



Llywodraeth Cymru
Welsh Government

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Natural Resources Policy Statement

Contents

Ministerial Foreword	2
1. What is this policy statement for?	3
Figure 1: Plans and Strategies in the Welsh Government’s Natural Resources Department	4
Figure 2: Guide to the statement	6
2. Sustainable Management of Natural Resources	7
2.1 The principles – sustainable management of natural resources	8
2.2 The delivery framework	9
2.3 Biodiversity and resilience of ecosystems duty	10
3. The Key Challenges	11
3.1 Resilient ecosystems, biodiversity decline and climate change	12
Figure 3: Conceptual framework for EU wide ecosystem assessment	13
Figure 4: Why should we care about air pollution?	16
3.2 Poverty and inequality	17
Figure 5: Key challenges for the sustainable management of natural resources	18
4. Emerging priorities and opportunities for the sustainable management of natural resources	19
Figure 6: Our priority areas for action	20
4.1 Building the resilience of our ecosystems	22
4.2 Managing for multiple benefits	23
4.3 Nature-based solutions and maximising our contribution across the well-being goals	24
Figure 7: How are the environment and our health and well-being connected?	26
5. Implementing our priorities and opportunities	27
5.1 Working at the right scale	27
5.2 Supporting vibrant rural communities through landscape scale approaches	28
Figure 8: Soil and climate change	32
5.3 Resilient Urban Communities – the sustainable management of natural resources at a local authority scale	33
5.4 Coastal Locations	37
5.5 Priorities and opportunities at a national scale	38
5.6 Opportunities to unlock and realise potential	38
6. The wider legislative framework	40
6.1 The Planning (Wales) Act	41
6.2 The Historic Environment (Wales) Bill	42
Annex A – Summary from State of the Environment Report	43

Ministerial Foreword



In Wales, we began the journey towards a more integrated approach to the management of our natural resources with the proposals in our 2010 consultation 'A Living Wales'; followed in 2012 with a Green Paper 'Sustaining a Living Wales' and the establishment of Natural Resources Wales. Following on from the ground-breaking Well-being of Future Generations (Wales) Act, the Environment (Wales) Bill provides the legislative framework for the sustainable management of our natural resources as we move forward on our path towards developing sustainably.

Central to this is building resilience into our natural systems and communities so we are able to tackle the challenges we face now and into the future. Taking an integrated approach to the management of our natural resources is fundamental if we are to mitigate and adapt to climate change. Through putting an ecosystem approach on a statutory footing, the Environment (Wales) Bill places international best practice at its heart in addressing the continuing decline in biodiversity. Used well, our abundance of natural resources are a real opportunity to be the foundation for our long term prosperity, providing us with the essentials to drive green growth and support resilient communities.

The purpose of this Natural Resources Policy statement is to start the conversation with our key stakeholders, by providing an explanation of the role of sustainable management of natural resources, illustrating the key challenges and how nature-based approaches can provide a wealth of opportunities and solutions to maximise our contribution across the goals of the Well-being of Future Generations (Wales) Act.

A handwritten signature in black ink that reads "Carl Sargeant". The signature is written in a cursive style.

Carl Sargeant

Minister for Natural Resources

1. What is this policy statement for?

This Natural Resources Policy statement illustrates some of the key challenges, priorities and opportunities for the sustainable management of our natural resources within the Natural Resources portfolio of the Welsh Government ahead of the first statutory National Natural Resources Policy (NNRP), and sets out the relationship with the Well-being of Future Generations (Wales) Act. It is published as a basis for discussion with our partners as work towards the statutory policy, providing a framework for our land-based natural resources policies and plans to follow and develop further, and to inform the implementation of sustainable natural resource management for NRW building the current area trials. During June this year, we published a booklet describing some of the activities of the Natural Resources portfolio, which can be found at: <http://gov.wales/docs/desh/publications/150622-natural-resources-priorities-booklet-en.pdf>. **Figure 1** provides further details on the indicative timescales for strategies and plans that will be taken forward within the Department up to the next Assembly elections.

The NNRP will set out the national priorities in relation to the sustainable management of natural resources as whole – our air, water, land and sea – and will be published in spring 2017 subject to the Environment (Wales) Bill receiving Royal Assent. It will build on this statement to apply across the Welsh Government and draw on a comprehensive statutory State of Natural Resources Report (SoNaRR) to be published by NRW in autumn 2016. The NNRP will point to the Wales National Marine Plan as the means of sustainably managing our marine resources, reflecting the context of the ecosystem approach for Wales' marine area.

Figure 1: Plans and Strategies in the Welsh Government's Natural Resources portfolio

Summer – Winter 2014

- Development of Green Growth Fund announced
- Planning Reform Bill introduced
- Climate change refresh statement and annual report
- Action Plan for the Food & Drink in Wales published
- CAP Pillar 1 decisions published
- Contingency Plan for Exotic Animal Diseases
- Animal Health and Welfare Strategy published
- Launch of Resource Efficient Wales
- Energy Wales Programme Delivery Plan published
- Royal Assent of Agricultural Sector (Wales) Act
- Review of Farming Connect
- Adoption of Shoreline Management Plans
- Consultation on Flood and Coastal Investment Programme
- Announcement of Innovative Finance Coastal Programme for 2018-2021
- Consultation on Nature Recovery Plan
- Review of Designated Landscapes
- Green paper on improving access to land
- Information Hub

Spring – Summer 2015

- Well-being of Future Generations Act
- Planning (Wales) Act
- Animal Health & Welfare Framework – Annual Plan
- Rural Development Programme 2014/20
- Environment Bill introduced
- Code of Good Agricultural Practice published
- Consultation on the energy efficiency strategy
- Launch consultation of Strategic Framework for Agriculture
- Consultation on Review of Waste Strategy
- Consultation in Waste Public Sector Plan
- National Parks review
- Payment for Ecosystem Services Roadmap
- Water Strategy published

Autumn – Winter 2015

- Sustainable Futures Commissioner appointed
- Cross Compliance Regulations introduced
- Nature Fund review
- New Woodlands for Wales action plan



- Departmental conference
- Review of emergency response plans for air pollution and radiological events.
- Nature Recovery Plan published.
- Energy Efficiency strategy published
- Consultation on the Wales National Marine Plan
- River Basin Management Plans published.
- Establish Partnership Group to lead the Strategic Framework for Agriculture



Spring 2016 (and beyond)

- Royal Assent (anticipated) – Environment (Wales) Bill
- Marine Strategy Framework Directive implemented (Dec '16)
- Roll-out of Green Growth Wales
- Launch of Flood & Coastal Investment Programme
- Completion of local quality air review
- Adoption of the Wales National Marine Plan
- Vision for WG Woodland estate
- Commence review of Welsh noise maps and action plan.

Figure 2: Guide to the statement

<p>Chapter 2 – Sustainable Management of Natural Resources</p>	<p>This chapter outlines the definition of the sustainable management of natural resources, and the delivery framework in the Environment (Wales) Bill.</p>
<p>Chapter 3 – Key Challenges</p>	<p>This chapter illustrates the risks to the benefits that our natural resources provide, including the projected impact of climate change.</p>
	<p>We will build on this for the NNRP using the evidence gathered through SoNaRR, including considering the wider, global context. The Future Trends Report will contain predictions of likely future trends in the social, economic, environmental and cultural well-being of Wales.</p>
<p>Chapter 4 – Our Emerging Priorities and Opportunities for the Sustainable Management of Natural Resources</p>	<p>We have identified some emerging priorities and opportunities for the sustainable management of natural resources at a national level which support building the resilience of our ecosystems. These priorities deliver across the multiple challenges, help manage the pressures and threats on our natural resources and illustrate how we can unlock and realise the potential of our natural resources.</p>
	<p>In developing NNRP we will consider further how we can build resilience and manage for multiple benefits, and how nature based solutions which can provide positive and cost effective responses to our key societal challenges and which can maximise our contribution across the well-being goals.</p>
<p>Chapter 5 – Implementing our priorities and opportunities</p>	<p>This chapter illustrates how the priorities and opportunities may be brigaded into different scales for implementation across different stakeholders.</p>
<p>Chapter 6 – The wider legislative framework</p>	<p>This chapter describes the detailed relationship to the Well-being of Future Generations (Wales) Act and the Planning (Wales) Act.</p>

2. Sustainable Management of Natural Resources

Healthy, resilient ecosystems underpin our economy, health and well-being and are an important part of our culture. They provide us with our food, clean water and air, the raw materials and energy for our industries and protect us against hazards, such as flooding and climate change.

Ecosystem services and benefits

The United Nations defines ecosystem services as ‘the benefits that people obtain from ecosystems’. They can be divided into 4 categories

- **Supporting services** necessary for the production of all other ecosystem services, such as soil formation, nutrients cycling and primary production.
- **Provisioning services** such as crops; fish; timber and genetic material.
- **Regulating services** such as water purification; flood control; carbon sequestration and pollination.
- **Cultural services** providing a source of aesthetic, spiritual, religious, recreational or scientific enrichment.

The Environment (Wales) Bill (– the Bill) introduces the opportunity for a new legislative approach for the way that we manage our natural resources in a more sustainable, proactive, collaborative and joined-up way. To deliver this new approach, the Bill introduces a number of mechanisms and tools, which seek to achieve the **sustainable management of natural resources**.

The objective of the sustainable management of natural resources is to maintain and enhance the resilience of ecosystems and the benefits they provide and, in so doing, meet the needs of present generations of people without compromising the ability of future generations to meet their needs.

The sustainable management of natural resources has a wide definition, and includes

- How we use our natural resources
- How our activities impact on our natural resources (for example through actions to manage pressures such as through resource efficiency, and regulation) and
- Positive actions such as restoring habitats and improving connectivity, nature based solutions which provide opportunities to develop sustainably and contribute across the well-being goals.

Our natural resources include all living organisms (excluding people) and the non living components and materials of the natural environment; our geological resources, air, water, soil, tide, wind and solar.

2.1 The principles – sustainable management of natural resources

To meet these objectives, the Bill provides for a number of principles which underpin the sustainable management of natural resources and which provide the method by which it is to be delivered. Each principle is applied equally

Building resilience	A resilient ecosystem is one that is healthy and functions in a way that is able to address pressures and demands placed on it, and is able to deliver benefits over the long term to meet current social, economic and environmental needs.
Managing for multiple benefits	Our ecosystems provide us with a wide range of services and benefits. We need to take all of these into account when we make decisions about how we use them, so that they provide multiple benefits for the long term. This includes taking into account their intrinsic value.
Adaptive management	Ecosystem processes and functions are complex and variable, and our approach will be adaptive with a focus on active learning derived from monitoring and outcomes and taking into account the time lags and feedback times for ecosystems to respond to interventions. It is about 'learning by doing'.
Long term	It is also important to take account of the short, medium and long term consequences of actions, and consider time lags and feedback times for ecosystems to respond to any interventions.
Evidence	This means gathering information and considering all the social, economic and environmental evidence (including evidence in respect of uncertainties) from a wide range of experts and stakeholders at the local, regional and national level as appropriate, both to identify priorities and opportunities for their management and also in delivering the management actions.
Collaboration and co-operation	It is about having a two way communication across local, regional, national and international levels and being interconnected between policy, process and people to break down silo ways of working. This approach supports the development and implementation of the new, innovative solutions that are needed.
Working at the right scale	An ecosystem is a functioning unit that can operate at any scale depending on the problem or issue being addressed.

