

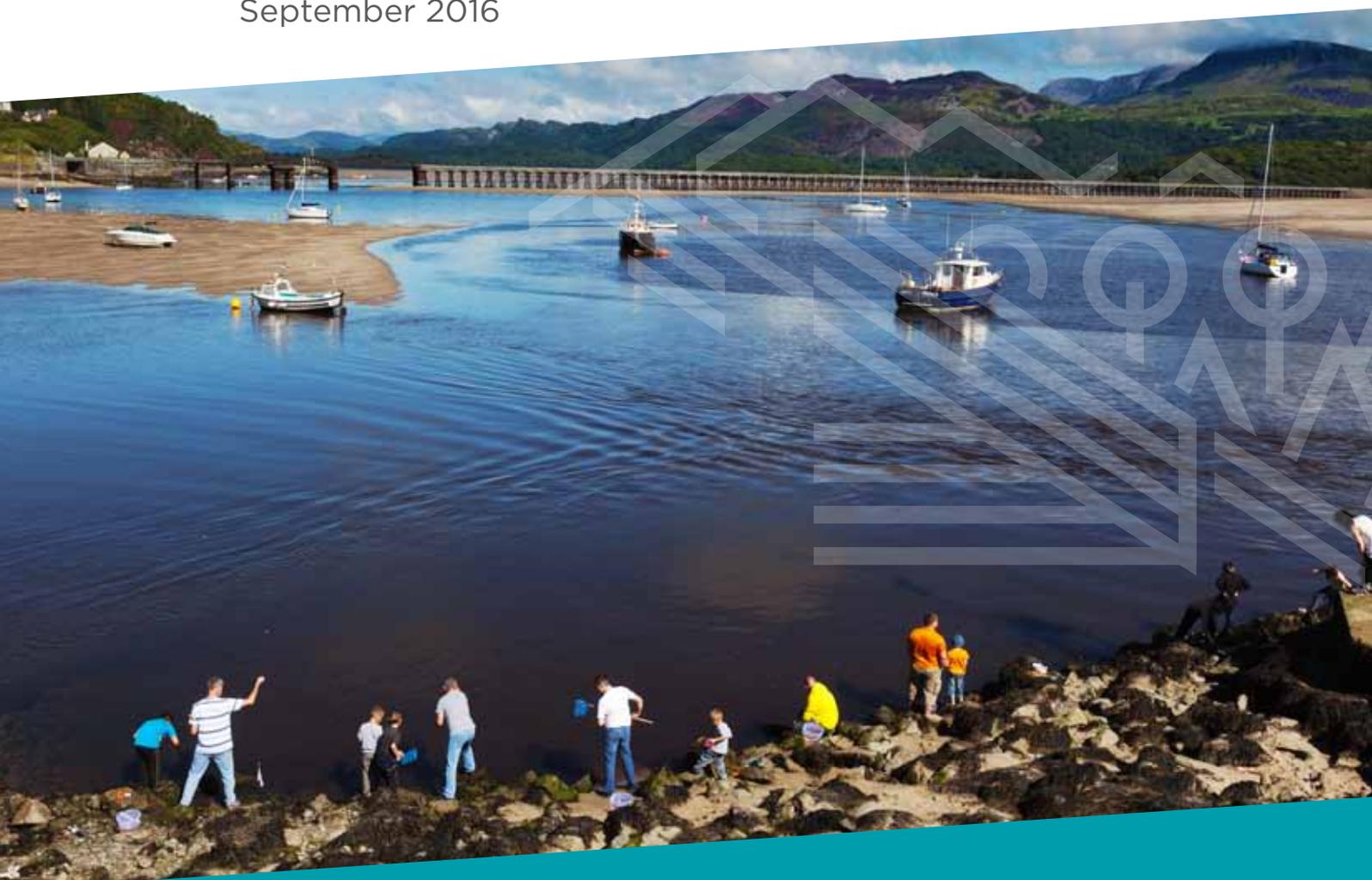


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Wales

A summary of the State of Natural Resources Report:

