the resilience of the economy and businesses in relation to the adverse impacts of climate change. Therefore, there is a positive synergy between the objectives under Outcome 1: Nature Connects (NC) which support enhancements to soils and objectives under Outcome 4: Economy, Business and Industry (B) which support the resilience of businesses and economies against extreme weather events.

5.235 Overall, minor positive cumulative effects are identified for soil with notable benefits to soil found within the objectives under Outcome 1: Nature Connects.

Landscape and geodiversity

5.236 Many of the outcomes and subsequent objectives and actions within SNAP3 are likely to have benefits for landscape within Scotland.

5.237 Objectives and actions aiming to increase and enhance green and blue infrastructure are expected to have a positive effect on landscape and landscape character. This could include the creation of woodland/ tree planting, riparian planting, and enhancement of coastal habitats and peatlands. A number of objectives under Outcome 1: Nature Connects (NC) support enhancements to and the creation of green infrastructure. In addition, the Marine ecosystems and the blue environment objective supports the protection of Scotland’s coastal landforms and reducing coastal erosion. This will have a positive effect on Scotland’s coastal landscape.

5.238 A number of objectives support climate change adaptation and resilience of Scotland's landscape. This will have mixed effects on protecting the character and quality of Scotland's landscapes, through bringing about landscape change. In particular, the Preparation and response objective contains actions which aim to reduce the number of wildfires and flooding events which may result in both changes to the built environment and also changes in vegetation planting and management.

5.239 There is the potential for secondary benefits as a result of objectives and actions which support improvements to soil quality including the restoration of peatland soils. This will have subsequent benefits for landscape as peatlands are an integral part of the Scottish landscape.

5.240 Overall, minor positive cumulative effects are identified for landscape and geodiversity with notable benefits to landscape found within the objectives under Outcome 1: Nature Connects (NC) and Outcome 2: Communities (C).

Cultural heritage and historic environment

5.241 Several of the outcomes and their subsequent objectives and actions within the Scottish National Adaptation Plan are likely to have minor positive effects for cultural heritage and the historic environment in Scotland. The Culture and historic environment objective will result in significant positive effect. However, some mixed effects (minor positive and minor negative) may arise through objectives within Outcome 1: Nature Connects, Outcome Two: Communities (C) and Outcome 4: Economy, Business and Industry.

5.242 The Development Planning, Nature Networks, Natural carbon stores and sinks objective and the Farming, fishing and forestry objectives propose enhancements to blue/green infrastructure which could enhance the setting of a historical asset if well designed. These objectives could also have an adverse impact on known and unknown archaeological features through enhancement projects.

5.243 A number of objectives support climate change adaptation and resilience of buildings including those of historic and cultural significance to extreme weather events such as flooding. This will have a positive impact on protecting the historic environment by reducing loss of and damage to historical assets from climate change. In addition, the Place based collaboration and Culture and historic environment objective will ensure that the impacts on the historic environment are considered during the creation of proposals and promote collaboration. Conversely, the adaptation of new and existing buildings to the adverse effects of climate change could impact on the quality and setting of historic assets.

5.244 However, objectives such as Nature-based solutions and Marine ecosystems and the blue economy, could potentially have negative effects on historical assets by supporting coastal change and new economic activities. In particular, promoting naturally functioning coastal landforms, could lead to the potential for heritage assets near the coast to be lost to erosion. Overall, cumulative minor positive effects are identified for cultural heritage and the historic environment.

Material assets

5.245 Several of the outcomes and their subsequent objectives and actions within the Scottish National Adaptation Plan are likely to have minor positive effects for material assets within Scotland. Significant positive effects are likely to arise within Outcome Two: Communities (C) and Outcome 3: Public Services (PS).

5.246 A large number of the objectives and subsequent actions aim to protect material assets from the adverse effects of climate change such as extreme weather. In addition, some of the objectives and actions also support enhancements to buildings and business sectors to ensure their resilience against the adverse effects of climate change. Overall, this will reduce the potential for damage to infrastructure as a result of climate change and support the creation of resilient places. In particular, the Preparation and response

objective under Outcome 2: Communities (C) supports the resilience and protection of material assets such as buildings from the effects of climate change. This is supported by the New and existing buildings and Culture and historic environment objectives which aim to create new and retrofit existing buildings to make them resilient to the effects of climate change reducing the potential for damage to these buildings. The objectives and actions within Outcome 3: Public Services (PS) specifically deals with creating resilient essential infrastructure such as healthcare, transport and energy to climate change, ensuring there is minimal disruption to these services. Finally, the objectives and actions under Outcome 5: International Action (IA) consider the impact of loss and damage and better ways of dealing the impacts of climate change and how to make economies and communities more resilient to climate change.

