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The Scottish Government
Riaghaltas na h-Alba

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XX COMMONWEALTH GAMES
SCOTLAND

Rob Gibson
Convener
Rural Affairs, Climate Change and Environment Committee
Scottish Parliament
Edinburgh
EH99 1SP

16 March 2015

Dear Rob

In advance of the Rural Affairs, Climate Change and Environment Committee's consideration of biodiversity this month, I am pleased to attach a final pre-publication draft of 'Scotland's Biodiversity – a Route Map to 2020'. This document complements the '2020 Challenge for Biodiversity' and sets out the priority projects which the Scottish Government and a wide range of partners are taking forward to help deliver the Challenge and to continue the work to improve the state of nature in Scotland.

The Route Map identifies six 'Big Steps for Nature' and a number of priority projects which focus on collaborative work which will deliver benefits for biodiversity and help towards meeting the Aichi goals and targets. The document has been prepared by Scottish Natural Heritage as lead author, with input from a range of organisations which are members of the Delivery and Monitoring Group (which reports to the Scottish Biodiversity Committee which I chair). The document will be updated to record progress and capture new activities as these are developed.

In view of the Committee's consideration of this topic, I felt it would be helpful to share the document with you prior to publication, to help inform your evidence sessions and to offer the Committee an opportunity to provide comments before I publish the Route Map early in April.

I am looking forward to discussing the 2020 Challenge and the Route Map when I meet the Committee later this month.

Kind regards

AILEEN MCLEOD

Final pre-publication draft

Scotland's Biodiversity – a Route Map to 2020

1 Introduction

In 2013, we published *The 2020 Challenge for Scotland's Biodiversity*. It updated and complements the Scottish Biodiversity Strategy, *It's in Our Hands* (2004), to take account of the Aichi goals and targets and to set out the major steps we need to take in order to improve the state of nature in Scotland.

Our awareness of the importance, value and fragility of nature is growing year on year. Through an impressive body of evidence we are building up a clearer picture of what needs to be done to care for and restore biodiversity. The work needed to improve matters is complex and challenging. The Route Map intentionally is not a catalogue of all activity that is underway or planned, but rather it sets out 6 'Big Steps for Nature' and a number of priority projects which focus on collaborative work which the Scottish Government and a wide range of partners are taking forward to help deliver the 2020 Challenge and to improve the state of nature in Scotland.

Many of our habitats and wildlife are internationally important. Scotland's peatlands, mountain landscapes, coastal cliffs and seas, machair and a diversity of woodland ecosystems are exceptional by European standards. These support a fantastic range of species, as well as being key assets for public health and wellbeing. We want to improve the state of nature across Scotland and to ensure that many more people draw on its many benefits.

As set out in the 2020 Challenge, our well-being and prosperity depends on the benefits that biodiversity provides. Forests, meadows, rivers, saltmarshes and bogs in healthy condition provide clean water, food, fuel, storm protection, minerals and flood control. Nature underpins all of this, and of course is important in its own right. Regular contact with wildlife provides many health benefits, enables our children to enjoy learning, and helps bring people together. We need to protect and enhance nature to secure these benefits now and into the future.

Scotland's Economic Strategy (2015) states that '*Protecting and enhancing this stock of natural capital, which includes our air, land, water, soil and biodiversity and geological resources is fundamental to a healthy and resilient economy*'.

The Natural Capital Asset Index provides an overview of the state of Scotland's natural assets (based on seven broad ecosystems), and is founded on an assessment of their area and quality. Between the 1950s and 1990s there was a decline in Scotland's natural capital, with the greatest rate of decline between the 1960s and 1970s. Since 1990 there has been a slight recovery, with freshwaters, woodland, coast and urban greenspace showing the greatest improvement. Moorland, grassland and cropland have not fared so well, primarily due to changes in forestry and farming practices.

Understanding the decline in the natural capital of Scotland, alongside an analysis of biodiversity action undertaken to 2010, has allowed us to identify action needed to improve matters. We have devised a range of biodiversity trends and indicators which provide us with the evidence base on the pressures biodiversity is facing, and specific work required.

Government policy and actions are critical, including the Common Agricultural Policy (CAP) reform, the greening of Pillar 1 and the agri-environment measures on offer though the next Scottish Rural Development Programme (SRDP), which are targeted to benefit priority species in greatest need of conservation action. These provide opportunities for improved farming for the environment and for biodiversity. The Climate Change Adaptation Programme, the National Performance Framework 3, and the Land Use Strategy also provide clear policy guidance on biodiversity matters. Other important strategies include the Scottish Soil Framework, which aims to promote the sustainable management and protection of soils consistent with economic, social and environmental needs. The Water Framework Directive and River Basin Management Plans provide an important basis for multi-benefit coordinated action.