**An assessment of the sustainable
management of natural resources**

September 2016



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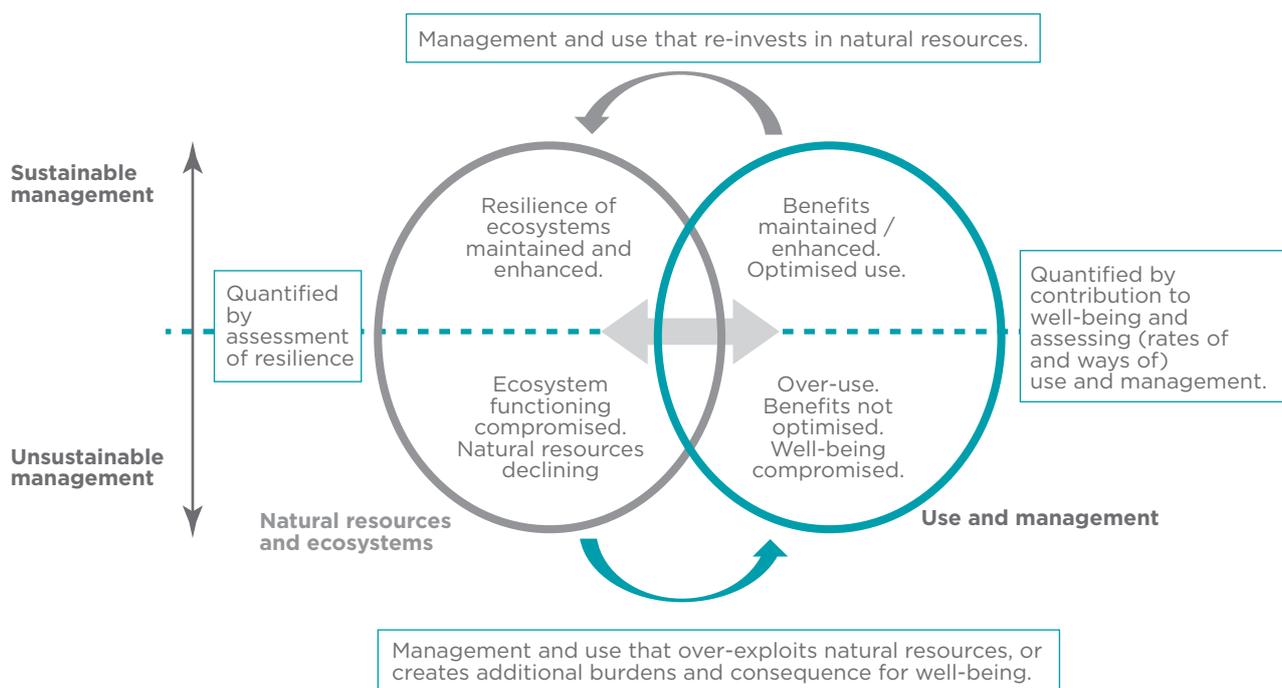
A new approach

This State of Natural Resources Report (SoNaRR) is the first of its kind in Wales.

The approach of **SoNaRR** is ground-breaking. The report sets out the state of Wales' natural resources. It assesses the extent to which natural resources in Wales are being sustainably managed, and recommends a proactive approach to building resilience. And - for the first time - the report links the resilience of Welsh natural resources to the well-being of the people of Wales.

In this report we look at how pressures on Wales' natural resources are resulting in risks and threats to long-term social, cultural, environmental and economic well-being, as set out in the Well-Being of Future Generations (Wales) Act 2015. We look at the key issues, as well as opportunities for integrated solutions that provide multiple benefits.

Throughout the report, we highlight where there are gaps in evidence. We also indicate our level of confidence in the evidence that we have used.



Start of a journey...

Based on the evidence in **SoNaRR**, Welsh Ministers will set out their priorities for policy to address the sustainable management of natural resources. Area statements will be developed by Natural Resources Wales (NRW) with our partners and stakeholders to put this policy into action.

This is the start of our journey. The way we report on the state of natural resources will develop and evolve over time. NRW wants to work with a variety of partners to improve the way we assess how Wales is managing its natural resources. We want to hear if there is evidence we have overlooked, and what people think of our assessments of resilience and risk.