5.247 In addition, a number of objectives and the subsequent actions support enhancements to and the inclusion of new green and blue infrastructure which could provide a wide range of benefits including flood resistance, ecosystem services and improving soil and water quality. This is mainly through the objectives and actions within Outcome 1: Nature Connects (NC).

5.248 Overall, minor positive cumulative effects are identified for material assets with notable benefits found across all the outcomes.

Population and human health

5.249 Several of the outcomes and their subsequent objectives and actions within the Scottish National Adaptation Plan are likely to have minor positive effects for population and human health. Significant positive effects are likely to arise within Outcome Two: Communities (C).

5.250 A number of objectives and actions under Outcome 1: Nature Connects (NC) support enhancements to and the creation of new green infrastructure. The Place Based Collaboration objective under Outcome 2: Communities (C) also provides protection for greenspaces which could include allotments and

community gardens. This could have a positive effect on physical and mental wellbeing including quality of life by offering improved areas for recreation and exercise. In addition, providing tree cover along with green spaces offers areas for cooling and will improve air quality through carbon sequestration. This is particularly important as temperatures are expected to increase as a result of climate change. This is further supported by the Preparation and response objective which aims to support communities and create resilient communities against all types of extreme weather that could be an adverse impact of climate change. The 'A global hub for adaptation research' objective provides a number of secondary benefits to population and human health and links in with a number of the other objectives and actions under Outcomes 2-4. This is because the objective supports the sharing of knowledge at an international level which could help Scotland better adapt to climate change and consider new methods of doing so. This could bring further positive benefits to the population of Scotland if new methods are considered when creating resilient businesses, economies and infrastructure that support key services and livelihoods.

5.251 The health of the population of Scotland is further considered within the objectives and actions under Outcome 3: Public Services (PS). The objectives and actions specifically deal with creating resilient essential infrastructure such as healthcare, transport and energy to climate change ensuring there is minimal disruption to these services. This will ensure that people and communities have access to essential services having a positive impact on health. Specifically, the Power Assets and the energy system objective deals with ensuring energy security with benefits for households. This will have positive impacts on the general population as well as those who are vulnerable.

5.252 The objectives and actions under Outcome 4: Economy, business and industry support creating resilient businesses and economies. This will have a positive impact on maintaining livelihoods and job security. In particular, the Farming, fishing and forestry objective supports resilience within these specific sectors ensuring food security as well as job security.

5.253 Overall, minor positive cumulative effects are identified for material assets with notable benefits found across all the outcomes.

5.254 In addition to the cumulative, secondary and synergistic effects identified from the outcomes and objectives of the draft SNAP3, there are also strong interlinkages with cross cutting policy proposals. SNAP3 explores these within Annex B, and the role of these is summarised below.

5.255 There is synergy with Scotland's **updated Climate Change Plan** in relation to the positive effects identified for **climate change mitigation**, **adaptation** through the delivery of actions supporting both of these. Positive cumulative effects are noted for **biodiversity, flora and fauna** from the updated Climate Change Plan through the delivery of nature-based solutions. This is also strongly reflected through National Planning Framework 4.

5.256 The **Just Transition Plans** reflect the need for a fair distribution of costs and benefits associated with climate resilience measures, and to reduce the inequality of those least able to pay being more vulnerable to the impacts of climate change. The sector and regional Just Transition Plans will play a key role in the future in contributing to the delivery of positive effects for **population and human health,** as identified within the assessment of SNAP3. Many of the actions that support population and human health are also relevant to **material assets**, through the protection of property and infrastructure which people rely on, bringing additional benefits.

5.257 The forthcoming **Flood Resilience Strategy** will further contribute to the positive environmental effects for water, population and human health and material assets, and biodiversity, flora and fauna.

5.258 The **Scottish Biodiversity Strategy** sets out clearly the role of biodiversity in contributing to climate change mitigation and adaptation, further supporting the positive effects outlined within SNAP3.

5.259 Through the **Approach to Climate Change Adaptation and Resilience by Transport Scotland**, adaptation and resilience of the transport sector has strong synergies with the positive effects identified for population and human health, alongside the direct benefits for material assets.

