The Second State of Natural Resources Report (SoNaRR2020)

SoNaRR2020 Register mountains, moorlands and heaths key pressures and opportunities

Natural Resources Wales

Final Report

About Natural Resources Wales

Natural Resources Wales's purpose is to pursue sustainable management of natural resources. This means looking after air, land, water, wildlife, plants and soil to improve Wales's well-being, and provide a better future for everyone.

Evidence at Natural Resources Wales

Natural Resources Wales is an evidence-informed organisation. We seek to ensure that our strategy, decisions, operations and advice to Welsh Government and others are underpinned by sound and quality-assured evidence. We recognise that it is critically important to have a good understanding of our changing environment.

We will realise this vision by:

- Maintaining and developing the technical specialist skills of our staff;
- Securing our data and information;
- Having a well resourced proactive programme of evidence work;
- Continuing to review and add to our evidence to ensure it is fit for the challenges facing us; and
- Communicating our evidence in an open and transparent way.

Title: **SoNaRR2020 Register mountains, moorlands and heaths key pressures and opportunities**

Peer Reviews: Internal and external peer review

Restrictions: None

The Second State of Natural Resources Report (SoNaRR2020) contents

This document is one of a group of products that make up the second State of Natural Resources Report (SoNaRR2020). The full suite of products are:

Executive Summary. Foreword, Introduction, Summary and Conclusions. Published as a series of webpages in December 2020

The Natural Resource Registers. Drivers, Pressures, Impacts and Opportunities for Action for eight Broad Ecosystems. Published as a series of PDF documents and as an interactive infographic in December 2020

Assessments against the four Aims of SMNR. Published as a series of PDF documents in December 2020:

SoNaRR2020 Aim 1. Stocks of Natural Resources are Safeguarded and Enhanced

SoNaRR2020 Aim 2. Ecosystems are Resilient to Expected and Unforeseen Change

SoNaRR2020 Aim 3. Wales has Healthy Places for People, Protected from Environmental Risks

SoNaRR2020 Aim 4. Contributing to a Regenerative Economy, Achieving Sustainable Levels of Production and Consumption

The SoNaRR2020 Assessment of Biodiversity. Published in March 2021

Assessments by Broad Ecosystem.. Published as a series of PDF documents in March 2021:

Assessment of the Achievement of SMNR: Coastal Margins

Assessment of the Achievement of SMNR: Enclosed Farmland

Assessment of the Achievement of SMNR: Freshwater

Assessment of the Achievement of SMNR: Marine

Assessment of the Achievement of SMNR: Mountains, Moorlands and Heaths

Assessment of the Achievement of SMNR: Woodlands

Assessment of the Achievement of SMNR: Urban

Assessment of the Achievement of SMNR: Semi-Natural Grassland

Assessments by Cross-cutting theme. Published as a series of PDF documents in March 2021:

Assessment of the Achievement of SMNR: Air Quality

Assessment of the Achievement of SMNR: Climate Change

Assessment of the Achievement of SMNR: Energy Efficiency

Assessment of the Achievement of SMNR: Invasive Non-native Species

Assessment of the Achievement of SMNR: Land use and Soils

Assessment of the Achievement of SMNR: Waste

Assessment of the Achievement of SMNR: Water Efficiency

Updated SoNaRR evidence needs. Published in March 2021

Acronyms and Glossary of terms. Published in December 2020 and updated in March 2021

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Mountains, Moorlands and Heaths Natural Resource Register

SoNaRR2020

The Natural Resource Registers are an important output of SoNaRR2020.Their purpose is to distil the key pressures and opportunities identified within the chapters and to provide an accessible assessment of SMNR.

The mountains, moorlands and heaths natural resource register is made up of two additional documents:

1. SoNaRR2020 Register mountains, moorlands and heaths assessment of SMNR
2. SoNaRR2020 Register mountains, moorlands and heaths evidence

Table 1 Key Drivers, Pressures and Impacts on the Mountains, Moorlands and Heaths Ecosystem

Driver	Pressure	Impact
Climate Change	1. Changing Weather Patterns	1.1. Loss of carbon and habitat deterioration from drained / drought soils, more surface run-off and erosion Confidence Assessment: MEDIUM SMNR Aim 1 and 2 1.2. Higher natural tree-line and upward drift of species. Reduction of montane habitat climate envelope. Likely to cause the loss of plant and bird species including loss of C-sequestration potential from peat forming species Confidence Assessment: Low SMNR Aim 1 1.3. Increased risk of wildfires Confidence Assessment: MEDIUM SMNR Aim 2 and 3 1.4. Increased risk of flooding Confidence Assessment: HIGH SMNR Aim 2 and 3
Pollution	2. Air Pollution	2.1. Leads to profusion of nitrophilous species, direct toxicity effects on some species, reduction in plant species richness and changes to vegetation structure which may