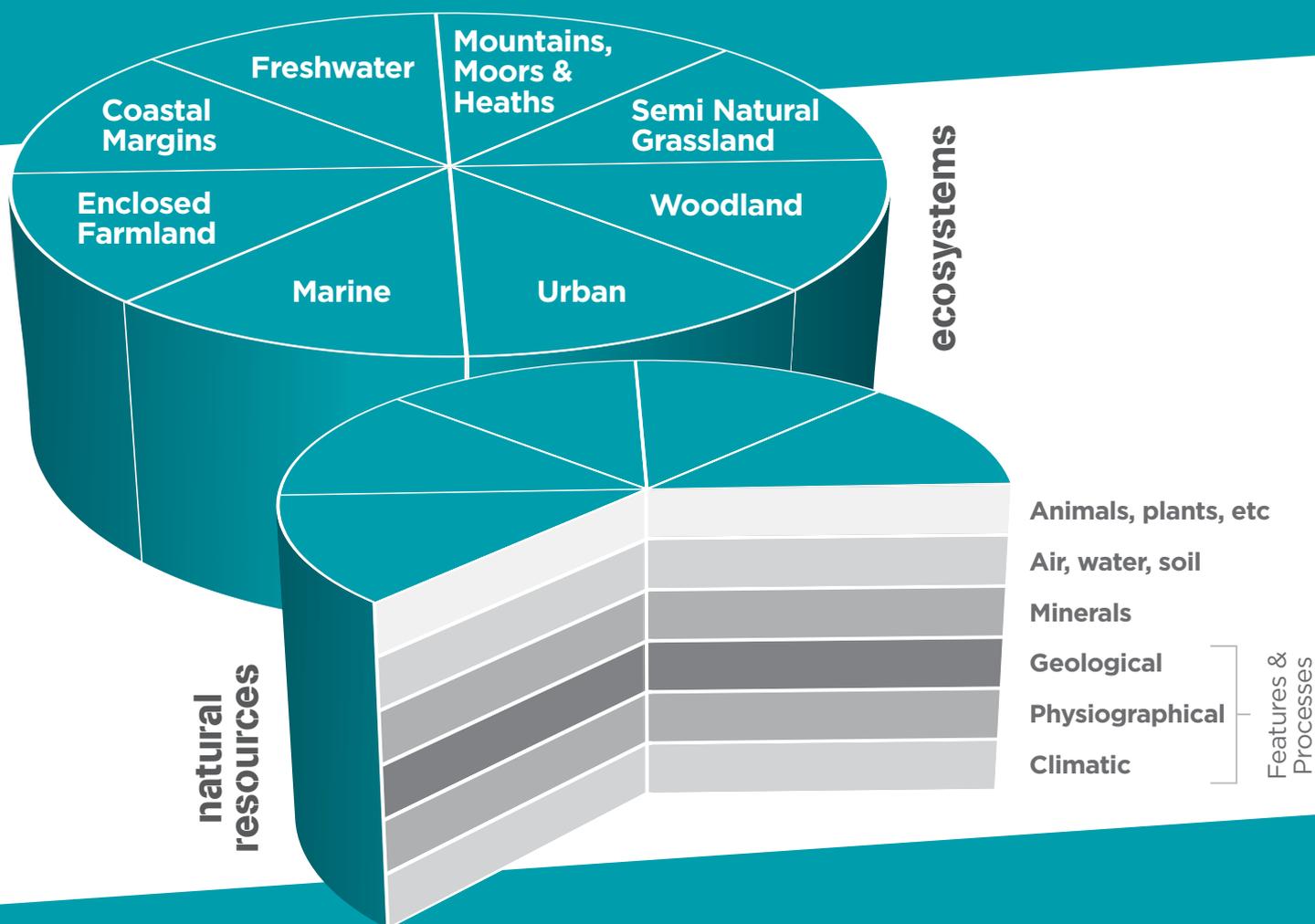
By working together, we can improve our understanding of what we all need to do to confront the challenges ahead – in particular, the risks presented by climate change and the threats to biodiversity.

From Government to public sector to businesses to individuals – we all need to play our part. Together, we can build the resilience of natural resources and well-being in Wales.



Why are natural resources important?

Wales' natural resources and ecosystems are at the heart of everything we do. Natural resources – our air, land, water, wildlife, plants and soil - provide our most basic needs, including food, energy and security. They help to keep us healthy.



When natural resources flourish, society and the economy thrive as well. Natural resources and ecosystems can help us to reduce flooding, improve air quality and supply materials for construction. They also provide a home for a variety of wildlife, and give us iconic landscapes to enjoy, which also boosts the economy through tourism.

However, our natural resources are coming under increasing pressure – from climate change, a growing population and the need for energy production. Wales faces many challenges: securing low-carbon energy and fuel supply, creating jobs and income, tackling poverty and inequality, flooding and drought, and improving people's health.

Poorly managed natural resources and ecosystems increase the long-term risks to our well-being. Improving Wales' management of natural resources means that we will be better able to tackle these challenges.

We all need to look after our natural resources and ecosystems so they can continue to provide us with the things we need. Any decisions we make can have a knock-on effect on the environment as a whole, now and for many generations to come.

Economic, social and cultural benefits...