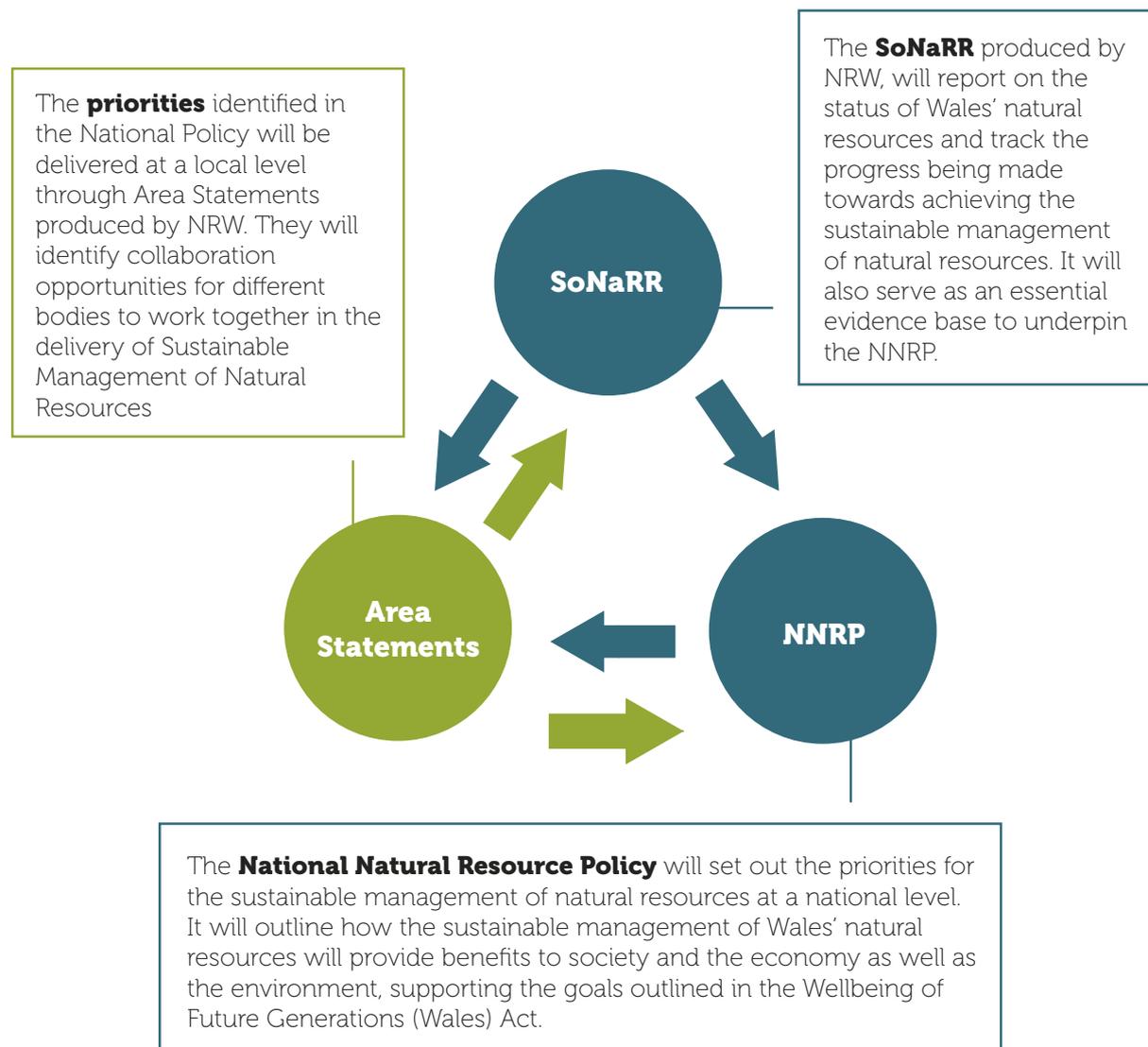
The UN Convention on Biological Diversity (CBD) describes the ecosystem approach as “a strategy for the integrated management of land, water and living resources that promotes conservation and sustainable use in an equitable way” and is widely recognised as international best practice for addressing the decline in biodiversity.

Through the concept of sustainable management the Bill puts the ecosystem approach on a statutory basis, drawing on the 12 principles established by the CBD.

2.2 The delivery framework

The Bill also introduces an iterative and interconnected framework through the publication and review of the following documents:

- **SoNaRR** produced by NRW
- **NNRP** produced by the Welsh Ministers
- **Area Statements** produced by NRW



2.3 Biodiversity and resilience of ecosystems duty

In addition to the objectives, principles and framework above, to assist in the long-term sustainability of ecosystems the Bill also introduces an enhanced biodiversity and resilience of ecosystems duty that will apply to public authorities who exercise functions in relation to Wales¹. This enhanced duty will place biodiversity as a “natural and integral part of policy and decision making” within public authorities in Wales. A new reporting duty enables public authorities to report on actions taken to improve biodiversity and to promote the resilience of ecosystems and also what actions have been taken to incorporate biodiversity measures into other areas of policy, strategies or initiatives.

¹ This is a wider group of bodies than that required to provide information and assistance to NRW in the preparation of SoNaRR or area statements.

3. The Key Challenges

Building resilience	<p>This chapter illustrates the current environmental, social and economic evidence from which we have identified some key challenges for the sustainable management of our natural resources at a national level. In particular, it illustrates the risks to the benefits that our natural resources provide.</p> <p>The SoNaRR will build on this and gather information from a wide range of experts and stakeholders at a local, regional and national level as appropriate. This includes gathering information in respect of uncertainties. The Future Trends Report will contain predictions of likely future trends in the social, economic, environmental and cultural well-being of Wales.</p>
Adaptive management	
Evidence	
Collaboration and co-operation	
Working at the right scale	
Long term	
Managing for multiple benefits	

Wales faces a number of generational challenges around skills and employment, poverty, biodiversity decline and the degradation of our ecosystems and the services they provide. This chapter illustrates some of the key challenges for the sustainable management of our natural resources by looking at the risks to the benefits that our natural resources provide, including the projected impact of climate change.

The emerging **key challenges for the sustainable management of our natural resources** are

- Safeguarding our carbon stores to mitigate against climate change and protect against further carbon emissions.
- Maintaining our productive capacity for food, timber and fibre supplies
- Reducing the risk of flooding.
- Improving our health and social equity, which may be delivered in part by improving access to good quality blue and green space.
- Improving the quality and maintaining the availability of water.
- Improving the quality and connectivity of our habitats.
- Retaining the distinctiveness of our places and historic landscapes.

3.1 Resilient ecosystems, biodiversity decline and climate change²

For much of the last century we have treated our natural resources as if they were inexhaustible and we have tackled the individual symptoms of poor management or use of our natural environment rather than address the fundamental health of our natural systems – the ecosystems that support life. While our present environmental regulations, designations and controls have successfully conserved Wales' highest quality landscapes and transformed the quality of our urban environments and our rivers and lakes³, the result is a complex and piecemeal system that often struggles to address cumulative impacts and where some environmental problems remain intractable:

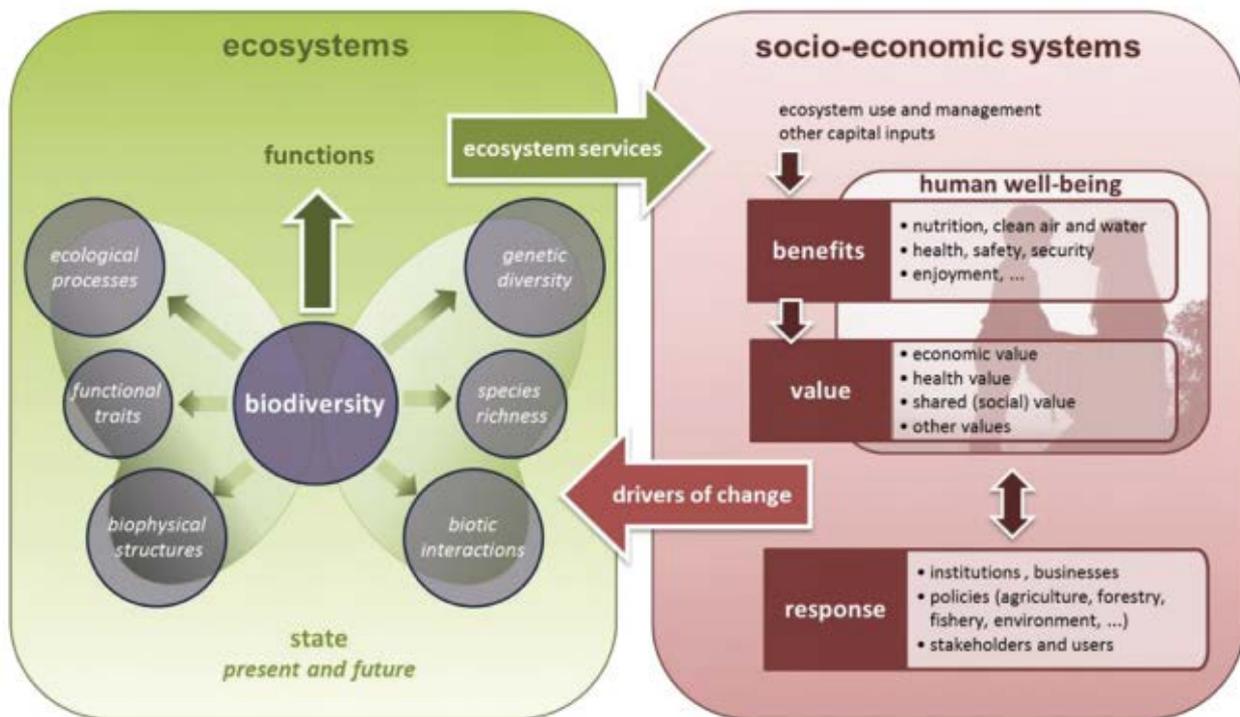
Biodiversity

Biodiversity drives the functioning and resilience of our ecosystems. **Figure 3** shows the relationship between biodiversity, ecosystem functioning and services and socio-economic systems.

² The evidence base for this document draws from a variety of sources, including the 2012 State of Environment; the 2011 UK NEA Wales Chapter; Natural Environment Sector Adaptation Plan and Welsh Government and NRW evidence and data. In addition Welsh Government policy officials and specialists from NRW have helped to build this analysis and quality assure its preliminary findings.

³ Annex A provides the last update from the 2012 State of Environment Report, the annual indicator report to monitor progress against the Welsh Government's 2006 Environment Strategy. This policy statement and the Bill supersede them, taking forward the integrated approach.

Figure 3: Conceptual framework for EU wide ecosystem⁴ assessment



The 2011 UK National Ecosystem Assessment and 2013 State of Nature Report show a continuing decline in biodiversity. Although the picture is varied, with some species experiencing recovery and others a decline, overall the threat is high. There have been major losses in habitats, for example in our lowland grassland habitat across Wales with an estimated 97% loss of species-rich dry grassland between the 1930s and the 1990s, due mainly to changing farming practices and urbanisation. Three quarters of all features within all designated sites are in unfavourable or declining condition and only around 14% of woodland is ancient semi-natural (which is of the highest biodiversity value). There has been a decline in the quantity and quality of hedges, copses, small woods, ponds and ditches which act as habitat corridors and contribute to the general loss of connectivity in the landscape. Some of the most widespread and significant effects on ecosystems are damage to vegetation from pollution such as exposure to ozone, eutrophication and acidification. Pollution from the use of herbicides, pesticides and fertilisers has direct impacts on the diversity of habitats and pollinators.