Much valuable work is already underway and is planned by Scotland's National Parks, NGOs, public agencies, Local Biodiversity Action Partnerships, Local Authorities (through Local Biodiversity Action Plans), businesses, land managers and committed individuals. Much of this work is undertaken on a partnership and collaborative basis, which we wish to deepen through some of the priority projects highlighted in this Route Map.

Many landscape scale projects, which involve communities, land managers and other partners, are already working to address biodiversity issues and to deliver socio-economic benefits. This work operates across much of Scotland; from projects in our National Parks to Coigach-Assynt in the far north, and from the Inner Forth and the Central Scotland Green Network (CSGN) in the central belt to the Galloway and South Ayrshire Biosphere. Beyond this, there are many important urban-based projects supporting biodiversity in our towns and cities as well as work focused at a catchment scale.

Some of the key work is concentrated on particular habitats and species. There is a huge range of exciting work on species conservation, involving waders, black grouse, red squirrels, wildcats and freshwater pearl mussels, to name a few. The special communities of mosses, liverworts, fungi and lichens are getting more attention, which is appropriate given their international importance. Indeed, across Scotland thousands of projects are underway, ranging in scale from restoration of tiny raised bogs and ponds through to ambitious woodland and river restoration schemes. Research projects, many involving hundreds of volunteers, provide a wealth of data on almost every part of Scotland, with basking sharks, seabird colonies, birds of prey, amphibians and reptiles, rare plants and fungi and literally hundreds of species figuring prominently in reports.

All of this work provides more places and opportunities for increasing numbers of people to experience and enjoy biodiversity. In 2014, over 10 million people visited the two Scottish National Parks, and more than 12,000 young people were involved in practical biodiversity conservation in Scotland through the John Muir Award. RSPB has 1,700 active volunteers helping look after nature on their

reserves, and 9,000 school children experienced outdoor learning. These are impressive statistics.

Much of the action underway across Scotland to tackle the decline in biodiversity is being captured in Biodiversity Duty reports and the Biodiversity Delivery Agreements that many organisations are currently developing.

This is the first version of the Route Map. We shall update it to report on progress and to set out further work that is underway or planned. We have governance structures in place, with the Ministerially-chaired Scottish Biodiversity Committee providing leadership and the Delivery and Monitoring Group driving delivery and monitoring progress.

2 The key pressures on biodiversity

Work at the global, European, national and regional levels is clarifying the pressures we have to deal with in relation to biodiversity loss, we have identified the following seven as the most critical for Scotland:

- **Pollution** – from industry, agriculture and road traffic, which impacts on waterways, uplands, air quality and sensitive habitats across Scotland;

- **Land use intensification and modification –** leads to a reduction of diversity, quality and connectivity of landscapes and habitats. Across the uplands this results from increased grazing pressure, and in the past, forestry; in the lowlands it is primarily through agricultural intensification, and more recently increased grazing, with housing development a significant localised pressure in some areas;

- **Spread of invasive species and wildlife disease** – much of this has arisen from a growing global trade of plants and animals;

- **Lack of recognition of the value of nature** – Currently, the vital benefits that healthy stocks of nature, or 'natural capital', provide to society are not fully recognised or appreciated and therefore are not sufficiently considered in decision making;

- **Disconnection with nature** – many people in society are disconnected with nature and therefore undervalue its contribution to their well-being and prosperity, and to wider society;

- **Climate change** – is causing a shift in weather patterns which are affecting nature across Scotland. In the seas warming, acidification and sea level rise are becoming evident, and wetter conditions on land, especially in the west are predicted; and

- **Marine exploitation** – mainly in the form of some commercial fisheries and fishing, which have profoundly changed the abundance and resilience of some species, such as cod, and altered marine habitats.

We recognise the importance of working to address these pressures, including the need to adopt an ecosystem approach. This involves bringing the stocks of natural capital into good health, and appreciating the services provided by nature in order to improve management through collaborative work.

3 Organising and prioritising work

The 2020 Challenge for Scotland's Biodiversity set out Outcomes and Key Steps for each of its seven chapters. These are best met through taking six 'Big Steps for Nature'. Under each of these we have identified a suite of priority projects. These focus on delivering benefits for biodiversity on the ground – they are practical, collaborative and readily understood.

