



Soil Health in Agriculture

29/04/2025

Soil is an ecologically and economically valuable resource that sustains life and provides a range of ecosystem services to Wales.

This paper provides further evidence for the Economy, Trade & Rural Affairs Committee's scrutiny session on Soil Health in Agriculture.

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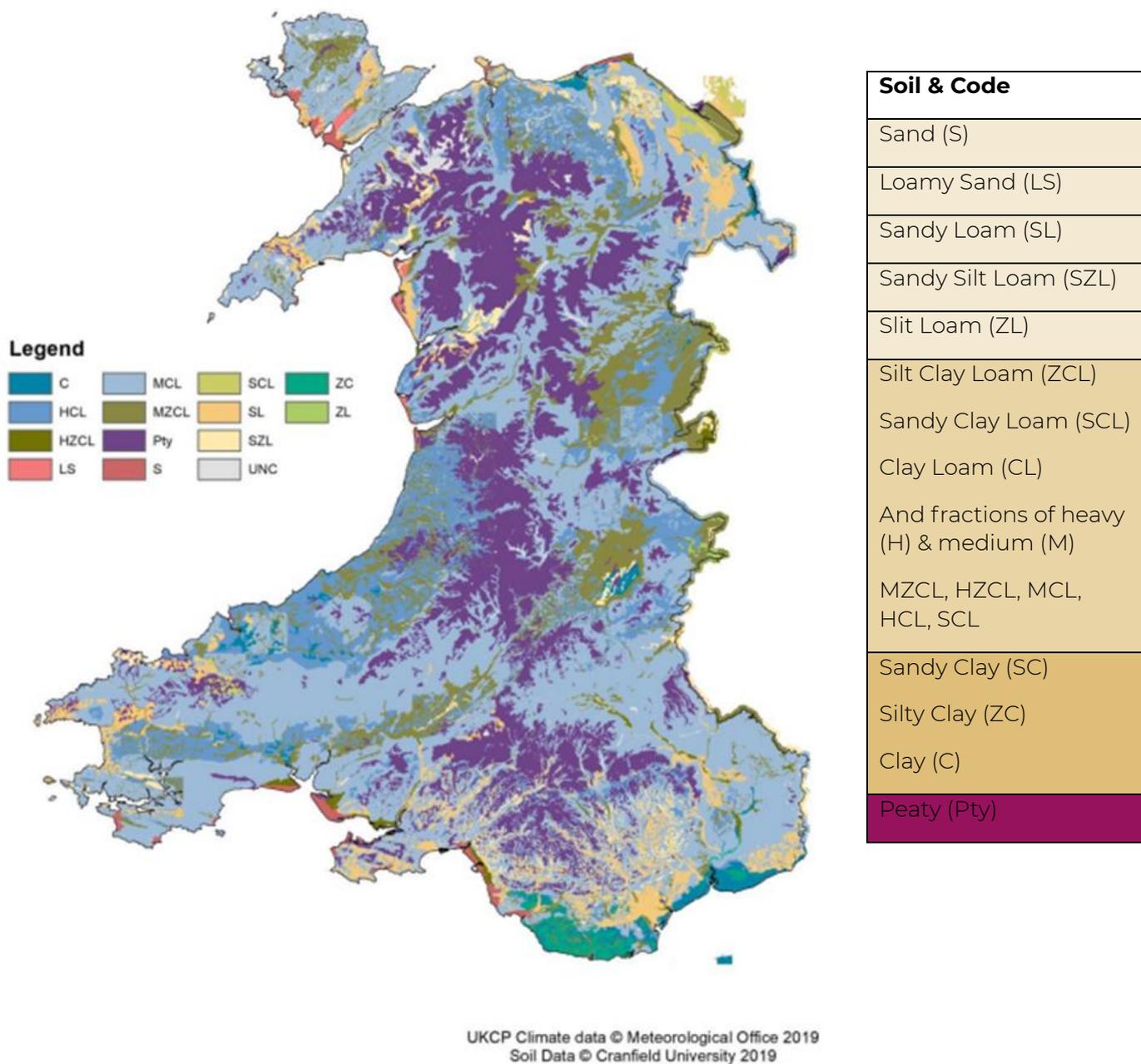
1. Introduction

The culture and environment of Wales is distinct, resulting from the soil and farming of the country, with grassland dominated systems and soils that are often wet and rich in organic matter. Due to slow formation processes, soil is considered a non-renewable resource and thus requires sustainable management. With over 80% of the land in Wales is under agriculture, land use and farming practice along with climate impacts are the main factors that influence the condition of soils in Wales.