The effect of **climate change** on biodiversity over the coming decades is likely to be significant, including a further loss of habitat and a potential increase in invasive species.

⁴ <http://biodiversity.europa.eu/maes>

Climate regulation

Our natural resources play a key role in **regulating our climate**. The UK Climate Projections⁵ provides us with information about how our climate might change in the future. They suggest that Wales will see hotter, drier summers; milder, wetter winters; more extreme weather events and continued sea level rise. Our soils hold 9 times the amount of carbon that is stored in all vegetation (including forestry) – 80% of which is associated with upland and grassland soils – forming a significant carbon stock. Careful management is required to ensure they do not become a significant source of carbon. Our vegetation is also an important store of carbon; for example, the total amount of carbon stored in Welsh forests and their soils is equivalent to around 3.5 times all annual Welsh emissions.

Productive capacity

Our capacity to produce food, timber and fibre – **our productive capacity** – is at risk through the loss of soil and its quality, risks to plant and pollinator health and invasive non native species. The long-term trend of increasing volume and speed of movement of people and imported materials from a variety of sources around the world means more chance of exotic pests and diseases arriving, as well as by natural means. Significant outbreaks – for example *Phytophthora ramorum* – continue to pose a risk to our plant health, and invasive non native species are estimated to cost the UK economy at least £1.8 billion annually. Our pollinators – honeybees, bumblebees and butterflies – are in decline. Twenty per cent of the UK cropped area contains crops which are dependent on pollinators and the value of pollinators to UK agriculture is over £430 million per year. The productivity of our soils is significantly affected by a range of land management practices which result in compaction, erosion and sealing, and to maintain healthy, functioning soils, its underpinning biodiversity is essential. Soil compaction makes it more difficult for water to infiltrate it, resulting in more surface water which can potentially increase flood risk. Together with compaction, soil erosion significantly impacts on the **quality of our water** and the health of our aquatic ecosystems through increasing the risk of sediments and other farm materials such as manures running off our land. Soil sealing, which occurs when soil is covered by concrete, buildings or tarmac results in the loss of all the functions soil performs apart from being a platform for development.

Climate change projections indicate an increased risk of drought, which is set to reduce the availability of water in summer putting pressure on private and public drinking water supplies, together with more intense rainfall which may wash more pollutants into our water courses.

⁵ (UKCP09)

Flooding

Flood risk in Wales is a significant issues with many of our urban settlements built alongside rivers and streams and on river and coastal floodplains, a total of 208,500 properties in Wales are at risk from river and sea **flooding** and 163,000 at risk from surface water flooding. The loss of natural coastal flood defences through coastal erosion, habitat loss and development pressure is a key challenge.

Climate change is likely to increase the frequency of extreme weather events resulting in more frequent and severe flooding. Coupled with rising sea levels many of our urban areas will be more vulnerable to flooding.

Health and Equity

Air pollution is considered the biggest environmental contributor to the burden of **disease** in the UK⁶, with an estimated cost to the UK of fine particulate pollution valued at £9-19bn/year⁷. A report⁸ published in 2014 estimated that, in Wales in 2010, around 1,320 deaths could be attributed to long-term exposure to fine particles that can be inhaled deep into the lungs. Noise pollution is considered the second biggest environmental contributor to the burden of disease in the UK, with a cost valued at £7-10bn/year⁹. Noise maps¹⁰ produced in 2012 indicate that the homes of more than 200,000 people in Wales are exposed to levels of road traffic noise exceeding World Health Organisation night noise guidelines. Many of these issues are also issues of **social equity**. For example, people who are already suffering from poor health and/or who live in the areas of poorest air quality are more likely to be affected; therefore poorer urban communities may be disproportionately hit. Litter and fly-tipping also impacts on our long-term health and well-being and deprived communities are often disproportionately affected. The implications of projected climate changes suggest that typically older people, lower-income groups and tenants are more at risk of flooding due to living in poorer quality housing in coastal locations and in urban areas with the least green space. In addition, Wales is facing unprecedented public health challenges, in part as a result of physical inactivity and sedentary lifestyles.

Built up areas lacking in Green Infrastructure are more prone to extreme heat events and flooding.

6 www.euro.who.int/en/health-topics/environment-and-health/pages/evidence-and-data/environmental-burden-of-disease-ebd

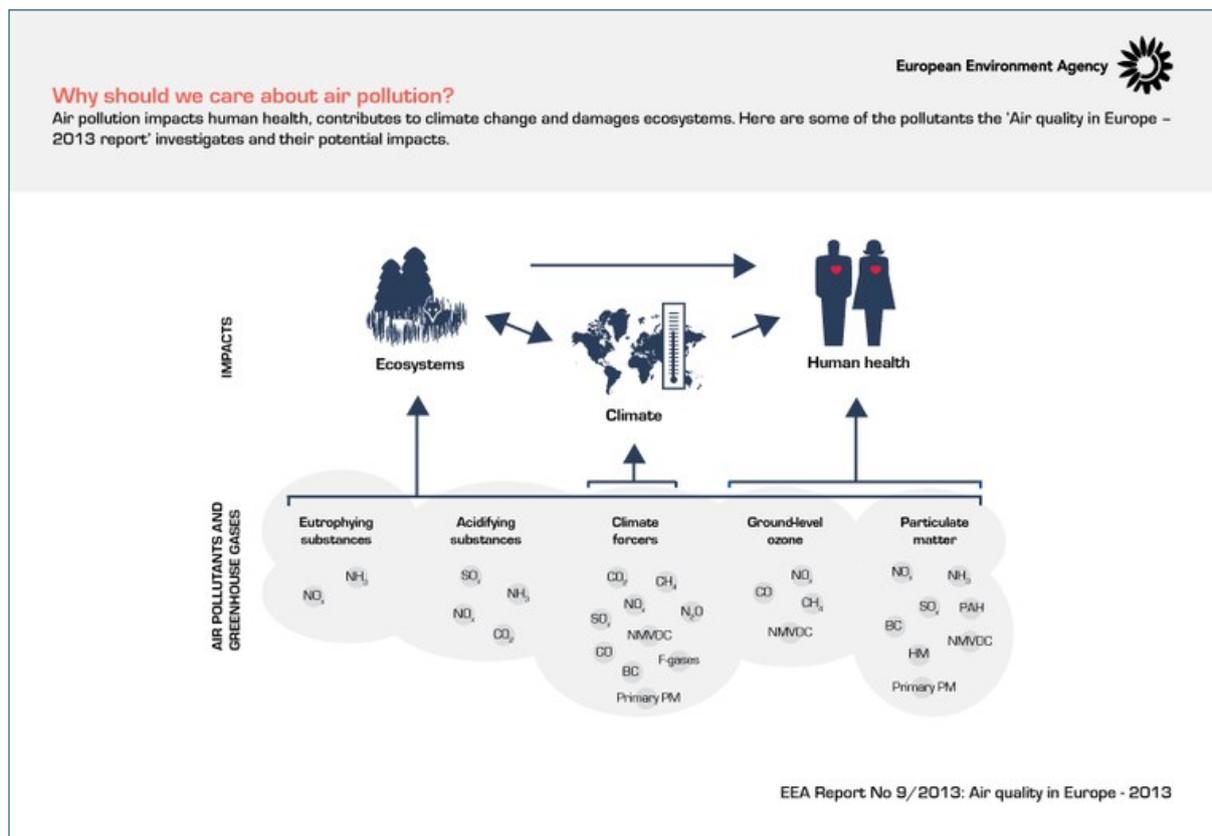
7 www.gov.uk/air-quality-economic-analysis

8 www.gov.uk/government/publications/estimating-local-mortality-burdens-associated-with-particulate-air-pollution

9 <https://www.gov.uk/noise-pollution-economic-analysis>

10 <http://data.wales.gov.uk/apps/noise/>

Figure 4: Why should we care about air pollution?¹¹



Water supply and quality

Wales records some of the highest rainfall levels in the UK, and we rely on this rainfall which is collected in our rivers, lakes and reservoirs as sources of **water supply** for Wales and England. However, in significant parts of Wales, there are no further reliable supplies of water available for new abstractions. In addition to the land management practices above which result in soil erosion and compaction, **water quality** in Wales also still suffers from an industrial legacy including from abandoned metal mines, which are one of the most significant pressures on our water environment, and the legacy of land contamination.

The availability of water is likely to become a bigger concern in the future if the effects of **climate change** take hold as is currently forecast. Projections show an increased risk in the frequency and magnitude of droughts. More prolonged periods of hot, dry weather results in greater evaporation from our reservoirs and reduced recharge of water into our underground water resources in areas of Wales where these are important. There are also likely to be lower summer river flows and higher river temperatures. This, combined with an increased consumer demand for water which is often seen during these hot periods, will cause significant pressures on both the environment and water supply for consumers.

¹¹ EEA

Landscapes

Wales is renowned for its attractive landscapes, with three National Parks and five Areas of Outstanding Natural Beauty covering 24% of the country's land surface. Fifty seven percent of the Welsh landscape is considered to be of outstanding or high landscape quality. The landscape is also an important part of the historic environment of Wales; in addition to its general historic character, many historic parks and gardens, and 58 landscape areas have been registered for their special historic interest. Eleven percent of Wales is urban land cover and the total land on farm holdings accounts for approximately 87% of the total land area of Wales. The UK National Ecosystem Assessment shows that the character of the Welsh landscape was impacted during the mid-20th Century by developments relating to energy, transport and tourism and through forest design.

3.2 Poverty and inequality

Poverty has an enormous impact on the well-being of Wales, not least because of the scale of its impact, the breadth of its influence and the depth of the inequalities created. Across the board, people from lower socio-economic groups do not, on average, enjoy the same quality of life as people from higher socio-economic groups, whether it is lower life expectancy, poorer health, lower educational attainment or lower incomes and wealth. Recent evidence shows that a large gap remains between the health of the most and least deprived communities. In her 2012-13 annual report, the Chief Medical Officer for Wales reports that, whilst life expectancy in Wales has been rising, with the Welsh population living longer and having more years of healthy life than ten years ago, health challenges remain. Obesity continues to increase, with an associated rise in diabetes, more adults being treated for high blood pressure and too few people doing enough physical activity. In addition, poor mental health remains a problem. Despite improvement, health in Wales could be better and more still needs to be done to tackle the inherited problems, and avoid health problems arising in the future.

Next steps

The challenge of managing our natural resources sustainably is growing. Food security, the availability of clean water, the generation of renewable energy and the mitigation of carbon emissions are all important considerations. In Wales, we rely on imports of food, energy and consumer products, and an increasing consumer demand, rising world population and an aging population will increase our demand for food, water and other basic services. The impact of climate change will increase the pressures on our natural resources further. In particular, to understand the challenges that we will be facing, and have a clear picture of where we are heading, Welsh Ministers must publish a **Future Trends Report** containing predictions of likely future trends in the social, economic, environmental and cultural well-being of Wales – taking into account the United Nation's sustainable development goals and the impact of climate change on Wales.

In developing the NNRP, we will consider further the wider, global context and the big societal challenges we are facing.