3.1 Six Big Steps for Nature

The six steps are as follows:

1. **Ecosystem restoration** – to reverse historical losses of habitats and ecosystems, to meet the Aichi target of restoring 15% of degraded ecosystems;

2. **Investment in natural capital** – to ensure the benefits which nature provides are better understood and appreciated, leading to better management of our renewable and non-renewable natural assets.

3. **Quality greenspace for health and education benefits** – to ensure that the majority of people derive increased benefits from contact with nature where they live and work;

4. **Conserving wildlife in Scotland** – to secure the future of priority habitats and species;

5. **Sustainable management of land and freshwater** – to ensure that environmental, social and economic elements are well balanced; and

6. **Sustainable management of marine and coastal ecosystems** – to secure a healthy balance between environmental, social and economic elements.

3.2 Priority projects

We have identified Priority Projects under each of the big steps, though some could sit under several of these. These projects require collaborative, partnership working, and are part of a rolling programme which will be updated annually.

Big Steps for Nature and Priority Projects.

BIG STEP 1: Ecosystem Restoration

2020 Challenge Outcome: Scotland's ecosystems are restored to good ecological health so that they provide robust ecosystem services and build our natural capital

Priority Project 1: Restoration of Peatlands

Aim: Restore peatland condition and function in order to generate benefits through ecosystem services; carbon sequestration, carbon storage, water quality, flood management and more abundant nature.

Target: Ambitious peatland restoration programme underway, contributing to the EU 15% ecosystem restoration target.

On-going work

- Restore peatland and sequester carbon through 107 peatland management agreements and grants awarded across Scotland covering 5,100 ha.
- Flow Country Peatland Restoration - establish an international benchmark for good practice.

Planned work

- *National Peatland Plan* published in 2015 and implementation begun.
- Peatland restoration demonstration - 15 events for land managers and communities across Scotland.

Priority Project 2: Restoration of native woodland

Aim: Improve the condition and extent of existing native woodlands and further increase new woodland planting.

Target:

- Increase the amount of native woodland in good condition (upwards from 46% as identified by the Native Woodland Survey of Scotland).
- 3,000 to 5,000ha of new woodland creation per year.
- Restore approximately 10,000 ha of native woodland into satisfactory condition in partnership with private woodland owners through Deer Management Plans.

On-going work

- Provision of grants, information, promotional events and training
- Conservation management on the National Forest Estate.
- Development of Deer Management Plans with public interest targets to contribute to the overall aim of native woodland restoration.

Planned work

- Implement *Scotland's Wild Deer: A National Approach.*
- Establish further mechanisms for lowland deer management.
- Atlantic Woodland Restoration - through rhododendron removal and conservation management (Life funding bid in progress).

Priority project 3: Restoration of Freshwaters

Aim: To secure good ecological status for more rivers and lakes in Scotland and thereby secure biodiversity gains and a range of ecosystem services; through addressing diffuse pollution, invasive non-native species, physical modifications as well as riparian and wider-catchment land management issues.

Target: Achieve agreed ecological water quality objectives under the Water Framework Directive of river and lake water bodies and to contribute to meeting conservation objectives (including Natura 2000 sites) through scoping improvements to physical modifications.

On-going work

- Development and implementation of two River Basin Management Plans for the 2nd cycle (2015-2021) – delivering Water Framework Directive objectives and associated biodiversity benefits.
- Physical restoration of rivers in priority catchments as part of the 'Pearls in Peril' Life Project will deliver substantial biodiversity benefits and restore river function.

Planned work

- Develop a community-based, riparian invasive non-native species (INNS) project over approximately 29,500 square km of Northern Scotland. Development of catchment scale long-term control with a focus on freshwaters will reduce the economic, social and environmental impacts of INNS in the long term (HLF stage 1 bid submitted).
- Focused measures on priority catchments for diffuse pollution with associated biodiversity benefits.
- Physical restoration of 4 pilot catchments with associated biodiversity benefits.
- Contribute to IUCN *River Restoration and Biodiversity* project.

BIG STEP 2 – Investment in Natural Capital

2020 Challenge Outcome: Natural resources contribute to stronger sustainable growth in Scotland, and we increase our natural capital to pass on to the next generation

Priority Project 4: Securing economic and social benefits from, and investment in, natural capital.

Aim: Economic and social benefits from improving Scotland's natural capital are demonstrated, and investment secured through new or existing instruments.

Target: Businesses are more aware of their reliance on Scotland's natural capital, and more investment is being made in building natural capital.