		enhance carbon loss. Confidence Assessment: HIGH SMNR Aim 1, 2 and 3
Pollution	3. Water Pollution	3.1. Inorganic nitrogen concentrations in groundwater is an issue for many lowland peatlands leading to profusion of nitrophilous species, reduction in plant species richness and changes to vegetation structure which may enhance carbon loss. Confidence Assessment: HIGH SMNR Aim 1, 2 and 3
Land Use Change	4. Insufficient Management	4.1. Causing changes in species composition and structure, e.g. profusion of dominant species at expense of delicate species, but also including natural colonisation of woodland and carbon sequestration. Confidence Assessment: HIGH SMNR Aim 1 and 3
Land Use Change	5. Agricultural Intensification	5.1. Causing simplification of ecosystem for singular productive use, but general loss of biodiversity. May affect soil and hydrological properties, aesthetics and other land uses. Confidence Assessment: MEDIUM SMNR Aim 2 and 3
Land Use Change	6. Historic Inappropriate Afforestation	6.1. Causing habitat and biodiversity loss and ecosystem change, Potential for habitat improvement. landscape change and impacts on carbon storage and sequestration, hydrological (which may be positive or negative) and delivery of fibre. Confidence Assessment: HIGH SMNR Aim 2, 3 and 4
Land Use Change	7. Unmanaged Access, Sport and Recreational Activity	7.1. Creating localised disturbances, changes and degradation, GHG emissions associated with ancillary actions (transport, accommodation). Confidence Assessment: LOW SMNR Aim 2

INNS, Pests and Disease	8. INNS	8.1. Threatening the condition, extent and, connectivity and condition of the ecosystem. Threaten ecosystem service delivery. Confidence Assessment: HIGH SMNR Aim 2
Over-exploitation	9. Drainage	9.1. Habitat change, increased run-off, Greenhouse Gas emissions, grazing stock losses Confidence Assessment: HIGH SMNR Aim 2, 3 and 4

Opportunities for Action

Aim 1: Stocks of Natural Resources are safeguarded and enhanced

Increase awareness and education about the condition of the ecosystem.

Deliver ecosystem recovery through sustainable agricultural practices.

Manage protected sites towards favourable conservation status, enabling these sites to 'function as core areas of a resilient ecological network'.

Address peatland restoration to repair its hydrological integrity.

Restore the natural altitudinal tree line where appropriate.

Support Nitrate Vulnerable Zones where appropriate and additional measures to protect highly vulnerable sites.

Undertake research within the ecosystem to better understand the structure, function, fertility and nutrient cycles of its soils and historical changes therein.

Improve condition monitoring of protected areas to understand change in status at individual management unit. Develop simple, robust assessment tools to enable land managers to self-monitor against habitat standards.

Avoid rotational burning on upland peatlands.

Aim 2: Resilient Ecosystems

Manage protected sites towards favourable conservation status, enabling these sites to 'function as core areas of a resilient ecological network'.

Maintain and enhance habitat outside protected sites, particularly Priority Habitat, (s7 Environment (Wales) Act 2016) which must, at very least, be protected from loss and damage.

Restore priority habitat, including blanket bog from plantation, heathland from acid grassland.

Establish local community examples to demonstrate ecosystem resilience at appropriate scales.

Establish incentives to encourage cooperation between neighbouring holdings on peatlands.

Use citizen science to collect INNS data, and community engagement to undertake INNS management.

Aim 3: Healthy Places for People

Extend native woodland onto dense bracken, ffridd and streamsides, lowland heathland on the first field behind the coast and nutrient buffer zones around lowland peatlands to improve overall resilience of the ecosystem.

Plant 'the right tree in the right place' can provide multiple benefits for SMNR and well-being as well as being a critical part of meeting Wales' emissions reduction. There are opportunities for natural catchment management to reduce flood and drought risk to slow down surface water flow by creating or restoring riparian and/or floodplain woodlands, providing land for upstream winter overflow and improving riparian habitats throughout water catchments to collectively reduce the risk of flooding and drought to downstream communities. Seek opportunities for woodland restoration by natural regeneration.

Seek opportunities for woodland restoration by natural regeneration.

Increasing roughness within the ecosystem to further increase attenuation of water run-off from the uplands.

Catchment management solutions. Maintain, enhance and restore the areas of the catchments that capture and accommodate within the upland and lowlands. Hydrological systems deliver ecosystem resilience and multiple benefits such as reduced risk of flood and drought and improved water quality and supply.

Sustainable Land Use and Land Management Change. Create a coherent and integrated approach to land use and management change priorities across all ecosystems at appropriate scales. This could help to support place-based delivery for our Public Services Boards and via Area Statements.

Establish an integrated approach to managing recreational pressures to ensure sustainable use of the MMH habitat resource. Assess the impacts of large Challenge Events and specific activities on key habitats and species to inform decisions and management.

Address public access issues which are discouraging grazing of lowland peatlands, heathlands. Examples include resolving issues between the public and farmers such as,

livestock harassment by dogs. Reducing fragmentation and abandonment on coastal and lowland heath caused by recreational conflicts.

Aim 4: A Regenerative Economy

Actively pursue measures to reduce air pollution, particularly NOx emissions.

Reduce the stocking levels in the uplands.

Assist grazing in small lowland, heathlands and peatlands.

Continue the peatland action programme.

Emphasise the need for mixed grazing on the uplands.

From Land Use and Soils Chapter
Develop sustainable standards for agriculture. To balance the improvement of the structure and functioning of our ecosystems alongside the provision of food, fibre and other services. We must be able to describe ‘what good is’. ‘Good’ has to be responsive to our monitoring and modelling if effective measures are to achieve SMNR and well-being outcomes.

From Land Use and Soils Chapter
Adaptation of land management systems and practices. Work to maintain healthy soils to increase the ecosystem’s resilience to the effects of climate change.