Figure 5: Key challenges for the sustainable management of natural resources

<p>Safeguarding and increasing our carbon stores</p>	<p>A loss of carbon storage in soils – especially our peat rich uplands – and in biomass particularly where woodland is permanently removed is potentially diminishing our ability to regulate our climate.</p>
<p>Maintaining our productive capacity</p>	<p>Loss of soils and reducing soil quality, threats to pollinators and our plant health and from invasive non-native species risk the productive capacity of our land for food, timber and fibre; including for energy.</p>
<p>Reducing the risk of flooding</p>	<p>Increased soil sealing and compaction from farming practices and urban development resulting in loss of water storage capacity and more surface water run-off. The loss of natural coastal flood defences is a key challenge.</p>
<p>Improving health and equity</p>	<p>Noise, poor air quality and flytipping are impacting on our health. Lack of access to good quality green or blue space reduces individual well-being and can affect mental health. These impacts are disproportionately experienced in poorer urban areas.</p>
<p>Improving the quality and maintaining the availability of water</p>	<p>In Wales, there is a high dependency on our rivers for our water supply. Diffuse and point source pollution from a range of sources including some land management practices, sewage discharges, abandoned mines and misconnected sewers is affecting our water quality.</p>
<p>Improving the quality and connectivity of our habitats</p>	<p>Changing land management practices, urbanisation, pollution and invasive non native species have led to habitat loss and fragmentation, which, coupled with acidification and eutrophication have changed the quantity and quality of wildlife they can support.</p>
<p>Retaining the distinctiveness of our places and historic landscapes</p>	<p>Wales is reknowned for its attractive and historic landscapes. During the mid-20th Century the character of the landscape was impacted by developments relating to energy, transport and tourism and through forest design.</p>

4. Emerging priorities and opportunities for the sustainable management of natural resources

Building resilience	<p>This chapter illustrates some of the emerging priorities and opportunities for the sustainable management of natural resources at a national level.</p> <p>SoNaRR will provide further information on the state of our natural resources, including where action needs to be taken to build resilience and to inform the sustainable management of natural resources. As SoNaRR develops, we will build on these emerging priorities and opportunities through a process of collaboration and engagement across a wide range of stakeholders.</p>
Adaptive management	
Evidence	
Collaboration and co-operation	
Working at the right scale	
Long term	
Managing for multiple benefits	

The objective of the sustainable management of natural resources is to maintain and enhance the resilience of ecosystems and the benefits they provide and, in so doing, meet the needs of present generations of people without compromising the ability of future generations to meet their needs.

We have identified some **emerging priorities and opportunities** for the sustainable management of natural resources at a national level which support building the resilience of our ecosystems.

These priorities deliver across the multiple challenges identified in Chapter 3 and in doing so address the root causes and provide systemic solutions to the issues.

- Better lowland soil, water, planting and habitat measures
- More urban green infrastructure
- More sustainable urban drainage
- Better coastal habitat flood management
- Improved diversity and extent of outdoor recreation facilities
- Better management and use of designated sites
- Better located and managed woodlands and trees
- More upland peat management

They are supported by actions to manage the pressures and threats on our natural resources through:

- Better biosecurity.
- Reducing pollution through integrated, landscape approaches

- Increasing resource efficiency and
- More local, renewable energy generation.

There are also significant opportunities to help unlock and realise the potential of our natural resources, including through the better management and enhancement of our historic assets and landscapes.

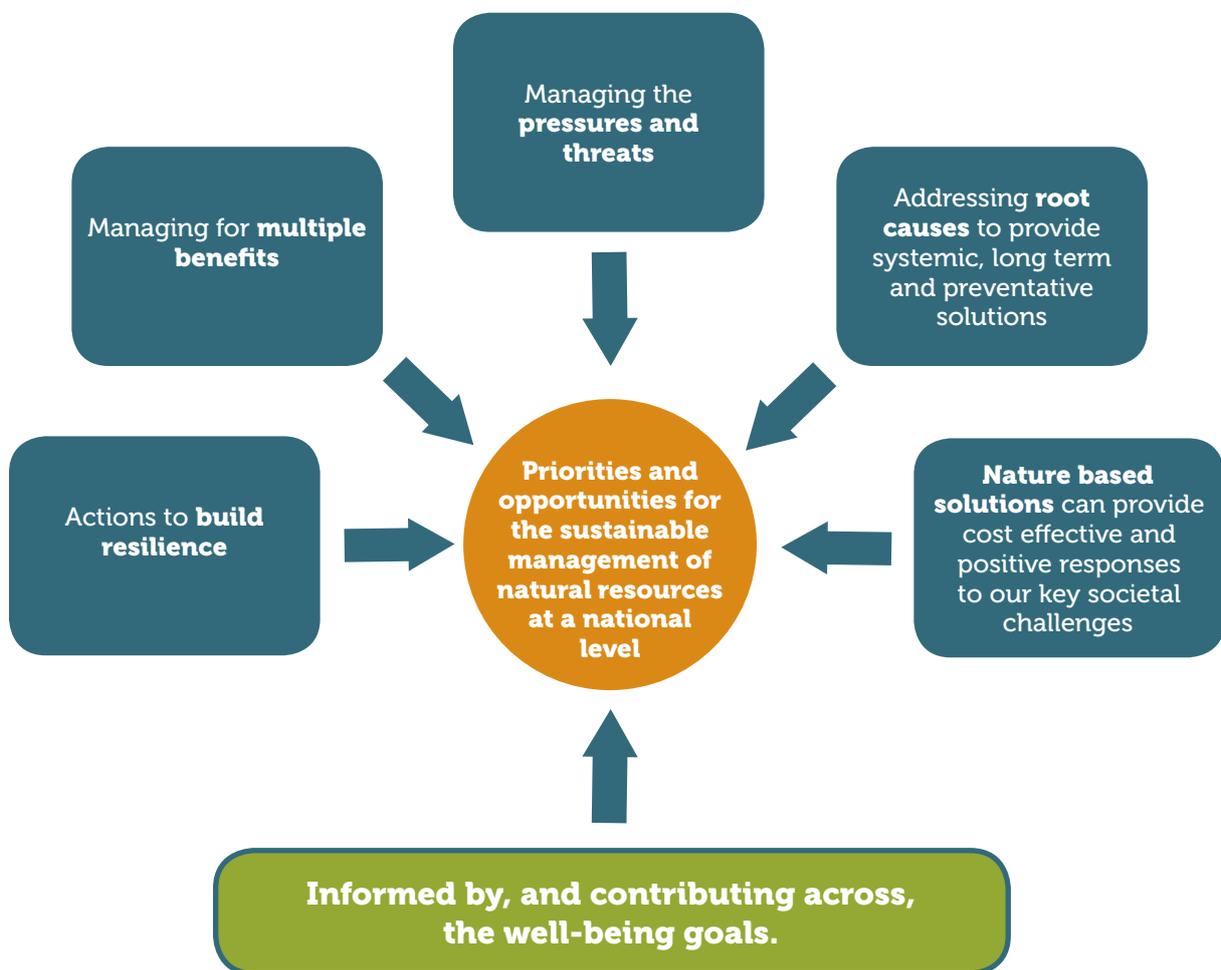
Chapter 5 describes each further, together with the scale of implementation.

Figure 6: Our priority areas for action



Next steps

SoNaRR will provide further information on the state of our natural resources and to inform the sustainable management of natural resources. In developing NNRP we will use this information to consider further how we can build resilience and manage for multiple benefits by taking into account all the services and benefits our ecosystems provide – including the cultural services (which includes our historic resources). We will also look at how nature based solutions can provide positive and cost effective responses to our key societal challenges and which can help us to maximise our contribution across the well-being goals.



4.1 Building the resilience of our ecosystems

A resilient ecosystem is one that is healthy and functions in a way that is able to address pressures and demands placed on it, and is able to deliver benefits over the long term to meet current and future social, economic and environmental needs.

This means taking a proactive approach, putting in place actions to build resilience.

Aspects of resilience include:

Diversity – not only biological but also geological and physical. Generally speaking, more diverse ecosystems (biophysical and, to an extent, social and economic) are more resilient to external influences and their impacts.

Connectivity – within and between ecosystems facilitates the movement of genes, species and ecosystem components such as water across landscapes, allowing ecosystems to function effectively and to adapt spatially, for example in response to climate change. This however needs to be considered against the potential negative aspects of connectivity in terms of disease, non-native species and fire where a degree of modularity may be preferable.

Scale and Extent – The bigger the ecosystem extends, without fragmentation, the more resilient it is likely to be. For example while small patches of habitat are valuable, especially as part of larger mosaics, smaller, fragmented habitats are more influenced by edge effects which impact on the unique biodiversity and ecosystem services provided by those habitats.

Condition – The underpinning supporting services of ecosystems need to be in a healthy condition to function effectively, to deliver a range of important ecosystem services. Measurement and interventions based for example on species, ecological roles and functions and flows of nutrients can be undertaken, however the provision of ecosystem services – particularly provisioning and regulating services can be a good indicator of condition.

As an outcome of the above, the overall **adaptability** of ecosystems invites specific consideration of the adaptive cycles which many ecosystems undergo – understanding that ecosystems are not static entities and will change over time. The key question here is whether the ecosystem in question will adapt and change in the desired direction given future environmental, and socio economic changes and demands such as climate change.

Adapting to the impacts of Climate Change

The Well-being of Future Generations (Wales) Act requires that a Future Trends Report and the Well-being Assessments must take into account the latest risks from the UK Climate Change Risk Assessment. This means that our public bodies will need to understand and take into account the threats and opportunities from climate change to the delivery of their services in their local area.

The Welsh Government has published its 'Preparing for a Changing Climate', statutory guidance under the Climate Change Act 2008, which aims to help Welsh organisations adapt to the challenges of a changing climate. The guidance is intended to assist organisations such as local authorities, NRW, Dwr Cymru, the Fire Service and NHS Trusts in assessing how climate change impacts could affect their operations, and will help them prepare plans to manage the risks.

We are building resilience across sectors as a whole through the development of Sectoral Adaptation Plans. The aim is to develop plans for the following five sectors:

- Natural Environment
- Infrastructure
- Health
- Communities
- Business and Tourism

The Sectoral Adaptation Plans will identify the risks for sectors (using evidence from the Climate Change Risk Assessment¹² and key stakeholders), analyse the current policy response, identify any gaps and barriers to effective action and put in place a programme for mainstreaming climate change into delivery across all portfolios to support a growing economy.

We are currently working on the Natural Environment Plan with the Climate Change Commission for Wales and the threats and opportunities identified are being fed in to the development of the NRRP alongside SoNaRR.

4.2 Managing for multiple benefits

Our ecosystems provide us with a wide range of services and benefits. We need to take **all** of these into account when we make decisions about how we use them, so that they provide multiple benefits for the long term. This includes taking into account their intrinsic value.

¹² Reference

4.3 Nature-based solutions and maximising our contribution across the well-being goals

The sustainable management of natural resources, through **nature-based solutions**, provides a wide range of opportunities to tackle many of the deep rooted social and economic challenges facing Wales; helping to reduce and prevent poverty, support resilient communities, drive green growth and contribute across the wider well-being goals in the Well-being of Future Generations Act. There is good evidence that environmental benefits are unequally distributed through society, with disadvantaged groups having poorer access to the natural environment. Knowing as much as possible about who the beneficiaries will be is an important consideration.

The European Commission describes **nature-based solutions** as positive responses to societal challenges which can have the potential to simultaneously meet environmental, social and economic objectives through actions inspired by, supported by or copied from nature; both using and enhancing existing solutions to challenges, as well as exploring more novel solutions. Nature-based solutions can transform societal challenges into innovation opportunities by capitalising on existing knowledge and turning natural resources into a source for green growth and sustainable development – helping to reduce and prevent poverty and build resilient communities. Maintaining and enhancing our natural resources – through actions to build resilience and manage the pressures and threats – is of crucial importance, as it forms the basis for solutions.