On-going work:

- Promoting the Woodland Carbon Code to attract investment in woodland creation.
- Developing the Peatland Code as a framework for investing in peatland

restoration.
- Developing the Natural Capital Asset Index (NCAI) as a means of assessing Scotland's natural capital and the sustainability of the Scottish economy.

Planned work:
- Identify opportunities for new investment by business in green infrastructure, especially in the CSGN area.

BIG STEP 3 - Quality greenspace for health and education benefits

2020 Challenge Outcome: Improved health and quality of life for the people of Scotland, through investment in the care of green space, nature and landscapes.

Priority Project 5: More people experiencing and enjoying nature

Aim: Improve levels of regular participation in outdoor recreation, volunteering and learning by all of Scotland's people.

Target: Increase regular visits and active travel in greenspace through improved infrastructure, information, and campaigns, and the provision of activities and events.

On-going work
- Supporting the better provision and quality of greenspace through development planning and place-making.
- Delivering national and local participation campaigns, events and activities and outreach work targeted at under-represented groups.
- Developing more opportunities for the public to engage in volunteering and citizen science through Scotland Counts and SEWeb.

Planned work
- Better provision of information on opportunities to enjoy the outdoors, including the development of a national web portal to the natural environment.
- Improve provision of greenspace in disadvantaged areas of urban Scotland through green infrastructure projects funded through the Scotland's 2014-2020 Structural Funds Programme (funding bid in progress).
- Delivering the National Walking and Cycling Network and promoting its use by the public.

Priority Project 6: Taking Learning Outdoors

Aim: Increase Secondary and Primary schools' access to greenspace and nature for outdoor learning.

Target: 100 schools in the 20% most disadvantaged areas across Scotland have access to quality greenspace for outdoor learning.

On-going work
- Providing outdoor learning information and opportunities in National,

Regional and Local Parks, Nature Reserves, and the National Forest Estate.
- Supporting teachers through Teaching in Nature, Forest Schools and similar programmes to ensure they are able to deliver outdoor learning to children and young people.
- Develop and improve greenspace provision and opportunities for outdoor learning close to schools.

Planned work
- Develop and improve greenspace provision and opportunities for outdoor learning close to schools in the most disadvantaged communities in Scotland.

Priority Project 7: Developing Scotland's *natural* health service

Aim: NHS Health Boards to promote health benefits from physical outdoors activity and contact with nature, with green exercise routinely prescribed by health professionals as part of the physical activity pathway.

Target: Improve greenspace quality and use on at least one hospital or health care facility in each NHS health board in mainland Scotland.

On-going work
- Developing and promoting a green exercise tool-kit for use by the health and environment sectors.
- Delivering a NHS Greenspace Demonstration Project; providing quality greenspace for use by patients, visitors and staff for treatment, recovery, recreation and relaxation.

Planned work
- Deliver 2nd phase of the NHS Greenspace Demonstration Project to complete mainstreaming of greenspace provision and use on the NHS estate.
- Support better mapping, provision and use of green exercise opportunities as part of three area-based initiatives with health boards and local authorities to increase physical activity levels, improve mental health and tackle health inequalities.

BIG STEP 4 – Conserving wildlife in Scotland

2020 Challenge Outcome: The special value and international importance of Scotland's nature and geodiversity is assured, wildlife is faring well and we have a highly effective network of protected places

Priority Project 8: Protected Areas in good condition

Aim: Ensure protected sites are under good conservation management.

Target: At least 80% of designated 'features' in favourable condition by 2016.

On-going work
- Focusing action on those sites that are in most need of effective conservation management.
- Undertake work to ensure that at least 18% of land and freshwater is under

conservation designation.

Planned work

- Work towards improving the condition of protected sites in the longer term.

Priority Project 9: Conservation of priority species

Aim: Deliver focused action for priority species in Scotland.

Target: Six high profile wildlife projects underway in 2015, with a further suite of projects to be developed (e.g. concerned with restoring populations of curlew, corncrake, corn bunting, water vole, pearl-bordered fritillary, great yellow bumblebee).

On-going work

- Freshwater pearl mussel conservation: protecting, restoring and securing populations in 19 SACs in Scotland (and one each in England and Wales).
- Langholm Moorland Demonstration Project – sustainable management of red grouse, habitat, hen harriers and other wildlife.
- Increasing abundance of ground nesting birds through the eradication of North American mink on the Outer Hebrides.
- Removing black rats, and other remedial work, on Shiant islands to improve success of breeding seabirds.
- Under PAWS (Partnership Against Wildlife Crime Scotland), implement action plan for hen harriers involving intelligence sharing, enforcement and awareness raising to combat wildlife crime.
- Saving Scotland's Red Squirrels Project – collaborative work with many landowners to safeguard the red squirrel population in stronghold ranges.