Wales' natural resources provide us with many economic, social and cultural benefits. For example:

- **£385 million** from **agriculture** to the Welsh economy every year. This figure underpins the £6.1 billion annual turnover and £1.55 billion gross value added attributed to the on-farm production and food manufacturing sector.
- **951 million litres** of **drinking water** per day.
- **1.5 million tonnes** of **green timber** a year, making construction easier and cheaper.
- **£499.3 million** from the **forestry sector*** to the Welsh economy (*covers forestry and logging, manufacture of wood and products of wood and cork, and manufacture of paper and paper products).
- **14 million tonnes** of **aggregates** per year, for construction and other uses.
- **8,919 gigawatt hours** of energy from **renewable sources**, and rising, creating a renewable energy industry that employs 2,000 people.
- **410 million tonnes** of **carbon** stored in soil to soak up emissions and protect against climate change.
- **£2,870 million** in **tourism** to Wales.
- **28% of adults** meeting the recommended level of **physical activity** through outdoor pursuits.
- **£18.2 million** in **health benefits** to people from walking the Wales Coast Path.
- **£840 million** and **30,000 jobs** from the **historic environment sector**.



Constant change...

Wales' natural resources are in a state of constant change. This has led to challenges such as pollution and climate change and damage to the ecosystems that provide us with the things we need.

These impacts are the result of the choices people make every day. They present a risk to the resilience of Welsh ecosystems, which will impact on people's well-being both now and in the future.

To ease these pressures, we need to do things differently.



The state of Wales' natural resources

Wales covers a land area of **2,078,224 ha**. Our land supports our agricultural industry and provides a home for a variety of wildlife. Habitats help define the landscape of Wales with iconic elements, such as our dramatic coasts and uplands, extensive woodlands, marshland and heaths, rivers and lakes, and our extensive farmland.

The Welsh marine area is vast, covering **41%** of the territory of Wales. This includes part of the Irish and Celtic seas and Western Channel, and is also home to many different habitats and species.

The full report looks in detail at the state of Wales' natural resources, including animals, plants and other organisms, air quality, water resources, soils and minerals. It also looks at the condition of Welsh ecosystems, such as mountains, grasslands, woodlands, urban, freshwater and marine environments.

Decades of work to understand and protect our natural resources have taken us a long way. Today, our rivers and beaches are cleaner, and our air is fresher. Our beautiful landscapes provide the people of Wales with world-class leisure and nature opportunities, and attract millions of tourists every year.

However, there are between **40,000** and **50,000 early deaths** in the UK every year due to air pollution. Many of our plants and wildlife are in decline. Wales - along with the rest of the UK and other countries - failed to meet its 2010 international and national biodiversity targets, and the decline has continued in many cases.

We are also seeing changes in the amount of rainfall and increased flood risk. The expansion of Wales' towns and cities and the trend of paving over gardens has reduced the ability of urban areas to soak up rain, reduce flooding, and provide a home for wildlife and greenspace for people. Being further from greenspace also impacts people's physical and mental well-being.

Wales has worked hard to find solutions, but more work remains. This report presents an opportunity to set out the evidence on the resilience of our natural resources, show the risks to well-being, highlight new opportunities to develop, and encourage people to work together to better manage our natural resources.

While Wales clearly faces significant challenges, we can make improvements: safeguarding carbon stores to protect against climate change and soak up future emissions; maintaining food-producing capabilities; reducing the risk of flooding; retaining the distinctiveness of our landscapes; and improving the quality of our water and the connectivity of our habitats to enable species to move locations in order to survive.

Managing natural resources differently will enable us to improve their resilience.



What does ecosystem resilience mean?

'Ecosystem resilience' means how well ecosystems can deal with disturbances - either by resisting them, recovering from them, or adapting to them. Resilient ecosystems are able to carry on delivering services and benefits despite these disturbances.

If they are not resilient, ecosystems aren't able to work and deliver services and benefits. For example, if a woodland is planted only with trees of a single species and age, it is possible that all the trees could die from a single disease. The woodland would then not be able to deliver timber, carbon storage, recreation, and many other valuable services and benefits.

Wales's new natural resources legislative framework aims to build resilient ecosystems so that they can provide additional benefits to people's well-being.

In this report, resilience is considered in terms of diversity, extent, condition, connectivity and adaptability, which are based on the attributes described in the Environment Act.

Ecosystem resilience in Wales...