There are 183 different soil series in Wales and their texture (Fig. 1) is made up of one or a combination of silt, sand, clay (mineral) and organic material. The role of soil texture is critical to all farming and soil management decisions. These can be generally described by four broad groups: 1) Mineral free-draining brown soils; Gley soils with impeded drainage and seasonally waterlogged; Organo-Mineral soils in cold and wet areas represented by a shallow (<30cm) peaty topsoil; and, organic peat soils having >30 cm depth of peat from the surface.

The variation in soil type, the climatic range it sits within (temperature, wind, rainfall) and site characteristics (gradient, flow-paths, bedrock, landscape) means the risk and associated degree of severity of impact from differing land use practices may be highly location specific.

Fig 1: Distribution of Topsoil Texture Classes:

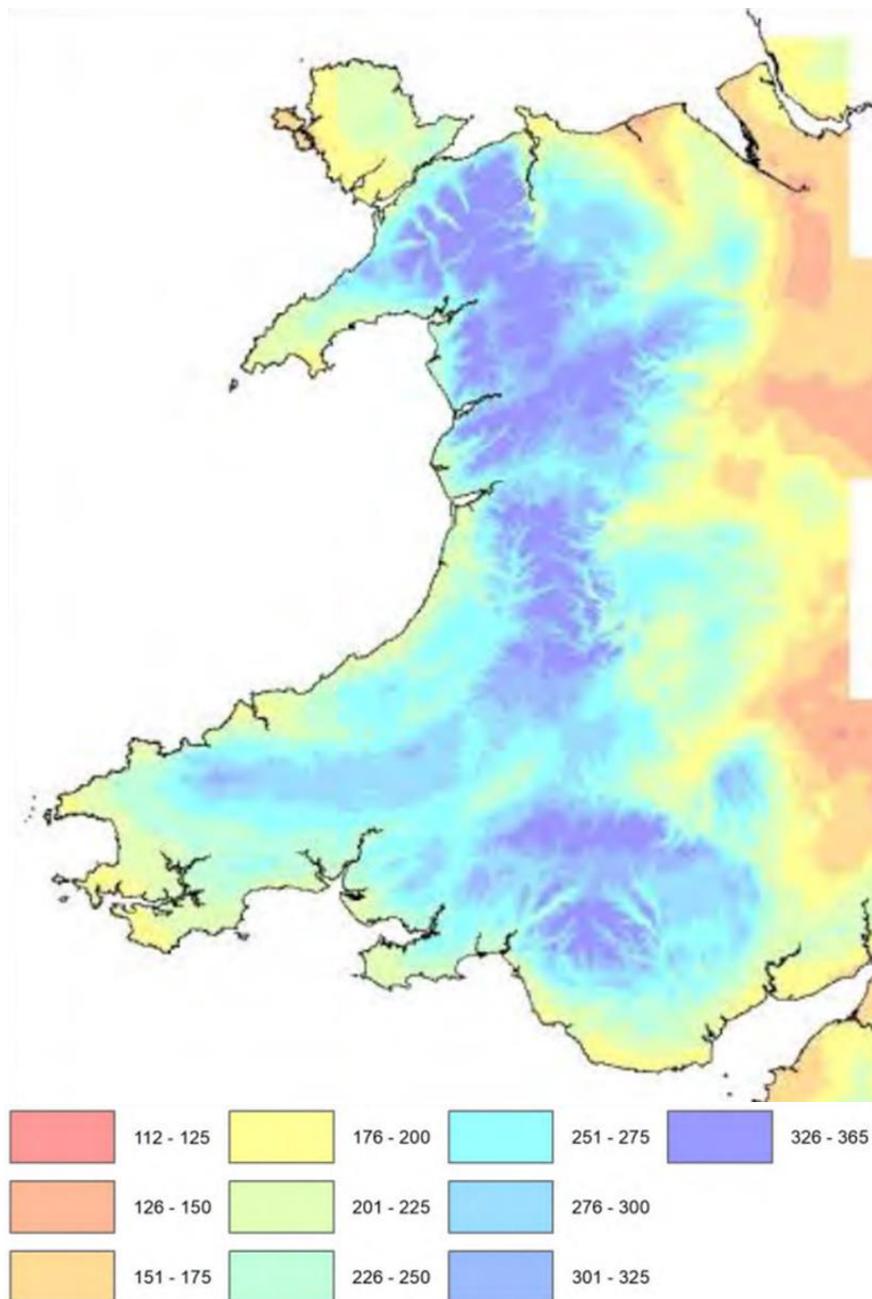


Land work and cropping opportunities are strongly limited in Wales by climate. Rainfall and temperature influence the planning of agricultural activities to ensure optimal soil conditions for both workability and trafficability. This is assessed through the number of Field Capacity Days (FCD) (Fig. 2) for any particular site (i.e. the number of consecutive days the soil is fully saturated).

Most Wales is at >200 FCD meaning the days to work and traffic soils are often <165 days per year. In comparison, some coastal and border areas are lower at 151-200 FCD, with many places in England at <151 FCD. Having fully saturated soil for most of the year, raises the risks associated with cultivation (erosion, compaction,

crop establishment, treatment and harvest) across large parts of Wales and is a significant reason why the majority of land use is grassland as opposed to arable.

Figure 2: Field Capacity Day Zones



A one size fits all approach cannot be applied across all soils, land use and climatic contexts. Soil protection and enhancement requires a degree of context specific interpretation whilst recognising the risks. The overarching Soil Policy Objectives are set out in the [Agricultural Soil Policy Statement \(ASPS\)](#). It seeks to provide a Wales specific framework to consider the development of interventions.

The Objectives are as follows:

Objective 1: Increase information on Welsh soils

Objective 2: Encourage sharing of information on soils

Objective 3: Protect, maintain and enhance soils, soil functions and services

These sub-objectives provide further information contained within the ASPS:

- i) Protect soils from erosion through appropriate management in areas at risk.
- ii) Maintain current stores of soil organic matter and increase where appropriate, through effective soil management.
- iii) Balance soils' nutrient cycling to ensure the effective delivery of soil functions and services.
- iv) Maintain and improve soil structure, with a focus on minimising soil compaction through appropriate management during high-risk wet conditions.
- v) Protect and foster soil biodiversity through appropriate management.

The Sustainable Farming Scheme, Farming Connect, the Planning Policy Framework, Climate Adaptation, ERAMMP, the Soil Policy Evidence Programme, SoNaRR, the Natural Resources Policy, the National Peatland Action Programme all play an important and distinct role in meeting the dynamic needs of protecting and enhancing Welsh soils.

2. The Role and State of Soils in Agricultural Systems:

Agricultural soils are an ecologically, economically, and socially valuable resource for Wales. They are considered a finite resource, due to slow formation rates. Agricultural soils provide several functions and services:

- — providing the basis for food, biomass derived energy, and raw materials like timber or other fibre crops
- — regulating environmental cycles of nutrients and carbon
- — providing valued habitats and sustaining biodiversity
- — regulating water flow and quality
- — regulating climate and mitigating some climate change impacts
- — preserving cultural and archaeological heritage such as in historic enclosures and traditional cultivation patterns.
- — providing a platform for infrastructure.

Most agricultural land (c.87%) is dominated by permanent and new grasslands and rough grazing land. The area under arable and horticultural cultivation is c.5-6% of the agricultural area. Large areas of managed grassland and wet climatic conditions (which generated large areas of peat and organo-mineral soil) have resulted in a greater carbon content than most soils in England and Europe.

In summary, agricultural soils in Wales are distinctive and are generally in good condition¹ due to the prevalence of soil protection afforded by grassland systems; however, there are highly localised soil issues.

Current threats include localised loss of soil organic matter, soil erosion, loss of soil structure and compaction and imbalanced soil nutrient cycles. Emerging threats are climate change and agricultural management change, which are interconnected and are expected to further increase pressures on soils. This is a priority area for further analysis of the long-term soil monitoring data.