Planned work

- South Scotland golden eagle reinforcement project initiated in 2015.
- Wildcat action plan implemented.
- Publish and implement a species framework for Scotland, enabling the setting of conservation and management priorities.
- Publish Pollinator Strategy for Scotland.
- Publish Plant Health Strategy for Scotland.

BIG STEP 5 – Sustainable management of land and freshwater

2020 Challenge Outcome: Nature is faring well and ecosystems are resilient as a result of sustainable land and water management

Priority Project 10: Improving ecological connection

Aim: Improve habitat and species resilience, contribute to wider ecosystem services (such as improved natural flood management and reducing diffuse pollution) and contribute to the socio-economics of central Scotland.

Target: Improve connectivity between habitats and ecosystems.

On-going work

- Habitat management to support connections for eight sites within the CSGN area through EcoCo Life project.

Planned work

- Develop a national ecological network to enable characterisation of the nature of Scotland, and to help with the identification of priority areas for action on habitat restoration, creation and protection.
- Develop integrated habitat 'opportunity' mapping for central Scotland and identify delivery mechanisms.
- Provision of green infrastructure in central Scotland through Scotland's 2014-2020 Structural Funds Programme (ERDF application in progress).

Project Priority 11: Sustainable land management

Aim: Support sustainable land management under the Common Agricultural Policy (CAP) and establish a network of demonstration sites in which ecosystem health is improved alongside agricultural production.

Target: Promotion of measures to support biodiversity under CAP. A suite of sites demonstrating good practice aimed at supporting wildlife.

On-going work.

- Targeted support for sustainable land management practices under SRDP Agri-Environment Climate and Forestry Grant Schemes.
- Support for biodiversity on arable farms through the Ecological Focus Areas CAP greening requirement, and increased protection for hedgerows and watercourses under cross compliance.
- The Wildlife Estates Scotland (WES) Initiative – encouraging best practice and demonstrating how sustainable game and wildlife management can deliver multiple benefits, including wildlife conservation, and wide society and rural community benefits.
- Demonstration Farms - including Leaf Farms and Climate Change focus Farms, plus research and teaching farms run by Scotland's Rural College (SRUC) and James Hutton Institute (JHI).

Planned work

- Support for landscape-scale agri-environment management under the new SRDP Environmental Cooperation Action Fund.
- Promotion of agri-environment and sustainable farming practices through the SRDP Farm Advisory Service and Scottish Rural Network.
- Seeking EC approval to implement CAP greening through a certification scheme from 2016, including new nutrient efficiency measures on grassland farms.
- Expand network of demonstration farms which support biodiversity.
- Develop a network of arable farms to demonstrate ways in which farming can sustain multiple benefits, and reverse the declines in vascular plants and specialist groups of invertebrates and birds.

BIG STEP 6 - Marine and Coastal ecosystems restored

2020 Challenge Outcome: Scotland's marine and coastal environments are clean, healthy, safe, productive and biologically diverse, meeting the long-term needs of the people and nature

Priority Project 12: Increase environmental status of our seas

Aim: establish effective protection and management of nature in Marine Protected Areas and safeguard priority marine features.

Target: 10% of Scotland's seas to be incorporated in nature conservation Marine Protected Areas.

On-going work

- Developing the evidence base through setting and delivering surveillance/ monitoring strategy that will allow authoritative reporting of state and progress.
- Completing the suite of MPAs (including the additional NATURA sites) and agreeing and delivering measures for their effective management.
- Putting in place Regional Marine Plans that incorporate provision for decision making that promotes ecological coherence between protected areas and safeguards priority marine features.

Table 1 summarises the priority projects that are underway and their contributions to the Big Steps for Nature, the Scottish Biodiversity Strategy outcomes and key steps, to addressing pressures, and to delivering against the Aichi targets.

3.3 Supporting Work

Work is needed to support these projects, improving knowledge and effectiveness through gathering and presenting information to aid decision making. This is being undertaken across agencies, NGOs and businesses, and examples include:

- **Natural Capital Asset index (NCAi)** used to inform decision making;
- **Ecosystem Health Indicators** published on Scotland Environment website (SE Web) to inform local decision making and help set targets and priorities for action;
- **A new habitat map** of Scotland based on the pan-European EUNIS-Annex I classification by 2019;
- **Citizen science:** an increase by 10% in the number of people providing data and information on the state of nature and awareness-raising of nature benefits;
- **Carbon rich soil map** published in 2015 to help inform decision making;
- **INNS prevention**: Preventing the introduction and spread of INNS by improving biosecurity and surveillance, and responding quickly to control new outbreaks;
- Raising **awareness amongst businesses** through the Scottish Forum on Natural Capital and exploring new opportunities for investment; and
- With Young Scot explore opportunities to **engage young people** in delivery of the 2020 Challenge.