5.260 The actions being taken forward by **Public Health Scotland** and **NHS Scotland** ensure that health and equity are embedded in climate change action. This provides strong synergy with the positive effects identified for population and human health, whilst also contributing to positive management of material assets through the protection of the health service estate and infrastructure.

5.261 Adaptation and resilience in land use is reflected through the **Vision for Agriculture** and Scotland's third **Land Use Strategy**. Actions within these exemplify how our **landscapes** will change in the future, in response to our changing climate **mitigation** and **adaptation** needs. They further highlight the role of adaptation in supporting population and human health, through supporting the rural economy and communities.

5.262 The **National Strategy for Economic Transformation** reinforces the role of nature-based solutions to climate adaptation, and the actions needed to ensure future economic resilience to climate change. These actions support the nature-based solutions outlined under Outcome 1, and also bring benefits for **population and human health** through ensuring the resilience of business, associated goods and services and the contribution of employment to health and wellbeing.

5.263 Cutting across achieving adaptation actions which support all of the SEA objectives is the wider work being undertaken by the Scottish Government on **behaviour**, which will help to support implementation of many of the adaptation actions which are required. An important synergy with achieving the adaptation actions is the role of ensuring there are appropriate **skills** within the workforce to implement these. The Scottish Government also recognises that climate adaptation will impact across many sectors, with impacts on upskilling and training needs, and flexibility in business models to support climate resilience. The wider support for these, has positive impacts on **population and human**

health. The Scottish Government is also working to address the potential skills gap in our transition to a climate resilient Scotland. This supports the achievement of all of the SNAP3 outcomes, and has particular benefits for population and human health.

5.264 There is also recognition of the role of culture in supporting climate change adaptation, drawing on both our understanding of the threats to cultural heritage, but also through the role of culture in providing creative solutions and delivering messages on climate change adaptation action.

5.265 The Scottish Government also recognises the need for investment in adaptation in order to achieve future benefits, in particular through the development of new infrastructure. This impacts particularly on **material assets** through increasing the development of some assets and increasing their resilience. Actions by the Scottish Government are addressing barriers to private investment in adaptation which will help to deliver many of the actions outlined, and secure the delivery of the benefits identified.

Chapter 6

Mitigation and Enhancement

6.1 The 2005 Act states that 'the measures envisaged to prevent, reduce and as fully as possible offset any significant adverse effects on the environment of implementing the plan or programme' are outlined within the Environmental Report. These measures are often referred to as mitigation measures. The following text summarises the mitigation measures identified from the assessment.

6.2 No significant negative environmental effects have been identified, however a range of enhancement measures are described in relation to the actions below.

Outcome One: Nature Connects (NC): Nature connects across our lands, settlements, coasts and seas

Objective: Nature based solutions (NC1)

Mitigation and enhancement

- Actions which promote nature-based solutions as part of landscape scale interventions and support naturally functioning coastal landforms should also include those which consider the protection of the historic environment.

- Landscape-scale interventions focussed on creating new economic opportunities should consider their effects on the historic environment or the setting of heritage assets and mitigate these.

Objective: Development planning (NC2)

Mitigation and enhancement

- Reference could be included on other ways in which additional evidence gathering can support Local Authorities in preparing Local Development Plans.
- Include consideration and mitigation requirements for actions which enhance to green/blue infrastructure through woodland/tree planting

Objective: Nature Networks (NC3)

Mitigation and enhancement

- No mitigations or enhancements.

Objective: Marine Ecosystems and the Blue Economy (NC4)

Mitigation and enhancement

- Actions which promote nature-based solutions as part of landscape scale interventions and support naturally functioning coastal landforms should also include those which consider the protection of historic environment.

- Landscape-scale interventions focussed on creating new economic opportunities should consider their effects on the historic environment or the setting of heritage assets and mitigate these.

Objective: Natural Carbon Stores and Sinks (NC5)

Mitigation and enhancement

- No mitigations or enhancements.

Outcome Two: Communities (C)

Objective: Place Based Collaboration (C1)

Mitigation and enhancement

- No mitigations or enhancements.

Objective: Community and Individual support (C2)

Mitigation and enhancement

- No mitigations or enhancements.

Objective: Preparation and Response (C3)

Mitigation and enhancement

- The actions for general resilience refer to extreme weather events, but don’t specify the potential impacts of drought on vulnerable rural and island communities, which typically rely on private water supplies or have a greater reliance on rainfall to maintain water supply.