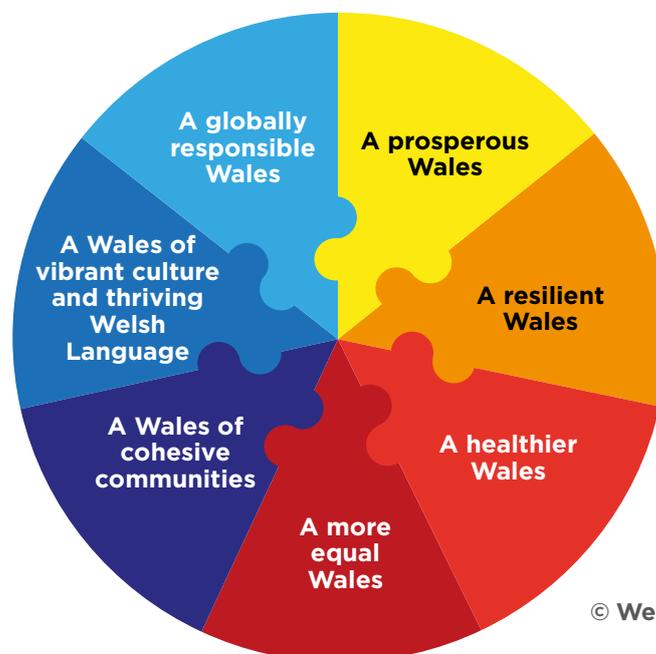
Overall, **diversity** is declining, which is shown by loss of habitats and species. The 'extent' of some habitats has also declined significantly. 'Condition' shows mixed results, while 'connectivity' has greatly reduced.

All ecosystems have problems with one or more attributes of resilience. This means that their capacity to provide ecosystem services and benefits may be at risk. No ecosystem, on the basis of our assessment, can be said to have all the features needed for resilience.

We need action to build resilience and adaptive management of our natural resources.

Natural resources and well-being – connecting the dots...

The Well-being of Future Generations (Wales) Act 2015 sets out seven well-being goals that describe 'the kind of Wales we want to see'. SoNaRR considers how natural resources and ecosystems support these seven well-being goals. This is the first time that this analysis has been done.



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How natural resources support the seven well-being goals

Below are just some examples of the huge contribution that natural resources make to well-being....

- 1 A Resilient Wales** – Biodiversity, mountains, moorlands and heaths, semi-natural grasslands, woodlands, urban greenspaces, rivers, streams, lakes and wetlands, coastline, and marine ecosystems all contribute to supporting Wales’ ability to adapt to climate change.
- 2 A Prosperous Wales** – Natural resources provide opportunities for employment and economic activity. For example, wildlife and outdoor activity tourism to Wales provides around 206,000 jobs and is estimated to be worth £6.2 billion. In 2013, over 3.5 million visitors to our coastline brought £602 million to the economy, with growth predicted at 10%. Wales’ three National Parks attract 12 million visitors every year who spend £1 billion on goods and services.
- 3 A Healthier Wales** – Natural resources make a significant contribution to the physical health and mental well-being of people in Wales. For example, trees help to absorb pollutants and improve air quality, which if poor can impact on people’s health. Access to nature and greenspace has positive impacts on physical and mental health.
- 4 An Equal Wales** – Equal access to ecosystems providing cultural services contribute to equality in Wales. We want to minimise negative and maximise positive impacts for everyone. At present, access is not equally distributed (for example, not everyone lives close to greenspace, and some people live in areas with better air quality than others.)
- 5 A Wales of Cohesive Communities** – Involving communities in the management of their local parks and woodlands has been shown to improve community cohesion and reduce antisocial behaviour.
- 6 A Wales of Vibrant Culture and Thriving Welsh Language** – Landscapes have played a significant role in the development of distinct cultural practices, such as local building techniques relying on local materials, along with locally specific art and literature.
- 7 A Globally Responsible Wales** – The environment supplies all our material resources but we must ensure that we use only our fair share.

From the environment to jobs, health to equality, culture to resources...even to tackling anti-social behaviour...natural resources clearly make a significant contribution to well-being in Wales.

Identifying unsustainable management...

The use of most, if not all, of Wales' natural resources is regulated or managed. However, there are weaknesses or gaps in the regulatory framework and management, and in information that informs decision-making. These could create potential issues for the resilience of ecosystems and the benefits they provide.

SoNaRR explores whether we are using and managing natural resources sustainably. To do this, it uses the following criteria:

- Natural resources are continuously declining or are being used faster than can be replenished;
- The health and resilience of our ecosystems is being compromised - this includes targets not being met, or 'limits' in danger of being breached;
- The benefits from ecosystems services are not being optimised;
- The contribution to well-being of ecosystem services is not meeting our basic needs, or is declining.