Geographically-focused work

A range of biodiversity-related work focussed on particular places and areas in Scotland, often working at a landscape scale and on a collaborative basis, has been in place for many years and will continue to be important. Examples include the work of Scotland's National Parks (through Cairngorms Nature and Wild Park 2020), on Scotland's National Forest Estate, the Royal Society for the Protection of Birds' (RSPB) 'Futurescapes', the Scottish Wildlife Trust's (SWT) 'Living Landscapes' and the Galloway and South Ayrshire Biosphere. Other relevant initiatives include the early work to pilot collaboration on priority catchments where a focus of activity, particularly by government agencies, could deliver multiple benefits; and the Land Use Strategy Pilots in the Scottish Borders and Aberdeenshire.

Examples of focused action on priority species and habitats include:

- Cairngorms National Park: wading birds, invertebrates, Scottish wildcats and Capercaillie, peatland restoration, and native woodland, peatland and moorland management;
- Loch Lomond and The Trossachs National Park: red squirrel, black grouse, peatlands, woodlands and focused action on invasive non-native species such as rhododendron, Japanese knotweed and American Skunk cabbage.
- National Forest Estate: protecting and conserving priority habitats, tackling invasive species and monitoring key species.
- National Nature Reserves: management and restoration of peatlands, native woodlands and freshwaters; work on priority species; and conserving a wide range of rare and special places for people to enjoy.

4 Measuring and reporting on progress

The 2020 Challenge sets out how Scotland will contribute to the global Aichi targets. Tracking work being done towards 2020 can provide assurance of progress, highlight concerns and inform action. **Annex 1** illustrates how the Scotland and UK biodiversity indicator sets measure progress towards the Aichi targets.

4.1 Scotland's biodiversity indicators

Scotland's Biodiversity Indicators have been developed to monitor changes in our nature and landscapes. They provide evidence of progress towards policy objectives and demonstrate what is actually happening.

Scotland's indicators include a set which link to the 2020 Challenge, these are known as Scotland's biodiversity strategy indicators. These are divided into two sets:

- Scotland's Biodiversity State Indicators and
- Scotland's Biodiversity Engagement Indicators.

Scotland's National Performance Framework also provides a measure of biodiversity through the following indicators:

Visits to the outdoors - Increase people's use of Scotland's outdoors
Conditions of Protected Sites - Improve the condition of protected nature sites
Breeding Birds - Biodiversity: increase the index of abundance of terrestrial breeding birds

Together these provide the evidence that illustrates Scotland's contribution to the global objectives set out in the Aichi targets.

4.2 UK Biodiversity Indicators

The UK Biodiversity Indicators also provide a measure of Scotland's contribution to global targets. Many of the indicators can be disaggregated to Scotland level. The overall indicator set has been developed to measure the UK's progress towards the Aichi targets. These are also set out in **Annex 1**.

4.3 Scotland Rural Development Programme and CAP Greening

The recently launched SRDP contributes to the delivery and aims of the 2020 Challenge and global biodiversity targets. Projects to measure the impact of SRDP agri-environment measures and CAP greening requirements are currently being developed.

4.4 Measuring the contribution of 2020 Challenge Priority Projects

Priority projects described in the Route Map highlight vital and practical targeted action, for which discrete output/outcome measures will be specified. We will track progress under the auspices of the Delivery and Monitoring Group.

4.5 Ecosystem Health Indicators

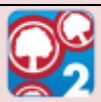
A set of Ecosystem Health Indicators is currently under development to characterise conditions relevant to regional and local-scale delivery, such as at the catchment scale. These will also inform our contribution to some of the global Aichi targets.

In addition to the indicators; and projects detailed above, the growing contribution to knowledge from SEWeb, the National Biodiversity Network (NBN) and Biodiversity Action Reporting System (BARS) will help to monitor progress. Much of this draws on research and survey work by organisations such as the JHI, SRUC, the Royal Botanic Garden Edinburgh, our Universities, and NGOs with a strong research and survey base such as the British Trust for Ornithology, Scottish Ornithologists' Club, Botanical Society for the British Isles and Plantlife Scotland.