The Well-being of Future Generations (Wales) Act 2015 is about improving the social, economic, environmental and cultural well-being of Wales. It will make public bodies listed in the Act think more about the long term, work better together with people and communities and each other, look to prevent problems and take a more joined-up approach. This will help us create a Wales that we all want to live in, now and in the future. To make sure we are all working towards the same vision, the Act puts in place seven well-being goals.

A prosperous Wales An innovative, productive and low carbon society which recognises the limits of the global environment and therefore uses resources efficiently and proportionately (including acting on climate change); and which develops a skilled and well-educated population in an economy which generates wealth and provides employment opportunities, allowing people to take advantage of the wealth generated through securing decent work.

A resilient Wales: a nation which maintains and enhances a biodiverse natural environment with healthy functioning ecosystems that support social, economic and ecological resilience and the capacity to adapt to change (for example climate change).

A healthier Wales A society in which people's physical and mental well-being is maximised and in which choices and behaviours that benefit future health are understood.

A more equal Wales A society that enables people to fulfil their potential no matter what their background or circumstances (including their socio economic background and circumstances).

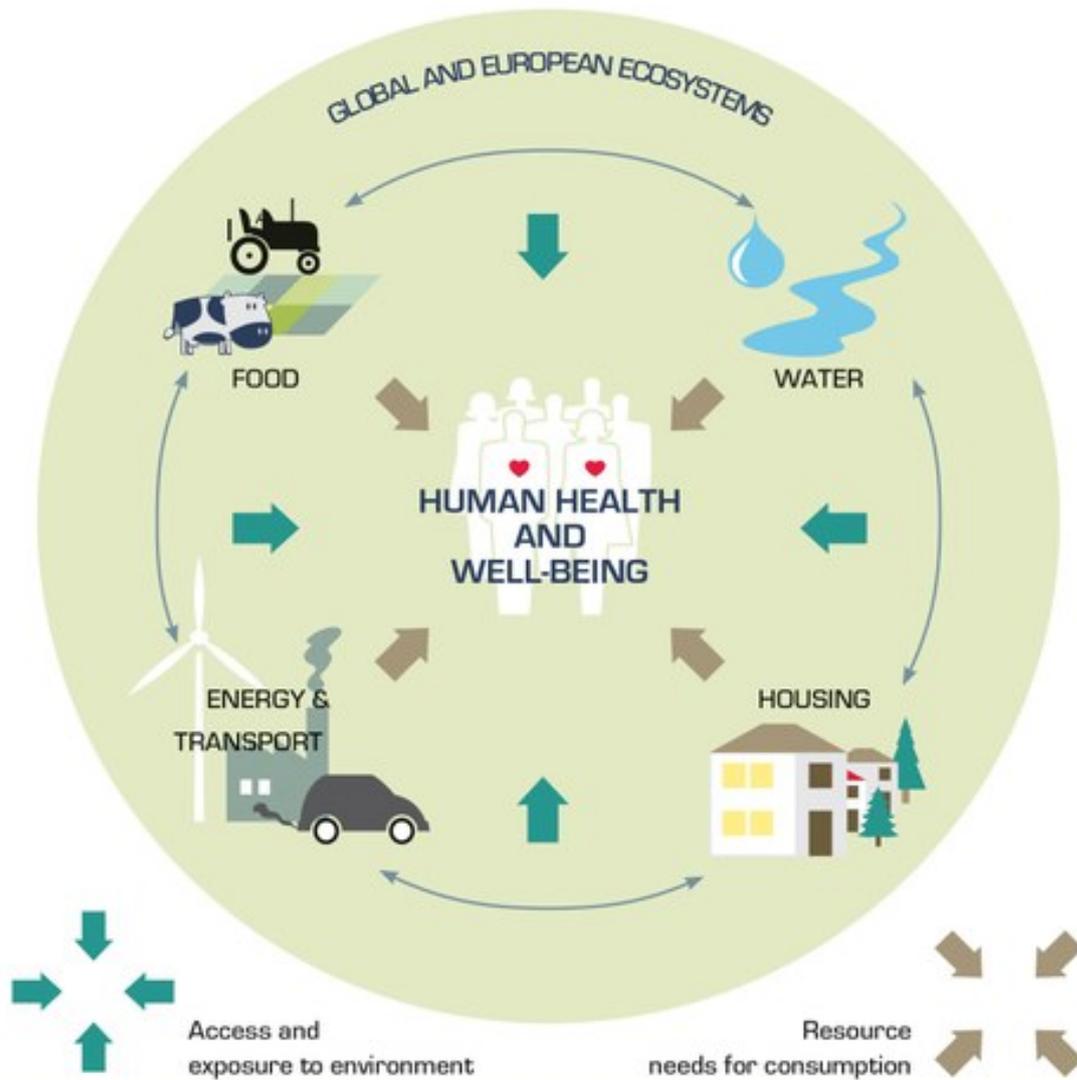
A Wales of cohesive communities Attractive, viable, safe and well-connected communities.

A Wales of vibrant culture and thriving Welsh language A society that promotes and protects culture, heritage and the Welsh language, and which encourages people to participate in the arts and sports and recreation.

A globally responsible Wales A nation which, when doing anything to improve the economic, social, environmental and cultural well-being of Wales, takes account of whether doing such a thing may make a positive contribution to global well-being.

The focus on ecosystem resilience in the Environment (Wales) Bill directly addresses the Well-being of Future Generations (Wales) Act 2015's well-being goals.

Figure 7: How are the environment and our health and well-being connected?¹³



To help us know whether we are making progress towards achieving the well-being goals in the **Well-being of Future Generations (Wales) Act 2105**, Welsh Ministers must set national indicators which measure a particular outcome. The **SoNaRR** will provide a set of indicators supporting the national indicators, measuring the extent to which the sustainable management of natural resources is being achieved.

¹³ EEA

5. Implementing our priorities and opportunities

Building resilience	<p>This chapter illustrates our emerging approaches for implementing the priorities and opportunities, and how they can be brigaded into different scales for implementation across different stakeholders.</p> <p>In implementing the priorities, we need to work together to provide joined-up solutions.</p> <ul style="list-style-type: none"> • Better lowland soil, water, planting and habitat measures • More urban green infrastructure and SuDs • Better coastal flood management • Improving the diversity and extent of outdoor recreation facilities • Better management and use of designated sites • Better located and managed woodlands and trees • More upland peat management • Managing the threats and pressures on our natural resources • Unlocking and realising potential
Adaptive management	
Evidence	
Collaboration and co-operation	
Working at the right scale	
Long term	
Managing for multiple benefits	

5.1 Working at the right scale

An ecosystem is a functioning unit that can be considered to operate at any scale depending on the problem or issue being addressed. This understanding defines the appropriate level for management decisions and actions, and includes:

- Addressing and delivering at the appropriate level, including considering the appropriate local, regional or national spatial scale to address issues or to enable the delivery of priorities and opportunities.
- Considering the appropriate ecological, social, cultural and economic scale for communication, collaboration and engagement around a particular issue – for example catchment, landscape or seascape, community or local authority. This needs to relate to governance and decision making frameworks.
- Understanding adjacent effects – the potential impacts on and from other ecosystems, including cumulative impacts and unintended consequences of taking action at a particular scale.
- Understanding global impacts - taking account of whether the action makes a positive contribution to global well-being.

5.2 Supporting vibrant rural communities through landscape scale approaches

The population in rural Wales is relatively sparse with many small communities and farms. Local economies are to a large extent dominated by agriculture with a very high proportion of livestock farming and large areas of forest. Our priorities and opportunities for rural communities are

- Improving the diversity and extent of outdoor recreation facilities
- Better located and managed woodlands and trees
- More upland peat management
- Better lowland soil, water, planting and habitat measures
- Better management and use of designated sites

These provide opportunities for land-owners and interested partners to join together to develop landscape scale solutions to our key challenges.

Outdoor recreation brings substantial benefits to Wales' economy and generates significant health benefits for the population. Tourism is an important element of the economy, and the National Parks covering the highest mountains in the north and south of Wales are visited by large numbers of tourists. About 30% of the land area in Wales has environmental designations with National Parks making up around 20%. **Improving the diversity and extent of outdoor recreation facilities** provides many opportunities because it is a growing economic sector in localities where many traditional agriculture and industry sectors are declining.

- Walking as an activity generates £562m of additional demand in the Welsh economy and around 11,980 person-years of employment.
- Wales' National Parks account for over half a billion pounds of Wales' GVA, representing 1.2% of the Welsh economy. They receive 12 million visitors each year spending an estimated £1b in goods and services. Around three quarters of the population in Wales make at least one visit to a National Park each year.
- Woodlands and trees contribute to local economies through the recreational opportunities that they provide to visitors and local communities: in 2013, 64% of adults surveyed in Wales had visited woodland in the last few years; and 88% of all off road cycling and mountain biking visits in Wales included time spent in woodland.
- The 'Great Britain Day Visits Survey – Wales summary' found that 90 million tourism day visits were made by British residents to destinations in Wales in 2014, generating expenditure of £2,677m. In 2013, 78% of day visits originated within Wales itself, underlining the significance of the resident market. The Wales Visitor Survey 2013 showed that 30% of respondents were motivated to take part in outdoor activities during their trip.

The **historic environment** also draws in many visitors into the Welsh countryside. In 2014, 2.5 million people visited the 129 sites in Cadw's care, many of which are in rural locations. Many of Wales' most beautiful natural landscapes are also rich in the remains of previous human activity. The Welsh archaeological trusts, and local and national park authorities have developed walks and other resources to encourage people to explore and enjoy the natural and historic environment in regions like the Preseli Hills, the Brecon Beacons and the Clwydian Hills.

In terms of its contribution to the Welsh economy, the **forestry sector** has an annual Gross Value Added of £455.7m (comprising £19.9m from forestry and logging; £147.7m from the manufacture of wood and products of wood and cork; and £288.1m from the manufacture of paper and paper products). The sector directly employs 8,500 people with a further 2,800 people self employed, bringing the total number of people working in the sector to 11,300. There are also small scale local enterprises and individuals engaged in economic activity relating to non-timber products.

Farm woodland provides an opportunity to diversify farm practice. Most new tree planting takes place on agricultural land and there are significant opportunities for farmers if this is better integrated with their agricultural business as well as with the landscape and wider environment. Using agroforestry techniques could have potential to increase the productivity of agricultural holdings while also locking up carbon and contributing to production of useful forest products.

There are approximately 306,000 hectares of forests and woodlands in Wales and they are a valuable natural resource helping Wales's response to the effects of climate change and meeting the needs of people and communities. Forests and woodlands are predicted to remain a net sink for atmospheric carbon and current sequestration from Welsh woodland is estimated to be 1,419,000 tonnes annually. Most modern building materials are produced using large quantities of fossil fuel. Wood is unique as a building material. When it is grown in sustainably managed woodland, its carbon footprint is near to zero – all the carbon it contains is absorbed from the atmosphere. Only a very small proportion of fossil carbon is used and some soil carbon is lost to the atmosphere after the woodland is first established, although this can be minimised by reducing cultivation intensity. As a near zero-carbon material, wood will be an essential ingredient of sustainable building practice in future. Wood which is not suitable for building with can be used as a sustainable fuel, providing that it is sourced from sustainably managed woodland and the felled trees are replanted or regrow immediately.