We have chosen to consider the following activities that reflect the breadth of natural resource management:

- 1 Waste** - While Wales is performing well against Welsh Government Towards Zero Waste goals and statutory targets, there are still significant opportunities to reduce, reuse, recycle, and recover waste across Wales. By doing so, businesses will realise significant cost savings. Improving waste management will also reduce greenhouse gas emissions which contribute to climate change. This would deliver environmental, health and social well-being benefits.
- 2 Water** - Wales is not yet managing water sustainably. This poses risks such as less water availability for agriculture, businesses and homes, poorer water quality, flooding and drought, and risks to fisheries, river ecology, and recreation. These risks could lead to increased costs. For example, in 2015, flooding of major road and rail links, and loss of electrical cables and gas pipes caused disruption to communities and additional costs for utility companies.
- 3 Air** - There are gaps in the management of Wales' air quality that continue to impact on ecosystems and well-being. For example, traffic is the biggest polluter in our urban spaces. Increasing our understanding of how urban environments affect traffic pollution, and the impact on health, will help planners improve traffic controls and the design of urban space.
- 4 Soil and Land** - We need to increase understanding of the importance of soil and condition across all land uses. Managing soils and land use more effectively would reduce our risk of not being able to grow food and have a clean water supply, a stable climate, and many other important benefits.
- 5 Woodland** - Forecasts predict a drop in timber availability if we do not create new woodland and bring more woodland into management. This poses a risk to wood supply and the wider benefits that woodlands provide. Many of these benefits are taken for granted and are under-valued, such as carbon storage to protect against climate change. So there is less incentive for land managers to consider their value when making land-use decisions. This could impact on ecosystem services delivered by woodlands and on future well-being.
- 6 Energy** - It is important to save energy and find ways to generate electricity at lower environmental costs. If we tackle this, we will ensure that future generations will be able to access energy. We will be able to reduce greenhouse gas emissions and begin to address climate change, wider environmental loss and pollution issues, and their impacts on well-being.
- 7 Urban environments** - It has been difficult to build a full picture of the management of our urban systems. This is a gap that needs to be addressed. If Wales takes an integrated approach to managing urban systems, we will be able to maximise the benefits that green infrastructure provides, and so reduce risks and costs to well-being.
- 8 Seas and coast** - Much legislation about the management of the marine environment is new, and it is not yet possible to evaluate its success. Our focus is now on the integrated management of where land and sea meet.

To sum up...

It is clear that a range of issues, which are difficult to manage or regulate, is contributing to reducing the resilience of Wales' ecosystems. This affects the delivery of ecosystem benefits, which in turn impacts on people's well-being.

In summary, our actions as a society are lowering our and future generations' quality of life.

The full value of natural resources and ecosystems is not being adequately taken into consideration in various decision-making processes. Under the Environment Act, Wales now has the opportunity to address this disjointed system and take a more integrated approach.

Towards the sustainable management of natural resources

SoNaRR is not designed to identify fully worked up solutions to the risks and opportunities identified in our analysis. We do make suggestions about how Wales can take a more integrated approach to managing natural resources sustainably - one that looks at the whole picture rather than focusing on individual parts. We have identified risks to well-being through a natural resource and well-being Risk Register. This is a new approach for Wales.

The Risk Register will allow policy makers and other stakeholders to consider key risks to the resilience of Wales' natural resources and the benefits they provide.

It clearly shows the connections between ecosystems and well-being, and the potential risks if ecosystems are not resilient. It is designed to be used in conversation with others - to explore which risks are of greatest concern. These conversations will be important to gather more evidence about where risks are occurring, or are most likely to occur. Priorities can then be set, and solutions developed that help to address and manage the risks of most concern.

NRW recommends further strengthening the Risk Register by considering where there are opportunities to manage natural resources in a way that delivers multiple benefits.

It is important not to consider solutions for each individual risk in isolation. Wales should develop integrated solutions that contribute as much as possible to the well-being goals.



Let's look at flooding...

It's helpful to build a picture, as demonstrated by the example of flooding.

The maps presented in SoNaRR show:

- Natural features that contribute to flood management (such as deep-rooting trees);
- Areas that may be contributing to flood risk (such as steep slopes or soil with limited water-holding capacity); and has been produced for Wales.
- Opportunity areas for interventions to reduce flood risk (such as areas where trees can be planted).