Scotland's 2010 assessment concluded that very considerable progress had been made by many people and organisations in caring for and enjoying nature. We have begun work to prepare an annual '2020 Challenge: state of nature' report, which will provide a stock-take on how nature is faring. This will incorporate the results of survey, monitoring and analyses set out under Annex 1. It will draw on a wide range of inputs from those delivering the Route Map, and will provide a one-stop account of progress being made.

This Route Map will guide the collaborative work which will help meet the aims of the 2020 Challenge and the Aichi targets over the next five years.

Annex 1. Convention on Biological Diversity – Aichi Targets and Indicators
This summary of the current status of indicator development is a mix of metrics developed at the UK and, where data permit, the Scotland scales.

	**Awareness increased** *By 2020, at the latest, people are aware of the values of biodiversity and the steps they can take to conserve and use it sustainably.*	
	UK	A1 Awareness understanding and support for conservation A2 Taking action for nature: volunteer time spent in conservation
	Scotland	E1 Attitudes to biodiversity E3 Visits to the outdoors
	**Biodiversity values integrated** *By 2020, at the latest, biodiversity values have been integrated into national and local development and poverty reduction strategies and planning processes and are being incorporated into national accounting, as appropriate, and reporting systems.*	
	UK	A3 Value of biodiversity integrated into decision making – under development
	**Incentives reformed** *By 2020, at the latest, incentives, including subsidies, harmful to biodiversity are eliminated, phased out or reformed in order to minimize or avoid negative impacts, and positive incentives for the conservation and sustainable use of biodiversity are developed and applied, consistent and in harmony with the Convention and other relevant international obligations, taking into account national socio economic conditions*.	
	UK	B1a Area of land in agri-environment schemes B1b Agriculture and forest area under environmental management schemes
	Scotland	N7 Land and sea of recognised natural heritage importance
	**Sustainable consumption and production** *By 2020, at the latest, Governments, business and stakeholders at all levels have taken steps to achieve or have implemented plans for sustainable production and consumption and have kept the impacts of use of natural resources well within safe ecological limits.*	
	UK	A3 Value of biodiversity integrated into decision making – under development A4 Global biodiversity impacts of UK economic activity/ sustainable consumption A5 Integration of biodiversity considerations into business activity – under development
	**Habitat loss halved or reduced** *By 2020, the rate of loss of all natural habitats, including forests, is at least halved and where feasible brought close to zero, and degradation and fragmentation is significantly reduced*.	
	UK	C3a Status of habitats of European importance C5 Birds of the countryside and at sea
	Scotland	S03 Abundance of terrestrial breeding birds S04 Abundance of wintering waterbirds S05 Abundance and productivity of breeding seabirds S11 Condition of notified habitats

	**Sustainable management of marine living resources** *By 2020 all fish and invertebrate stocks and aquatic plants are managed and harvested sustainably, legally and applying ecosystem based approaches, so that overfishing is avoided, recovery plans and measures are in place for all depleted species, fisheries have no significant adverse impacts on threatened species and vulnerable ecosystems and the impacts of fisheries on stocks, species and ecosystems are within safe ecological limits.*	
	UK	B2 Sustainable fisheries (to be replaced)
	Scotland	NPI Improve the state of Scotland's marine environment (to be replaced)
	**Sustainable agriculture, aquaculture and forestry** *By 2020 areas under agriculture, aquaculture and forestry are managed sustainably, ensuring conservation of biodiversity.*	
	UK	B1a Area of land in agri-environment schemes B1b Agriculture and forest area under environmental management schemes
	Scotland	N7 Land and sea of recognised natural heritage importance
	**Pollution reduced** *By 2020, pollution, including from excess nutrients, has been brought to levels that are not detrimental to ecosystem function and biodiversity.*	
	UK	B5a Pressure from air pollution B5b Marine pollution B7 Surface water status
	Scotland	
	**Invasive alien species prevented and controlled** *By 2020, invasive alien species and pathways are identified and prioritized, priority species are controlled or eradicated, and measures are in place to manage pathways to prevent their introduction and establishment*	
	UK	B6 Pressure from invasive species
	Scotland	S17 Invasive non-native species 1950s – 2001
	**Pressures on vulnerable ecosystems reduced** *By 2015, the multiple anthropogenic pressures on coral reefs, and other vulnerable ecosystems impacted by climate change or ocean acidification are minimized, so as to maintain their integrity and functioning.*	
	UK	B3 Climate change adaptation – under development B4 Pressure from climate change – spring index B5b – Marine pollution
	Scotland	N4 Timing of seasonal events
	**Protected areas increased and improved** *By 2020, at least 17 per cent of terrestrial and inland water, and 10 per cent of coastal and marine areas, especially areas of particular importance for biodiversity and ecosystem services, are conserved through effectively and equitably managed, ecologically representative and well-connected systems of protected areas and other effective area-based conservation measures, and integrated into the wider landscapes and seascapes.*	
	UK	C1 Protected areas
	Scotland	S10 Condition of notified species S11 Condition of notified habitats N7 Land and sea of recognised natural heritage importance