Payments for Ecosystem Services

The Welsh Government is considering all possible funding streams for developing more sustainable and robust land management, and is keen to explore the possibilities of attracting private funding to secure and enhance ecosystem services provided by land from the landowners. This approach is broadly termed payments for ecosystem services (PES). PES can be defined in terms of payments to individual or groups of land managers and others to undertake actions that increase the resilience of ecosystems so that they are able to provide increased longevity, quantity and quality of desired ecosystem services, which benefit specific or general users. Developing markets for ecosystem services is a crucial tool for delivering sustainable natural resource management. It recognises the importance of ecosystems and their services to the economy and well-being of Wales and can help deliver the positive changes and benefits for wildlife, water quality, flood risk reduction, health and well-being, carbon safeguarding, and rural communities. In particular, we are working to create the infrastructure and frameworks to support new markets for ecosystem services. Realising the value of ecosystem services and generating an income for their management allows us to realise both positive environmental outcomes and provide farmers and land owners with new income streams. This is one of the many tools that the Welsh Government is using to deliver its key priorities of creating jobs and growth and tackling poverty, while ensuring we maintain a resilient and diverse environment as well as demonstrating the benefits of the ecosystem approach to natural resource management and the development of ecosystem markets and a green economy.

Better located and managed woodland and trees means:

- An increase in the species richness and structural diversity of our trees and woodland, which, together with connecting fragmented woodland and scrubland habitats is key to increasing their resilience and can help support biosecurity.
- Planting trees in interception sites may help to reduce the risk of flooding downstream and improves our resilience to drought.
- All sustainably managed woodland has significant potential to provide a place for nature and for natural processes to work effectively. This can be improved by both restoring connectivity within habitat networks and maintaining significant areas of woodland of appropriate quality so that species that are dependant on woodland habitat are able to find sufficient area of habitat which is relatively undisturbed.
- Well planned woodland management ensures that woodland habitat remains of a high quality throughout management work.

Better lowland soil, water, habitat and planting measures at a landscape scale are priorities for the sustainable management of natural resources and includes:

- Increasing the quantity and quality of planting and habitat management measures to increase the connectivity between habitats and provide opportunities for pollinators increases the resilience of our biodiversity.
- Managing soil erosion and compaction and the use of farm slurry and manures through good land management practices, strategic hedge and tree planting and the management of buffer strips or riparian fencing also promotes improvement to the quality of our water by reducing sediments and nutrients reaching our water courses.
- Improving soil permeability, which, together with other land management practices that will help to slow down the run-off of water – such as planting trees in key interception sites – will help to reduce the risk of flooding downstream and improve our resilience to drought.

There are opportunities for using livestock farming by-products – slurry or manure – as a substrate for generating energy in anaerobic digestion plants. The system is most efficient when co-digestion takes place with a higher energy material – food waste is particularly suitable. The process has additional multiple benefits in terms of:

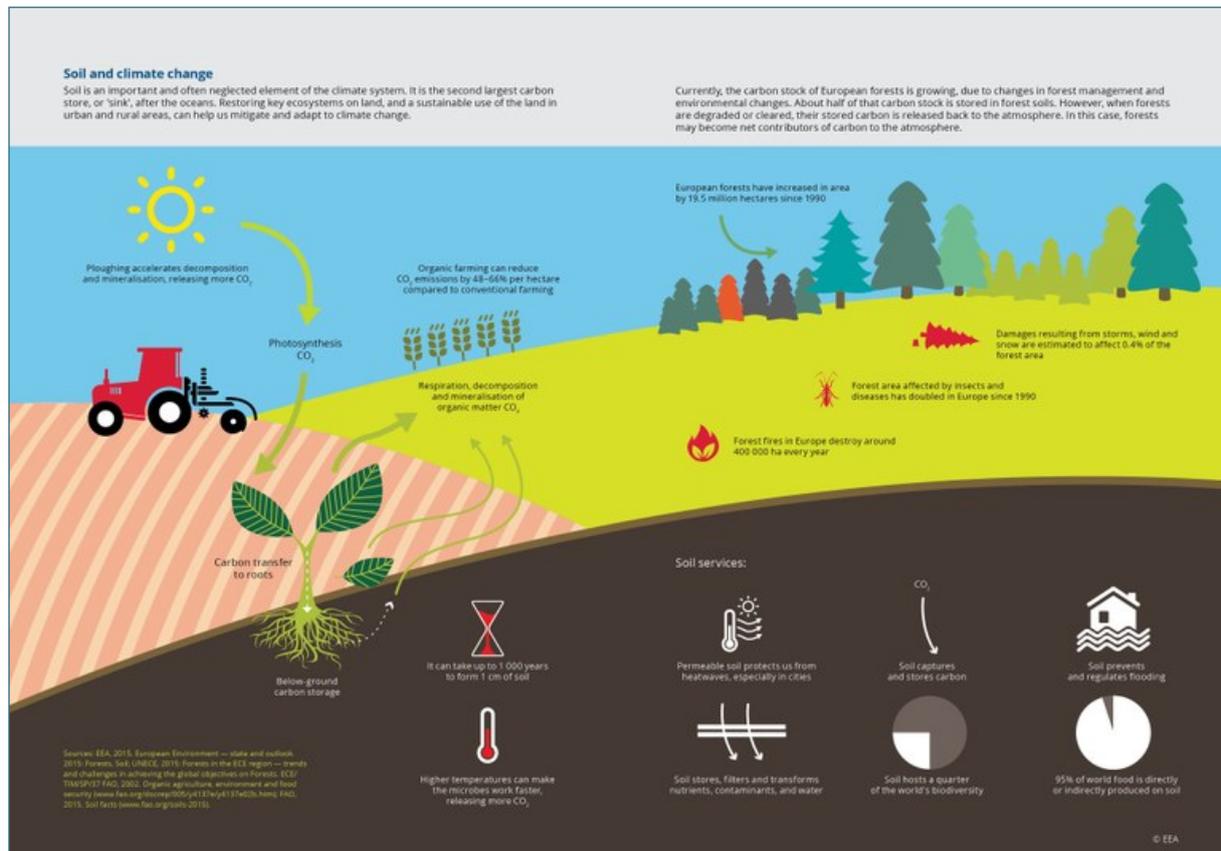
- preventing release of methane – a potent greenhouse gas - into the atmosphere from slurry/manure stores,
- providing a source of organic matter to benefit soil structure, and
- providing major plant nutrients - especially readily available nitrogen – which can reduce the need for manufactured fertilisers to achieve optimum crop and grass yield.

The management of food waste through composting or anaerobic digestion produces a valuable compost/fertiliser which can help restore the carbon and nutrient levels in our soils.

More upland peat management at a landscape scale is also a priority. The restoration of peat soils slows down the run-off of water to reduce flooding downstream, helps purify our water and regulates carbon. Appropriate grazing regimes and upland management will improve the condition of the uplands to support biodiversity.

- The Welsh Government has a target to restore 66,000ha of peat. This would deliver annual emissions reductions of between 73,000 and 97,000 tonnes of carbon dioxide equivalents per year.
- The peatland code found that peatland restoration was a cost effective means of reducing greenhouse gas emissions. The inclusion of the wider benefits – such as to water quality, recreation and wildlife – would significantly increase the net benefits of such investments.
- National Park environments sequester carbon through their peat and woodland, the value of which is estimated to be between £24.4m and £97.2m.

Figure 8: Soil and climate change¹⁴



Our historic assets and landscapes

Many of our actions in managing our natural resources impact on, or enhance, the historic components of our landscapes including historic woodlands, field systems and hedgerows, traditional buildings and ancient monuments and archaeological sites. The landscape of Wales is largely the product of 6000 years of farming, industry and settlement and the distinctive places in which we live are the product of the integration of both these historic and natural components. Planting and habitat management and the management of our uplands, coasts and woodlands can all complement the management and enhancement of designated and undesignated historic assets and landscapes.

Better management and use of our designated sites is a priority. Sites designated for nature conservation play an important role in connectivity across the landscape, and in many cases, as reservoirs of a diverse range of habitats and species. Sites are designated for nature conservation purposes to protect and enhance our rare habitats and species, as well as the best examples of natural biodiversity and geo-diversity in Wales. These environments are complex, often ancient, systems

¹⁴ EEA

with great richness and genetic reserves of plants and animals, including pollinators. Improving the condition of these priority areas while expanding and making connections between them will improve the resilience of our ecosystems. National Parks and Areas of Outstanding Natural Beauty offer the opportunity to tackle the better management of designated sites at scale and through this also offer connectivity.

These sites may also include important components of the historic environment. Integrating these into better management directly addresses the cultural aspect of the ecosystem approach.

Our **Nature Fund** projects demonstrate how **landscape approaches** to the sustainable management of our natural resources have been implemented.

- The Long Forest <http://gov.wales/docs/desh/publications/150701-nature-fund-fact-sheet-long-forest-en.pdf>
- Castlemartin Peninsula – Integrating Natural and Social Resources <http://gov.wales/docs/desh/publications/150514-nature-fund-fact-sheet-castlemartin-en.pdf>
- The Berwyn, Migneint, Black Mountains and Radnor Upland Recovery Project <http://gov.wales/docs/desh/publications/150622-nature-fund-fact-sheet-upland-restoration-en.pdf>
- Snowdonia and Hiraethog Peatland Restoration <http://gov.wales/docs/desh/publications/150514-nature-fund-fact-sheet-snpa-en.pdf>

Details of the Welsh Government Rural Communities – Rural Development Programme – 2014–2020 can be found at

<http://gov.wales/topics/environmentcountryside/farmingandcountryside/cap/ruraldevelopment/wales-rural-development-programme-2014-2020/?lang=en>

5.3 Resilient urban communities

Our priorities and opportunities to build resilience in our urban communities are

- More, good quality, urban green infrastructure and SuDs.
- Better located and managed woodlands and trees
- Developing local renewable energy and resource efficiency projects

Green infrastructure includes parks, local nature reserves, playing fields, private gardens, allotments and community growing sites, street trees and verges, railway embankments, green walls and roofs, and green off-road travel routes such as riverside walks and canal towpaths. **More, good quality, urban green infrastructure** is a priority:

- A growing body of evidence illustrates the importance of access to natural green-space, including our water bodies, woodlands and green corridors near to

people's homes, for people to be physically active. Urban parks also contribute to healthy living. This historic character of many of these parks contributes to local distinctiveness and sense of place. Well-maintained, attractive green infrastructure is crucial to increasing the time people spend doing healthy outdoor activity such as walking, cycling, gardening or participating in sport, not to mention building pride in local communities by enabling outdoor volunteering.

- There is a growing evidence base in relation to the health benefits of positive sounds – such as birdsong, flowing water and leaves rustling in the breeze – associated with a sense of safety and well-being, and the multi-sensory concept of tranquillity.
- Increasing and promoting easy access to green spaces to urban communities is also beneficial to mental health, particularly for deprived communities.
- Green infrastructure also encourages tourism and business investment to an area, and makes places more desirable to live and work.

Pollinators and other wildlife thrive when their habitats are sufficiently well connected, so a good distribution of green infrastructure of a kind that supports native wildlife across our towns and cities is vital for the health of urban ecosystems.

Our **Nature Fund** projects demonstrate **landscape approaches** to increasing biodiversity

Pollinators for Life

<http://gov.wales/docs/desh/publications/150514-nature-fund-fact-sheet-pollinators-for-life-en.pdf>

Natural Buzz

<http://gov.wales/docs/desh/publications/150514-nature-fund-fact-sheet-natural-buzz-en.pdf>

Trees in urban settings play an important role in providing a clean, attractive and resilient built environment. Evidence in favour of urban tree planting has shown the role of trees in reducing air pollution, regulating against urban flooding and reducing surface temperatures. As in rural areas, trees in urban settings are likely to become important tools in future efforts to adapt to a changing climate whilst also improving well-being and standards of living, for example as a means of addressing the prevalence of illnesses like asthma. Trees also provide shade and cooling in extreme heat, soften man-made noise by providing natural sounds such as wind in leaves and birdsong, and can act as a traffic calming measure, improving driver behaviour and making roads safer. These benefits could be enhanced through further urban tree planting.