¹ [Synthesis of Welsh Soil Evidence](#)

3. Monitoring of Soil Health

The Environment and Rural Affairs Monitoring and Modelling Programme (ERAMMP) is funded by the Welsh Government to provide scientific evidence and analysis to support the development of policies and evaluate programme implementation in agriculture and land use. The [ERAMMP National Field Survey](#) builds on past monitoring including repeating the baseline Glastir Monitoring and Evaluation Programme (GMEP) field survey to provide national trends in natural resources including soils and to assess the impact of the Glastir scheme.

The ERAMMP National Field Survey soil measurements include soil organic matter, soil organic carbon, moisture and bulk density, pH, total nitrogen, available phosphorus, mesofauna, eDNA for microbial and animal populations and hotspots for soil loss and erosion feature prevalence. All the measurements are co-located with land-use and vegetation.

Soil monitoring is a key component of ERAMMP and the [Wellbeing of Future Generations Indicator-13](#) recognises this through reporting the measurement of the quantity of soil carbon and organic matter content of topsoil (0-15cm).

Some soil health properties take many years to respond to management changes, whilst others change seasonally. Whilst [The Welsh Soil Evidence Review](#) concludes soils in Wales are generally in good condition, ERAMMP's long term monitoring allows Welsh Government to assess longer term changes and trends.

The prevalence of grassland systems helps protect soils and store carbon. However, the recent [Wales National Trends and Glastir Evaluation](#) highlights several areas for further investigation. These include the rates of soil disturbance and erosion; a general increase in the density of agricultural soils; and a decline in soil carbon for horticultural and arable soils. National reporting enables Welsh Government to commission further investigation into the reasons for the trends, to target monitoring and to develop policy responses.

Specific policy, evidence, reporting and operational projects may be accessed through [ERAMMP \(Evidence & Analysis Reports\)](#), [State of Natural Resources Reporting](#) (SoNaRR), and the [Soil Policy Evidence Programme](#) (SPEP).

Current Priorities:

The SoNaRR [Assessment of Mountains, Moorlands and Heaths](#) confirms our peatland soils and habitats are generally in a degraded state and hence the reason for a bespoke and dedicated [National Peatland Action Programme](#)

(NPAP) to restore these precious wetland habitats. NPAP provides national coordination for the monitoring and reporting of peatland restoration activities across Wales. NPAP publishes all restoration and habitat management activity on the [Wales Peatland Data Portal](#).

The Soil Policy Evidence Programme Bare Soil Risk Monitoring Pilot Study is a 12-month project into the use of satellite imagery to assess the risk bare soils pose to watercourses for all catchments in Wales. The monitoring system is due to begin in June 2025 and report findings at the end of 2026.

Agricultural Land Classification (ALC) System Full Technical Update: this is a joint Defra & Welsh Government project to fully update ALC system, including the underlying data and methodologies, to ensure that land quality data is accurate and comprehensive into the future. The Welsh Government has provided considerable technical input into this project building upon the Technical Review Series [Parts 1-5](#) and [Scoping Assessment](#) we produced on behalf of the two governments.

4. Classification of Soils for Land Use:

The Agricultural Land Classification (ALC) of England and Wales classifies agricultural land into six grades (1, 2, 3a, 3b, 4 and 5) according to the extent climatic, soil and site characteristics restrict agricultural use. The limitations may affect the range of crops, the yield and the associated cost of farming the land.

10-15% of Wales is classified as Best and Most Versatile Agricultural Land (BMVAL), defined by ALC grades 1, 2 and 3a. BMV land can grow a range of crops and is the most flexible, productive and efficient in response to inputs, making it the best land to deliver a variety of food and non-food goods and services.

The Welsh Government takes an active role in protecting BMV land through planning policy, making representations on planning applications, providing land classification evidence and maintaining land classification survey standards. Wales is unique in offering a free ALC survey validation² service to ensure all parties can rely on the technical information they are presented with.

Planning Policy Wales³ seeks to conserve BMV land as a finite resource for the future. Considerable weight should be given to protecting such land from development, because of its special importance. The scope and importance of the policy is further clarified in Dear Chief Planning Officer Letters⁴.

In 2017 Wales produced the [Predictive Agricultural Land Classification Map](#); the first substantive update in either England or Wales since the 1970s. It has been designed to assist Local Planning Authorities, Developers, Surveyors and Farmers make informed long-term decisions over the use of land in the planning system and to target survey work to the most appropriate locations.