Objective: New and existing Buildings (C4)

Mitigation and enhancement

- Provide requirements supporting protections to biodiversity in both the design of new buildings and regarding adaptation and retrofitting of existing and traditional buildings.
- Provide requirements supporting the protection of landscape and the historic environment regarding the design and adaptation of both new buildings and existing and traditional buildings.

Objective: Culture and Historic Environment (C5)

Mitigation and enhancement

- No mitigations or enhancements.

Outcome Three: Public Services (PS)

Objective: Public Service providers (PS1)

Mitigation and enhancement

- No mitigations or enhancements.

Objective: Accessing Public Services (PS2)

Mitigation and enhancement

- No mitigations or enhancements.

Objective: Power Assets and the Energy System (PS3)

Mitigation and enhancement

- No mitigations or enhancements.

Objective: Transport system (PS4)

Mitigation and enhancement

- No mitigations or enhancements.

Objective: Water, Sewerage and Drainage (PS5)

Mitigation and enhancement

- No mitigations or enhancements.

Outcome Four: Business and Industry (B)

Objective: Increasing business awareness of climate risks (B1)

Mitigation and enhancement

- No mitigations or enhancements.

Objective: Farming, Fishing and Forestry (B2)

Mitigation and enhancement

- Actions regarding tree planting should include consideration and mitigation of any potential adverse impacts on landscape character, historic environment, archaeology and the setting of heritage assets.

Objective: Adaptation Innovation (B3)

Mitigation and enhancement

- No mitigations or enhancements.

Objective: Economic Development (B4)

Mitigation and enhancement

- No mitigations or enhancements.

Outcome Five: International Action (IA)

Objective: Vulnerable Communities (IA1)

Mitigation and enhancement

- No mitigations or enhancements.

Objective: International advocacy (IA2)

Mitigation and enhancement

- No mitigations or enhancements.

Mitigation and enhancement

- This objective only makes reference to the Climate change COP. The objective could include reference to the other COP that also support Scotland's adaptation to climate change, such as the COP for biodiversity.

Objective: A global hub for adaptation research (IA3)

Mitigation and enhancement

- No mitigations or enhancements.

Chapter 7

Monitoring

7.1 Monitoring significant environmental effects is a statutory requirement within the 2005 Act. Monitoring seeks to ensure that plans avoid generating unforeseen adverse environmental effects and enables the responsible authority to undertake appropriate remedial action.

7.2 Annex 3 of SNAP3 sets out the proposed approach to the Adaptation Monitoring Framework. This includes annual reports to the Scottish Parliament which will include an agreed set of quantitative indicators to monitor the Adaptation Plan's objectives. To track Scotland's longer-term adaptation outcomes, the Scottish Government plan to publish a baseline at the start and again at the end of the Adaptation Plan's 5-year period to track trends in resilience.

7.3 The proposed approach to monitoring offers key opportunities to incorporate the monitoring of unforeseen environmental effects. As the Scottish Government develops the detail of the SNAP3 monitoring, this should reflect environmental indicators which reflect the SEA topics. The proposals for monitoring will be addressed and further outlined within the post adoption statement at the end of the SEA process.

Chapter 8

Conclusion and Next Steps

Conclusion

8.1 The draft SNAP3 is identified as delivering a range of significant environmental effects which support climate change adaptation.

8.2 The draft environmental report will be subject to consultation as set out in Chapter 1 of this document.

8.3 Following the consultation period, the consultation responses will be analysed, and Scottish Government will further develop the content of SNAP3. The Scottish Government will then finalise and publish SNAP3. After SNAP3 is adopted, a Post Adoption Statement will be produced. This Statement will set out how the SEA and the views received in the consultation process have been taken into account.

Next steps

8.4 Table 8.1 sets out an indicative timetable for the development of draft SNAP3 and associated SEA process.

Table 8.1: Indicative timetable

Indicative timing	Development of SNAP3	Stage of the SEA
January – April 2024	Publish and consult on SNAP3	Consult on the Environmental Report for a period of 10 weeks
Summer 2024	Analysis of responses on draft SNAP3 and further development of content	Analysis of responses on the Environmental Report
Summer/autumn 2024		Additional SEA of additional plan content (if required)
Autumn2024	Finalise and publish SNAP3	Produce and publish the SEA Post Adoption Statement for SNAP3

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