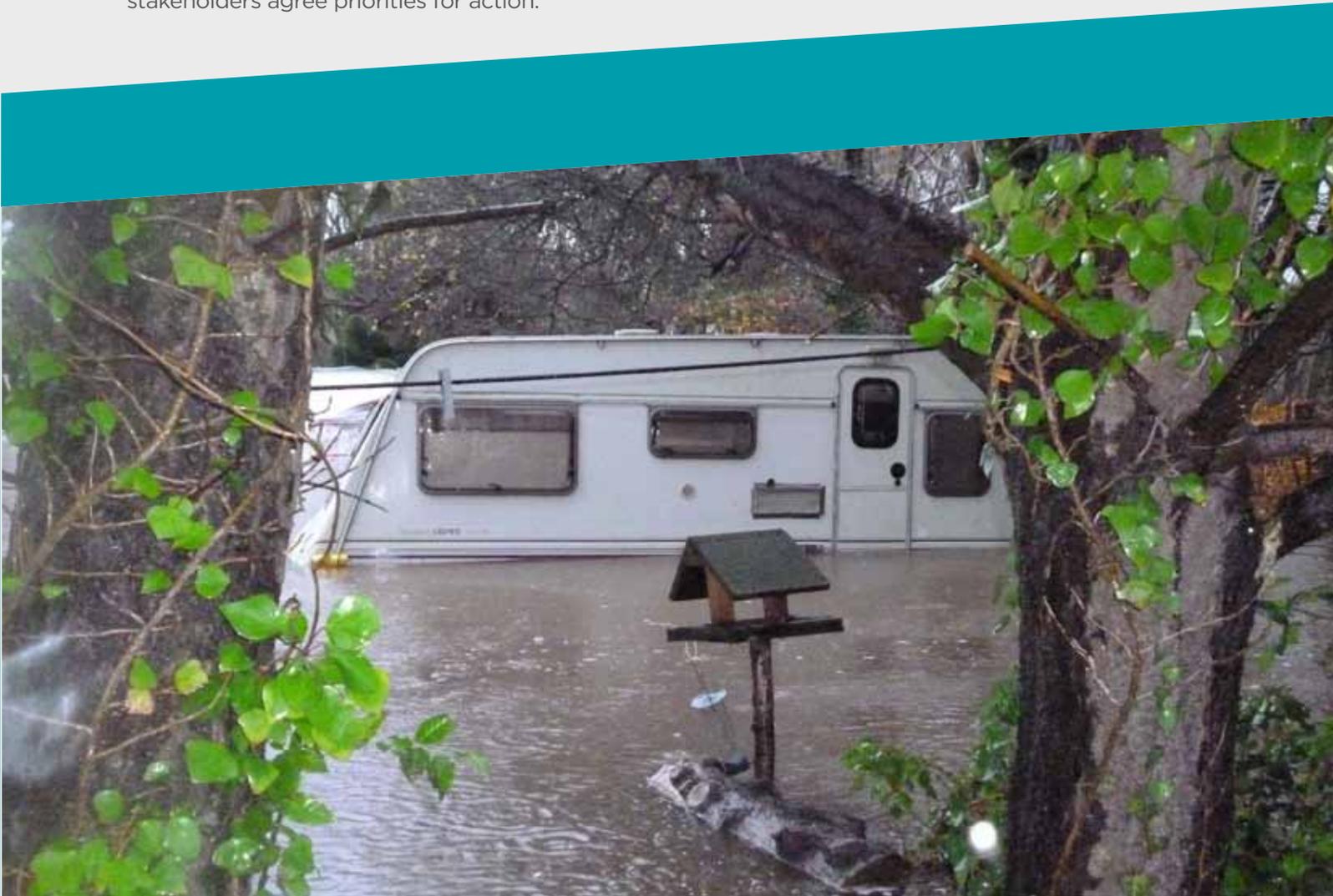
The advantage of this type of spatial approach is that other ecosystem benefits can easily be added to the analysis. This allows additional action to be identified to produce multiple benefits.

For example, as well as flood mitigation opportunities to protect people and property, the case study looks at opportunities to control soil erosion (for more effective crop growing and other uses) and to maintain soil carbon stores (to help tackle climate change).

Finally, local knowledge and community engagement is essential to making sure interventions are in the most appropriate locations and done in a way that supports well-being. Through discussion and engagement we can decide on the most significant risks to resilience, and find tailored solutions.