In the paper 'The global standard bearers of soil governance'⁵ by Lewis R. Peake and Cairo Robb Welsh Soil Governance in this context is described as: "*With respect to soils, the "letter of the law" varies little across the four countries [of the UK], but the interpretation, enforcement and supporting infrastructure of Wales sets it apart from its neighbours... In Wales, however, the primacy of ALC and BMV land has been maintained*".

² [Agricultural land classification: predictive map guidance](#) (section 3)

³ [Planning Policy Wales - Edition 12](#) - Paragraphs 3.58 & 3.59.

⁴ [BMV agricultural land and solar PV arrays](#) & [Agricultural land classification reports](#)

⁵ [The global standard bearers of soil governance - ScienceDirect](#) 4.1.6. Wales (UK)

5. The Policy and Legislative Mechanisms to Protect Soils and Productive Land.

Agricultural Soil Policy Statement – Policy Landscape

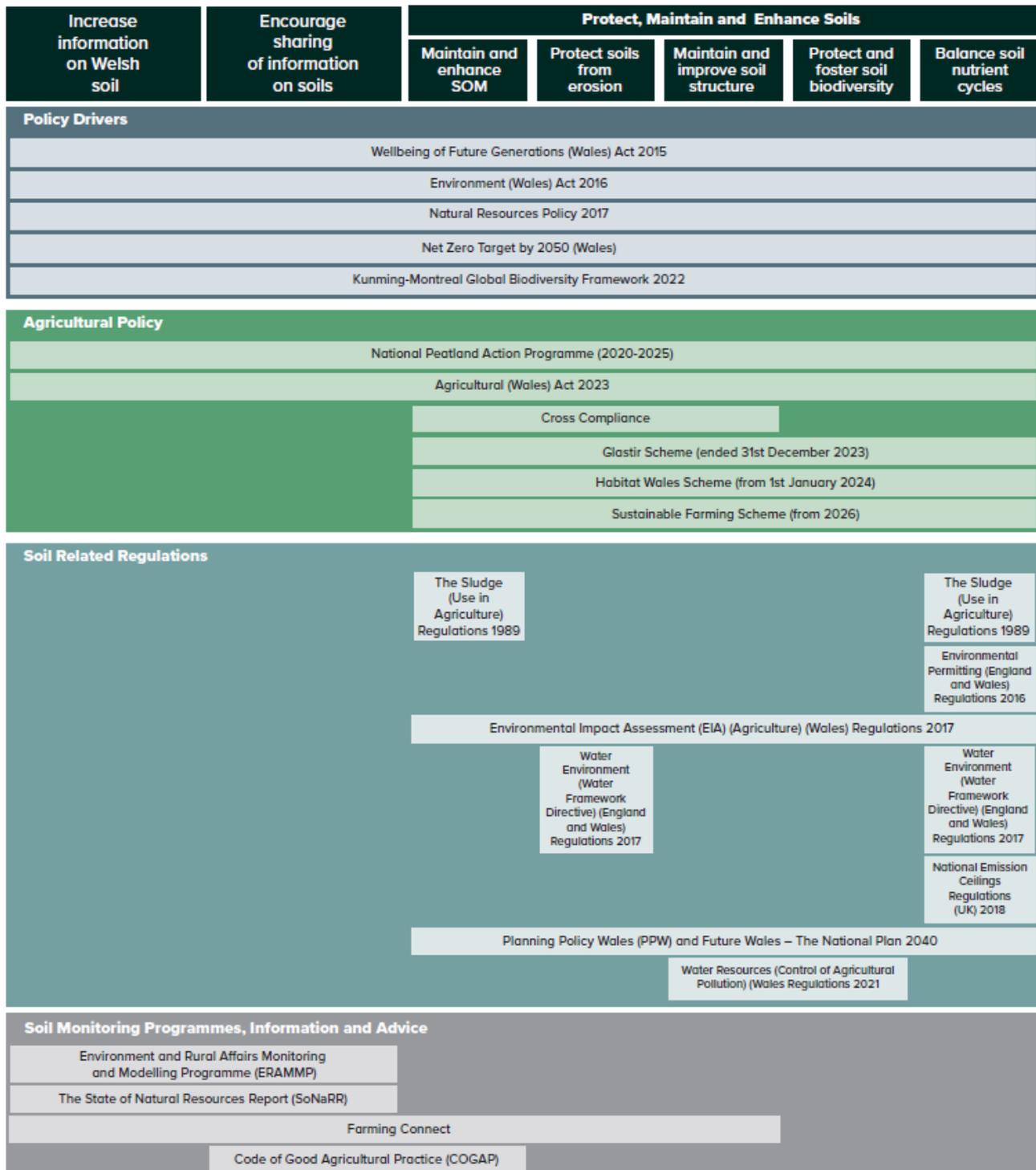


Fig. 2 An overview of the soil policy framework in Wales

Until the publication of the Agricultural Soil Policy Statement, there was no overarching soil policy for soil protection in Wales. There are policies relevant to soils in place, but they are spread across many policy areas and generally limited to specific functions or impacts of soils. This limits their combined effectiveness to protect soils. The Agricultural Soils Policy Statement seeks to provide a coherent vision and broad framework for sustainable soil management to address this gap. It does not set out new policy measures or contain detailed guidance for practitioners and it is not a regulatory document.

Specific Measures:

Planning Policy Wales (PPW) Edition 12 sets out the land use planning policies of the Welsh Government. It is supplemented by a series of Technical Advice Notes (TANs), Welsh Government Circulars, and policy clarification letters, which together with PPW provide the national planning policy framework for Wales. PPW, the TANs, Mineral-TANs and policy clarification letters comprise national planning policy.

Future Wales the National development Plan 2040 is our national development framework, setting the direction for development in Wales to 2040. It is a development plan with a strategy for addressing key national priorities through the planning system, including sustaining and developing a vibrant economy, achieving decarbonisation and climate-resilience, developing strong ecosystems and improving the health and well-being of our communities.

BMV land, soil and peat policies and context feature in all documents and cover general development management, national infrastructure and mineral planning policies.

Future Wales Relevant Paragraphs & Chapters:

- Chapter 2 – states that (BMVAL) Agriculture Our productive land is a vital resource. Agriculture has shaped our landscapes and supported our rural and market towns for generations. We must continue to value and protect our agricultural land and ensure it can feed and support us.
- Policy 9 on Resilient Ecological Networks and Green Infrastructure identifies BMVAL and carbon rich soil dependencies.
- Policy 18(11) Renewable and Low Carbon Energy Developments of National Significance - there are acceptable provisions relating to

the decommissioning of the development at the end of its lifetime, including the removal of infrastructure and effective restoration.

PPW Relevant Paragraphs & Chapters:

- 3.58- 3.59 The Best and Most Versatile Agricultural Land
- 5.14.29 – 5.14.30 Peat (mineral planning)
- 5.14.40 – 5.14.55 Soil (mineral Planning)
- Chapter 6: Desired Distinctive and Natural outcomes will be based on sustaining and creating places in which opportunities in all areas to improve the resilience of ecosystems are taken by addressing problems such as, building on floodplains, diffuse pollution, soil compaction and sealing, ensuring the protection of peat resources and improving approaches to coastal flood defence in urban areas and coastal margins.
- 6.4.15 – The Step-Wise Approach 1a and 1b relating to irreplaceable peat habitats and long undisturbed soils.
- 6.4.34 – Peat soil

Legislation, Technical Advice & Circulars:

- Dear Chief Planning Officer Letter: [Best and most versatile agricultural land and solar PV arrays | GOV.WALES](#)
- [Technical Advice Note 6](#) – Chapter 6 (BMVAL) and Annex B (Consultation arrangements with Welsh Government).
- [Mineral-Technical Advice Note 1](#) – Aggregates – Chapter D – Restoration and Aftercare – Soil Handling and Reuse.
- [Schedule 5 of the Town and Country Planning Act 1995](#) – beneficial after use – minerals.

Sustainable Farming Scheme: Soil is expected to feature directly and indirectly through the Universal, Optional and Collaborative layers of the Sustainable Farming Scheme, including a universal requirement for soil testing (minimum of 20% per year) supported by provision of advice through Farming Connect. This is intended to raise farmers awareness of the condition of their soil to support

positive management actions. Universal actions will also support soils by proxy through habitat management requirements and the preparation of designated site management plans. Further actions to improve soil health, prevent erosion and compaction, and safeguard carbon stocks will be supported directly through specific soil Optional Actions and indirectly through other Actions related to trees, water and habitats.