	**Extinction prevented** *By 2020 the extinction of known threatened species has been prevented and their conservation status, particularly of those most in decline, has been improved and sustained.*	
	UK	C3b Status of UK species of European importance C4 Priority species C5 Birds of the countryside and at sea C6 Insects of the countryside – butterflies C7 Plants of the wider countryside C8 Mammals of the wider countryside – bats
	Scotland	S03 Abundance of terrestrial breeding birds S04 Abundance of wintering waterbirds S05 Abundance and productivity of breeding seabirds S06 Vascular plant diversity S08 Terrestrial insect abundance – butterflies S09 Terrestrial insect abundance – moths S10 Condition of notified species S12 Otter
	**Genetic diversity maintained** *By 2020, the genetic diversity of cultivated plants and farmed and domesticated animals and of wild relatives, including other socio-economically as well as culturally valuable species, is maintained, and strategies have been developed and implemented for minimizing genetic erosion and safeguarding their genetic diversity.*	
	UK	C9a Animal genetic resources C9b Plant genetic resources
	**Ecosystems and essential services safeguarded** *By 2020, ecosystems that provide essential services, including services related to water, and contribute to health, livelihoods and well-being, are restored and safeguarded, taking into account the needs of women, indigenous and local communities, and the poor and vulnerable.*	
	UK	Biodiversity and ecosystem services D1a Fish size classes in the North Sea D1b Removal of greenhouse gases by UK forests D1c Pollinating insects
	**Ecosystems restored and resilience enhanced** *By 2020, ecosystem resilience and the contribution of biodiversity to carbon stocks has been enhanced, through conservation and restoration, including restoration of at least 15 per cent of degraded ecosystems, thereby contributing to climate change mitigation and adaptation and to combating desertification.*	
	UK	Biodiversity and ecosystem services D1a Fish size classes in the North Sea D1b Removal of greenhouse gases by UK forests D1c Pollinating insects
	**Nagoya protocol in force and operational** *By 2015, the Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization is in force and operational, consistent with national legislation.*	
	Not yet developed.	

	**National Biodiversity Strategy and Action Plans adopted as a policy instrument** *By 2015 each Party has developed, adopted as a policy instrument, and has commenced implementing an effective, participatory and updated national biodiversity strategy and action plan.*	
	Scotland	2020 Challenge for Scotland's biodiversity
	**Traditional knowledge respected** *By 2020, the traditional knowledge, innovations and practices of indigenous and local communities relevant for the conservation and sustainable use of biodiversity, and their customary use of biological resources, are respected, subject to national legislation and relevant international obligations, and fully integrated and reflected in the implementation of the Convention with the full and effective participation of indigenous and local communities, at all relevant levels.*	
	Not yet developed	
	**Knowledge, improved shared and applied** *By 2020, knowledge, the science base and technologies relating to biodiversity, its values, functioning, status and trends, and the consequences of its loss, are improved, widely shared and transferred, and applied.*	
	UK	E1 Biodiversity for decision making
	Scotland	N1 Information provision
	**Financial resources from all sources increased** *By 2020, at the latest, the mobilization of financial resources for effectively implementing the Strategic Plan for Biodiversity 2011-2020 from all sources, and in accordance with the consolidated and agreed process in the Strategy for Resource Mobilization, should increase substantially from the current levels. This target will be subject to changes contingent to resource needs assessments to be developed and reported by Parties.*	
	UK	E2 Expenditure on UK and international biodiversity

The species indicators are relevant to several Aichi Targets

Relevant targets 	
UK	C5 Birds of the countryside and at sea
Scotland	S03 Abundance of terrestrial breeding birds S04 Abundance of wintering waterbirds S05 Abundance and productivity of breeding seabirds
UK	C6 Insects of the countryside
Scotland	S08 Terrestrial insect abundance – butterflies S09 Terrestrial insect abundance – moths
UK	C7 Plants of the wider countryside
Scotland	S06 Vascular plant diversity
UK	C8 Mammals of the wider countryside – bats
Scotland	S12 Otter