NRW believes these approaches are critical in dealing with the complexities of natural resources and ecosystems, and their contribution to well-being. We intend to build on these approaches further through engagement, dialogue, and collaboration with stakeholders.

When the first round of Area Statements have been completed, our knowledge about where risks to resilience and well-being are located will feed into the next SoNaRR. This will help stakeholders agree priorities for action.



Highlighting opportunities for policy

Throughout the report, a number of areas have emerged which we believe provide the greatest opportunity to deal with the challenges and risks identified, and contribute to the well-being goals. Evidence presented on the opportunities will be considered for the National Natural Resources Policy and in the preparation of Area Statements. The areas that have emerged are:

	Declining natural resources	Resilience of ecosystems	Optimising benefits	Minimising negative impacts
Green infrastructure in and around urban areas		Contribute to connectivity within and between ecosystems	Multi-benefits of urban green-spaces such as water filtration, accessible places for health and recreation, connecting habitats, and supporting opportunities for community cohesion	Tackling health inequalities and air quality
Increasing woodland cover, and bringing more of our existing woodlands into appropriate management	Will address woodland resource	Contribute to diversity and connectivity of woodlands	Multiple benefits of woodland, including health and recreation benefits, fibre and fuel, and wider catchment management opportunities	
Coastal zone management and managed realignment	Addressing coastal squeeze	Supporting coastal habitat	Supporting coastal communities, for example through providing opportunities for tourism and employment	Future proofing from coastal flooding / sea level rises
Maintaining, enhancing and restoring floodplains and hydrological systems	Water availability	Capacity of catchments to deal with high and low flows; supporting water quality	Supporting recreation and economic activity	Flood risk Social cohesion, equity/local economy
Better soil management	Investment in soils for future productivity	Soils underpin everything	Preventing erosion, supporting other habitats and benefits	Erosion, costs of water treatment etc
Utilisation of our uplands to deliver multiple benefits	Restoring peatland, safeguarding carbon stores	Wider resilience of upland and lowland habitats and species that depend on them	Making better use of Wales natural assets	Tackling climate change; reducing flood risk

As a society, we need to seize these opportunities and take them forward

Next Steps

It is our hope that this report will enable policy makers and decision-makers in other parts of the public sector to begin to consider the key risks to the resilience of our natural resources and the benefits they provide.

NRW will develop this approach further. We intend to...

- Develop better measures to enable us to assess level of risk, and contribution to well-being;
- Develop our approach to assessing resilience at different scales, using mapping tools and ways of assessing 'value';
- Continue to improve our understanding of the links between natural resources, ecosystem resilience, and well-being; and
- Given the imperative for a joined-up approach, to work with other bodies to refine the use of the Risk Register as a support tool for integrated planning.

While this is still work in progress, Wales now has the opportunity to use the new legislative framework and emerging research to improve the approach to management of natural resources. The aim, building on this first report, is to gather the information we need to be capable of feeding into the complex decisions being made on the use of natural resources.



A SoNaRR of firsts...

We hope you have found this first SoNaRR insightful.

It is the first country-wide assessment of the health and resilience of ecosystems. It is the first assessment of the extent to which Wales is sustainably managing its natural resources. It is also the first assessment of the contribution of natural resources to well-being, and confirms a clear link between natural resources and each of the well-being goals. Finally, it is the first time a natural resource and well-being Risk Register has been used in Wales.

We want to hear from you...

We want to hear from you if you have evidence on the state of natural resources in Wales, the resilience of ecosystems, or their contribution to well-being. We also want to hear your ideas on how to improve our assessment and reporting process, which could assist us in developing future SoNaRRs.

1. How could you use the evidence in SoNaRR to help you achieve your goals/objectives?
2. How could you apply the approach to resilience and wellbeing to your particular area of interest? What do you need us to help you with?
3. How can we develop the approaches presented in SoNaRR (such as the natural resources and well-being Risk Register) to make it more helpful for you?
4. What can you offer that will help us to develop the next SoNaRR?

Please contact us at sonarr@cyfoethnaturiolcymru.gov.uk.

The journey continues...

This is just the beginning of our SoNaRR journey to improving the management of natural resources. We cannot reverse long-term trends overnight. We have a once-in-a-generation opportunity.

Taking a joined up approach to the sustainable management of our natural resources will help us to tackle old problems in new ways - to find better solutions to the challenges we face - and create a more successful, healthy and resilient Wales, now and in the future.

Together, we can improve the state of Wales' natural resources, and deliver even more benefits to the people of Wales.

We look forward to hearing from you.