The SFS will include the Good Agriculture and Environmental Condition Requirements of the single farm payment system to protect soils from erosion and compaction (GAEC 4 and 5).

We continue to work with farmers and stakeholders, collaboratively to ensure soil health is recognised in SFS as a foundation of sustainable food production and in the role it plays in carbon storage and sequestration. The final Scheme Details are intended to be published this summer.

Farming Connect:

Funded by the Welsh Government through the Rural Investment Scheme (RIS), Farming Connect, a Knowledge Transfer Programme available across Wales, is a vital element of the support that Welsh Government provides to agricultural businesses.

Several interventions relevant to soils are available through Farming Connect including the Advisory Service which provides subsidised 1:1 bespoke, confidential advice from a FACTS⁶ qualified advisor – the intervention includes taking and analysing 15-20 soil samples plus a detailed nutrient management plan based on the results.

Farming Connect also provides support via one-to-many interventions including Discussion Groups looking at the importance of soil health and structure. Topics covered to date include the Principles of Soil Health; Principles of Plant Species Diversity; Role of Soil Biology & Livestock in Promoting Pasture Productivity; Management Techniques to promote water storage and carbon sequestration; and Multispecies Leys & Cover Crops. Masterclasses, workshops including a mixture of theory and practical learning for attendees, have focussed on soil health and encouraging soil analysis and topics covered included regenerative farming practices and grassland management.

The Farming Connect demonstration network of farms – Our Farms – have delivered 40 projects across 15 farms looking at how to improve soil health. All of

⁶ [FACTS Scheme](#)

the information gathered, and techniques used are disseminated to farmers from across Wales via open days, technical factsheets, podcasts and information videos.

An extension to the current service contract through to Spring 2026 will ensure continued provision and support the introduction of SFS in 2026. Work is ongoing to develop the future offer from Farming Connect.

The UK Forest Standards:

The UKFS provides additional information in Chapter 8 on forests and soil recognising their fundamental role in farmland ecosystems. As with agricultural soils, it recognises that soil is a vital but fragile resource that must be used in a sustainable way by knowing and working to soil type and condition.

The National Peatland Action Programme:

Peatlands support a variety of habitats and species, they capture and store carbon, regulate greenhouse gas emissions, maintain biodiversity, and regulate water flows and quality. Funded by Welsh Government, this programme was set up to stimulate, coordinate, and deliver peatland restoration action in Wales.

Peatland restoration action took place on over 3,000 hectares in the first four years (2020-24) meaning the programme surpassed its initial 5-year restoration target. Welsh Government actions for the peat policy area in the Climate Adaptation Strategy for Wales (2024) include increasing the annual rate of restoration to deliver 1,800ha of peatland restoration p.a. by 2030 and ultimately 45,000 ha of restoration by 2050.

6. The Potential for Legal Frameworks and Targets for Soils.

Looking to the future, ERAMMP national monitoring, SoNaRR, the Soil Policy Evidence Programme and joint research with Defra will all continue to help inform the Welsh Government approach to protecting soils and productive land. A changing climate will necessitate a flexible approach to address land use change, organic matter, nutrients, wetness and aridity.

Soil will be an important consideration in the development of the Sustainable Land Management indicator and targets framework. Indicators and targets are to be laid before the Senedd by end of this year. Indicators will be developed with stakeholders over the summer.

The Control of Agricultural Pollution Regulations review published on 31 March 2025 considered the role of soil and soil management for all agricultural land in Wales. It identified poor soil management as a significant risk to pollution to water. This is through soil run-off, a significant mechanism for nutrient losses and sedimentation, and the condition of the soil. Both factors have a significant impact on the ability of a crop to utilise the nutrients applied, therefore increasing the risk of pollution.

The review identified that there was a lack of legislative protection for soils in Wales, where they were a feature in other parts of the UK and recommended measures to reduce the risk of soil loss to the environment. The recommendations will be taken forward in full.

- Recommendation 6 (short term): Include requirements within the Control of Agricultural Pollution regulations to protect against soil loss to the environment, potentially replicating the Good Agricultural and Environmental Condition (GAEC) requirements of Cross Compliance.
- Recommendation 7 (medium term): Consider the role of higher risk cropping on potential losses of soil to the environment and effective mitigation techniques such as buffer strips.