NRW has collected evidence in favour of the management of urban trees and increased tree cover in urban areas. NRW's study *Tree Cover in Wales' Towns and Cities* provides an analysis of the canopy cover in our towns and cities. Urban tree canopy cover in Wales was 16.8% in 2009 – mid range in terms of world rankings but lower than the 20% of cover in the UKFS woodland definition. In partnership with Wrexham County Borough Council, the recent NRW and Forest Research iTree report calculated that the ecosystem services provided by Wrexham's trees are collectively valued at £1.2m per annum. This includes a £460,000 saving in sewerage charges by diverting 278 million litres of rainfall from the drainage system and a £700,000 saving for the NHS by removing 60,000 tonnes of air pollution from the atmosphere. In addition, 1,329 tonnes of carbon is removed annually from the atmosphere, some 65,773 tonnes of carbon being stored over the life of Wrexham's trees.

Sustainable urban drainage systems (SuDS) schemes typically use combinations of installations such as permeable paving, soakaways, green roofs, swales and ponds and can be used effectively in both rural and urban areas to support new development without adding to the risk of flooding or pollution. The SuDS approach to surface water drainage provides an alternative to conventional, piped drainage which has benefits in protecting water quality and reducing flood risk, and can provide amenity and biodiversity opportunities. Reduced run-off to sewers provides additional capacity without expensive engineering work, whilst more natural systems such as wetlands and swales improve water quality and provide biodiversity and amenity benefits. This approach can slow down the flow of water, contributing to a reduction in flood risk and protecting water quality. Retrofitting of SuDS can also relieve pressure on existing drainage systems, resulting in savings in maintenance or upgrading.

More local renewable energy generation. We will optimise the way we use our renewable energy resources to benefit the people of Wales, now and in the future. Moving from a system where centralised power generation is the norm, to a system where more energy will be generated, stored and used locally from a mix of renewable sources will reduce the need to extract fuels from our geological resources. By developing local solutions we will reduce the pressure on the grid infrastructure, become more resilient to fluctuating energy prices through a clean, secure supply of sustainable energy, which will help to meet our climate change commitments. Local generation is already offering communities the opportunity to develop and invest in local schemes, and to generate a return from these projects that can be used to meet local priorities. We will increase the scale at which this happens.

Increasing the efficient use of our resources. Reducing our demand for energy and increasing energy efficiency at the point of use means that less energy needs to be generated and that it is easier to meet demand using low carbon sources of energy. This in turn will reduce the need to generate energy (both electricity and heat) from fossil fuels; lowering our carbon emissions and reducing our impact on the environment. Using water efficiently is essential. A reduction in water use will

reduce the energy used in the treatment and delivery of drinking water, helping to reduce our carbon footprint. Actions to move towards a circular economy in Wales – where raw materials in products and services are kept in productive use for as long as possible - would significantly reduce the demand for virgin materials, in turn reducing the impact on our natural resources as well as the demand for energy and water used in production.

Communities

Welsh Government makes grant funding available to local authorities and communities to take forward projects that address these priorities¹⁵. The Welsh Government also funds bodies who can work with communities to take such projects forward. Funding may also be available from charitable and commercial sources.

Local authorities should use their planning powers proactively to consider the need for energy supply and ensure that communities have access to high quality green and blue spaces and avoid public exposure to harmful levels of air and noise pollution, both when consenting to developments and in their development plans in accordance with national planning policy¹⁶. The Welsh Government is developing revised practice guidance for local authority planners on renewable and low carbon energy development and how to assess the potential in their area.

New standards for SuDS to be published by the Welsh Ministers shortly should encourage their use.

Management of highways and their associated green infrastructure provides considerable opportunity for joined-up stewardship of public space to deliver multiple benefits to communities, both in terms of actions to promote trees, hedgerows and wildflowers, and the noise and air quality management measures identified in statutory action plans.

The new European programmes will fund action on community renewables and energy efficiency. The Welsh Government will continue to support action through the Resource Efficiency Wales service and the Green Growth Fund will provide access to finance for action in the public estate. Welsh Government support will be available to help local authorities and communities to work effectively with developers to plan energy developments so that they meet local needs and contribute to local resilience and the local economy, through their delivery and through community benefits and ownership. The Welsh Government and NRW will target areas of resource opportunity, and protect constrained resources, as exemplified through the approach to hydropower permitting.

¹⁵ <http://gov.wales/funding/grants/environment/?lang=en>

¹⁶ <http://gov.wales/topics/planning/policy/ppw/?lang=en>

5.4 Coastal locations

Wales has a long and varied coastline with many areas of outstanding beauty and important habitats. Sixty percent of the population lives in coastal areas, in a range of diverse communities. One sixth of the coastline is owned by the National Trust. Future flood risks and coastal erosion present a significant economic threat to some of the key economic centres of Wales. Coastal tourism is particularly important and contributes the largest proportion to the visitor economy. Much of our coastline is designated as Heritage Coast, with 75% of the coastline being protected and designated for environmental importance. The importance of the sea throughout Welsh history is clearly shown by the abundance of archaeological and historic sites found along Welsh coasts. These provide valuable evidence of human activity ranging from distant prehistory to Wales' recent industrial past. However, many are threatened by coastal erosion linked to climate change. Paid tourism attractions across Wales receive 100,000 visitors or more each year, along with the location of Blue Flag beaches, coastlines receiving the Green Coast Award and the three World Heritage sites in Wales. The Wales Coast Path generates £32.2m of additional demand in the Welsh economy, £16.1m of GVA and 730 person-years of employment.

Better coastal habitat flood management

The restoration and protection of sand dunes, together with the creation of new intertidal habitat in managed retreat areas to replace those that may be lost through coastal squeeze, provide opportunities for coastal tourism as well as an increase in biodiversity. The coastal storms that occurred during December 2013 and January 2014 were a stark illustration of the potential impact of coastal flooding to the people, economy and coastal habitats of Wales. Thanks to the network of flood defence infrastructure around the Welsh coastline, it is estimated that nearly £3bn of property and infrastructure in flood risk areas were protected. Without the flood protection afforded by natural coastal habitat such as sand dunes and salt marshes that allow wave energy to naturally dissipate, the impact of these storms would undoubtedly have been greater. It is therefore crucial that these natural flood defences are maintained and improved where possible in the face of the growing threat of climate change, with its accompanying projections of sea level rise and more frequent extreme weather events.

Over the course of this government £240m is being invested in flood and coastal erosion risk management. There will also be opportunities for Sustainable Natural Resource Management related activity in the £150m Coastal Risk Management Programme from 2018–2021.

A study undertaken by Forster and De Muelenaere in 2007 examined how managed realignment of sea walls can enhance coastal protection provided by natural habitats and save costs. Through a cost benefit exercise, it was found that economic benefits can be found through savings in sea wall maintenance, general habitat creation benefits and carbon sequestration benefits. These economic benefits increase over longer term timescales (25, 50 and 100 years). The study identified that economic benefits are maximised where the intertidal habitat creation is maximised and the land use changes do not involve high 'opportunity costs' such as low quality farmland.

5.5 Priorities and opportunities at a national scale

Better biosecurity

Biosecurity is our system of management and measures designed to protect animal and plant health. It is all the things we do to reduce the risk of the introduction and spread of pests and diseases that might affect animals and plants; and to reduce the introduction and spread of invasive non-native species. Biosecurity cannot entirely eliminate all risks. Many risks are impossible to eliminate, such as windborne incursions of insects carrying viruses and the arrival of infected migratory birds. Rather, biosecurity aims to reduce the likelihood of an outbreak, and to minimise the cost and impact of an outbreak should it occur. Our approach is therefore to strengthen partnerships with a wide range of groups including: government, the international community, industry, non-government organisations (NGOs) landowners and the public to deliver an efficient response to pest and disease threats, minimising the risk of outbreaks. This will ensure the quality and safety of our exports and imports, leading to economic growth in the production sector and safeguarding the flora and fauna in our natural systems.

An integrated, landscape approach to reducing pollution

In addition to the pollution reduction actions delivered by the priorities above, together with our existing regulatory regime, an integrated, landscape approach to reducing pollution is a priority. The main Welsh man-made sources of pollution, including noise pollution, are motorised transport and industry. Levels are brought down both locally through measures in identified hotspots and more widely through actions to drive improvements in technology and industrial practices, including resource and energy efficiency. Land use and transport planning are key to avoiding the creation of new pollution hotspots, in terms of both sources and receptors. For example, a new housing development can both create more road traffic and expose residents to existing sources of noise and air pollution, while green infrastructure can absorb pollutants and provide a buffer between places where people live and pollution sources. Physical, chemical, noise and light disturbance from built infrastructure has a cumulative impact on wildlife that will vary from species to species.

5.6 Opportunities to unlock and realise potential

Water abstraction reform

Water abstraction, the process of removing water from natural sources like rivers, lakes and aquifers, is how we meet most of our water supply needs in Wales. The licensing of water abstractions was established in 1963 to protect downstream abstractors, but it does not provide adequate flexibility to address the challenges of future water availability or the need to protect our natural environment¹⁷. To ensure

¹⁷ Environment Agency – Current and Future Water Resources – www.environment-agency.gov.uk/research/library/publications/40731.aspx

that we have robust and resilient water resources we are committed to reforming the abstraction licensing system in Wales, linking the amount of abstraction allowed more closely with how much water is available. The current abstraction licensing system includes a number of historic exemptions which allow unconstrained water abstraction for certain purposes, such as navigation and quarry dewatering. This makes it difficult to fully manage water resources in Wales without knowing what is being used and where it is going, and restricts the potential of this resource to support our economy. In order to manage water resources in a fair and comprehensive way, we will bring these abstractions into the licensing system.

Waste prevention, reuse and recycling

Regulated industries produce 70% of all the industrial waste in Wales. Focusing on waste prevention, reuse and recycling when permitting and regulating these industrial sites will reduce the future demand on virgin raw material extraction. Reducing the regulatory barriers to the end-of-waste criteria will facilitate even more reuse and recycling.

6. The wider legislative framework

There are clear links between the Bill, the Well-being of Future Generations (Wales) Act 2015, the Planning (Wales) Act and the Historic Environment (Wales) Bill in implementing the sustainable management of natural resources.

SoNaRR will provide the evidence base for policy on how natural resources are managed and sustainably used, and will be an evidence base to provide information on the state of our natural resources. Reporting will be orientated towards the ability of ecosystems to meet the needs of society, economy and the environment now and in the future. In doing so will make available the information needed for the Welsh Ministers to set priorities for action at the national level. NRW will have a duty to publish a SoNaRR every five years and to review the evidence it contains to keep it up to date.

The Future Trends report published under the Well-being of Future Generations (Wales) Act 2015 can be informed by the SoNaRR, and can help to inform the preparation of the NNRP. Other public bodies will also be required to contribute to the delivery of the Bill. Public bodies (similar to the public bodies covered by the Act), where requested by NRW, can provide information or assistance to NRW to help with the preparation and publication of a SoNaRR.

The **NRRP** will be a statement of the Welsh Government's priorities and opportunities in relation to the management of natural resources. It will set out our overarching strategic priorities for a five year period, and will be published by the Welsh Government within the first year of an Assembly term. The Welsh Ministers will be required to set out their policies for contributing to the sustainable management of natural resources, including climate change in relation to Wales, and to identify what they consider to be the key priorities and opportunities for achieving this. In developing the first statutory NRRP by spring 2017, we propose to build on this policy statement together with our partners. In particular, we will undertake the appropriate appraisals, including a Strategic Environmental Assessment.

The setting of well-being objectives by the Welsh Ministers under the Well-being of Future Generations (Wales) Act 2015 will correspond with the timing for the production of the NNRP. Therefore the well-being objectives can be taken into account by the Welsh Ministers in preparing the NNRP. The first statutory NNRP, while setting out the Welsh Government's priorities in relation to the management of natural resources as a whole, will point to the WNMP as the framework for sustainably managing Wales' marine natural resources.

Area Statements will be produced by NRW for the purposes of implementing one or more of the priorities and opportunities outlined in the NRRP at an appropriate spatial scale. An area statement will translate the high level strategic priorities while taking account of local need, opportunities and pressures. A statement will identify

potential opportunities and priorities at a local level and possible collaboration and engagement opportunities for different bodies to work together and encourage active participation in the delivery of the sustainable management of natural resources at a local level and across different stakeholders.

Public Services Boards (PSBs), established under the Well-being of Future Generations (Wales) Act 2015, will be required under the Bill to take account of area statements (within their area) when preparing local well-being assessments. Public bodies under the Well-being of Future Generations (Wales) Act 2015 will be required to report annually on the progress they have made on meeting their well-being objectives, to assist them in this exercise they could call upon area statements in relation to reporting on progress. The Future Generations Commissioner will publish a report on the assessment of the improvements that public bodies should make in order to set and meet well-being objectives. NRW could call upon this report in the preparation of area statements. The Well-being of Future Generations (Wales) Act 2015 allows for the revision of well-being objectives, if the Welsh Ministers revise their objectives. NRW may voluntarily choose to review area statements in line with the revised well-being objectives. Other public bodies will also be required to contribute to the delivery of the Bill. Public bodies (in line with the public bodies covered by the Act), where requested by NRW can provide information or assistance to NRW to help with the preparation and publication of area statements. A public body may also assist with the implementation of an area statement.

6.1 The Planning (Wales) Act

The Planning (Wales) Act will create an efficient process to ensure the right development is located in the right place. The planning system is central to achieving sustainable development and land use in Wales. Planning policy provides for a presumption in favour of sustainable development to ensure that decision-makers balance and integrate social, economic and environmental issues at the same time when taking decisions on individual planning applications. The Planning (Wales) Act is predicated upon a positive enabling planning system that facilitates appropriate development to deliver the homes, jobs and infrastructure Wales requires, as well as protecting the natural and historic environment both now and in the long term. The Planning Act introduces for Wales the requirement to produce a National Development Framework which is to be produced every five years. The Act also introduces the designation of strategic planning areas as well as the preparation of strategic development plans. Whilst there is a requirement for each plan to specify the period for which it is to have effect, unlike the Well-being of Future Generations (Wales) Act 2015 and the Environment (Wales) Bill the timetable will be prepared by the Strategic Planning Panel. These provisions will come into force by a Commencement Order.

6.2 The Historic Environment (Wales) Bill

The Historic Environment (Wales) Bill will introduce measures to improve the protection and sustainable management of scheduled monuments and listed buildings in Wales. It will also give statutory status to the existing register of historic parks and gardens in Wales. The Bill will be complemented by planning policy and advice and a suite of best practice guidance to support the careful management of change in the wider historic environment in line with current conservation philosophy and practice. Since there is often no clear demarcation between the natural and historic environments in Wales, well-informed and sustainably managed change will benefit both.

Annex A: Summary from State of the Environment Report

The State of the Environment (SOE) Report was an annual indicator report to monitor progress against the Welsh Government's *Environment Strategy*¹⁸, both of which are now superseded by the Environment (Wales) Bill. The SOE reported on 100 indicators and served to track progress against the 39 outcomes of the Environment Strategy. Each indicator was awarded a "traffic light" status (see Figure 4). The assigned status was based on the long-term trend over all the available data for each indicator, not just data for the reporting year.

Figure 4: Indicator status



Indicators in the report were arranged by the following six environmental themes: Enabling change, addressing climate change, sustainable use of resources, distinctive biodiversity, landscapes and seas, our local environment and environmental hazards.

The SOE report was produced as a Statistical Bulletin by the Welsh Government Statistical Directorate. The full report published detailed information on data sources and methodology alongside each indicator and can be accessed at:

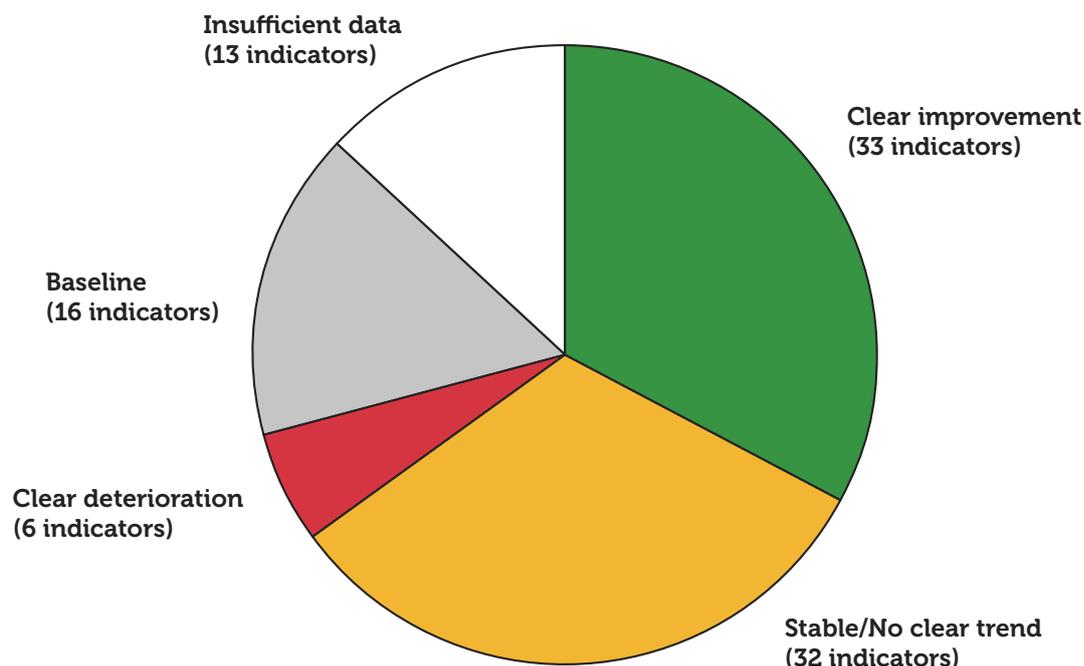
<http://wales.gov.uk/docs/statistics/2012/120725stateofenvironment12en.pdf>

The final SOE Report for Wales was published in 2012.

Of the indicators that have been defined and where the information exists, the 2012 SOE report showed a clear improvement in 46% of indicators, while 45% remained stable or showed no clear trend. 8% of indicators showed a clear deterioration.

¹⁸ <http://wales.gov.uk/topics/environmentcountryside/epq/envstratforwales/?lang=en>

Chart 1: Summary of progress across SOE indicators, 2012



Examples where indicators have shown an improvement in Wales are:

- **Waste:** The percentage of municipal waste that is recycled and composted has shown continuous improvement. From a baseline figure of 4.8% in 1998–99, the percentage of municipal waste recycled or composted in Wales reached 45.3% in 2010–11.
- **Water:** Water resources are being managed more sustainably, evidenced in part by a downward trend in water leakage, from 249 megalitres per day in 2001–02 to 202 megalitres per day in 2010–11.
- **Local environment:** The number of fly-tipping incidents has shown a downward trend since 2008–9, with 41,750 incidents recorded in 2010–11. This compares to a peak of 61,995 incidents in 2007–08.
- **Access:** The proportion of footpaths and other rights of way surveyed which were easy to use in Wales increased from 41% in 2005–06 to 55% in 2010–11.
- **Environmental Management:** There has been an increase in the number of organisations adopting the Sustainable Development Charter, rising from 36 organisations in December 2010 to 130 as of July 2012. Signing the Sustainable Development Charter commits organisations to making sustainable development their central organising principle.

In relation to the main environmental themes, key findings include:

Enabling Change

There has been a continued effort by public and private bodies in Wales through incentives and information campaigns to achieve behavioural change at an organisational and individual level.

Addressing climate change

Over the period 1990–2008, greenhouse gas emissions in Wales have decreased although there is significant annual variation. 2008 saw a slight increase in greenhouse gas emissions in Wales compared to 2007, although an overall downward trend since 1990 remains. This is primarily due to the re-opening of the Aberthaw power station during 2008. Power stations are the largest greenhouse gas emissions source in Wales and therefore any changes in their activity can result in fluctuation in the overall figures. Wales remains a “net exporter” of electricity to England.

Reductions in greenhouse gas emissions from 2007–8 occurred across many other sectors, including a slight decrease for transport. Net emissions from land use, land use change and forestry continue the recent trend of little change. This reflects the general stability of land-use in Wales and the mature nature of many forests. Further details are set out in the Welsh Government’s recent progress report on climate change, found at:

<http://wales.gov.uk/docs/desh/publications/140107climate-change-annual-report-en.pdf>

For the latest emission reduction figures for Wales, please see the Welsh Governments 2014 Climate Change Annual Report, which sets out progress made against our headline commitments against emission reduction and adaptation and summarises some of the key activity that has been taken forward.

<http://gov.wales/topics/environmentcountryside/climatechange/publications/2014-climate-change-annual-report/?lang=en>

Sustainable Use of Resources

The indicators of the sustainable use of resources continue to show some positive trends for municipal waste, indicating the success of the Waste Strategy¹⁹, which focuses particularly on measures to reduce municipal waste and improve its management. There are also positive trends in more efficient use of water driven by targets to the water industry. For example, the level of leakage as a percentage of water supplied in Wales has decreased, and the volume of water abstracted from the environment has decreased. Water companies are better prepared to deal with changes in supply and demand as the percentage of water resource zones meeting target headroom has also increased.

Our Local Environment

The total recorded number of fly tipping incidents in 2010–11 has decreased to the lowest level since 2006–07.

The percentage of people stating that they could easily access a park or open space has dropped but remains at a high level (85.9% in 2009–10), and the percentage of total length of footpaths and other rights of way which were easy to use by the public has increased.

¹⁹ http://wales.gov.uk/topics/environmentcountryside/epq/waste_recycling/publication/towardszero/?lang=en

Environmental Hazards

Emissions of air pollutants continue to show positive trends, with many pollutants reducing year-on-year.

Distinctive biodiversity, landscapes and seascapes

The most up to date biodiversity data (2012) relates to the index measuring the Short-term abundance of widespread breeding birds in Wales, which began in 1994 (1994=100). The index peaked at 113 for all species in 2000. The all species index fell below 100 for the first time in 2009. The other, urban and wetland species sub-group peaked at 136 in 2004 before declining. The farmed habitats sub-group has remained at or below 93 since 2006 and fell to a new low of 84 in 2009.

The indices for 2010 and 2012 are as follows:

- All species (59 species) 110 (2010) and 108 (2012)
- Birds of farmland habitat (19 species) 100 (2010) and 85 (2012)
- Woodland birds (26 species) 113 (2010) and 125 (2012)
- Urban and other birds (14 species) 117 (2010) and 113 (2012)