

Arfon Williams

Sustaining the Gwent Levels

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Sustaining the Gwent Levels - *SGLSMS*

- A **Sustainable Management Scheme (SMS)** project funded by the Welsh Government's Rural Development Programme.
- It took place between 2018 and 2022. Advisory and delivery groups were made up of RSPB Cymru, Living Levels Landscape Partnership (LLLP), NRW, Gwent Wildlife Trust (GWT) and Farming Connect.
- **Worked closely with farmers** and other local partners to develop the understanding, knowledge, skills and experience needed to deliver the sustainable management of natural resources within the Gwent Levels.



In partnership with Living Levels.



Key areas the project focussed on:

- **Environmental** - poor water quality and the unfavourable condition of many of the Level's SSSIs:
 - Diffuse pollution from agriculture *and urban areas, and direct pollution from sewage and urban run-off.*
 - Almost all the Gwent Levels SSSIs ditches and reens are in unfavourable condition.
 - The Levels, like the rest of Wales and the UK, have suffered the loss of wildflower-rich grasslands leading to declines in pollinating insects.



- **Policy and legal frameworks** concerned with agriculture and the environment are changing as the Welsh Government develops its own priorities and ways of working, and responds to the changes resulting from the UK's withdrawal from the European Union.
Key concerns include addressing the **climate and biodiversity crises**, and developing appropriate policies to promote **sustainable food production**.

What did we set out to do?

The project set out to demonstrate farming that:

- Benefits nature, with a focus on SSSIs, pollinators, key bird species and traditional orchards;
- addresses natural resource issues, especially poor water quality; and
- secures environmental benefits for society as well as producing food.

The project also aimed to promoted sustainable farming by:

- raising partners' and stakeholders' awareness and understanding of sustainable farming and its benefits, including wider socio-economic opportunities;
- through demonstration contribute to the development of new farming policies and schemes;
- highlighting the benefits of cooperation through targeted action at the landscape scale; and
- enhancing relationships within and between communities, including rural, peri-urban and urban.

A further objective was to facilitate farmer engagement with new and developing policies, processes and mechanisms that have the potential to support sustainable farming.

The critical role of a local Project Officer

- The objectives were largely delivered through the employment of a **Project Officer**, Lewis Stallard, who coordinated the arrangements between the project partners, facilitated farmer engagement with the project, and engaged with local communities and stakeholder groups.
- He also managed the tendering processes for on-farm contract work and was responsible for gathering information for recording and reporting, as well as producing integrated guidance on the delivery of sustainable land management to inform and support future land management policies and delivery.



SSSI ditch and reen maintenance

- Maintenance of the drainage system is vital to keep the water level stable. NRW is responsible for the main reens, however c. **1200km of field ditches are the responsibility of individual landowners**. These should be cleared over a 10 to 30 year cycle.
- Lines of willows have historically been planted to help stabilise the Levels' ditch banks. These were maintained by pollarded every few years, which also stops the trees from shading of the reens and avoids too many leaves dropping in.
- **Local contractors** were engaged to undertake ditch maintenance work.



Orchards

- Traditionally found near most farms in the Levels, many orchards included locally specific apple (particularly cider apple) and pear varieties.
- As well as being part of the cultural landscape and providing fruit and drinks, orchards provide habitats for a variety of wildlife species.
- Trees and advice from members of the Living Levels team were offered to assist with, firstly, planting new or re-establishing former orchards, and, secondly, renovating and enhancing existing orchards.



Nest Boxes

- The Gwent Levels provides suitable feeding habitat for some declining bird species including Tree Sparrows, Kestrels, Barn Owls and Little Owls. However, there is a lack of nesting sites.
- While orchard maintenance and willow pollarding will eventually help to provide nesting habitats, nest boxes offer temporary assistance.
- **Goldcliff Ringing Group** provided and sited 259 such boxes, undertook monitoring of the boxes, and
- worked to raise awareness of these birds, through engagement with landowners and volunteers, articles, workshops and training.



Nutrient Management Plans

Nutrient Management Plans were offered through the **Farming Connect Advisory Service**. Assessments and advice were provided in two areas:

- An audit of **farm infrastructure** to assess the extent to which farms complied with current regulations. Plus recommendations for improvement or compliance where necessary.
- **Soil tested** for acidity / alkalinity (pH), phosphorous (P) and potassium (K) levels. Plus report covered the background to the farm, general soil health and a detailed analysis of the soil results with recommendations on how to improve soil condition.



Water Quality Assessments

- **Natural Resources Wales** undertook visits to both of the case study dairy farms as part of its wider **Dairy Project**.
- The purpose of the Dairy Project is to visit every dairy farm in Wales, providing pollution prevention advice on farmyard infrastructure, in order to reduce all sources of agricultural pollution and achieve compliance with the Silage, Slurry and Agricultural Fuel Oil Regulations (SSAFO 2010).
- Dairy Project visits involved a walk around the farmyards, assessing the infrastructure (slurry stores, yards, silage clamps, etc.) and providing on-site advice and guidance. Officers then calculated slurry production figures for each farm and produced a Dairy Project Report with recommendations if necessary.



Pollinator Surveys

- In order to protect and improve biodiversity in the Levels, farmers were offered a survey (by **Bumblebee Conservation Trust**) of the pollinators and suitable pollinator habitat on their land, along with advice on any improvements that could be made.
- At each holding, a broadly circular walk was undertaken, lasting 2-3 hours depending on the size of the farm. During the walk, areas of semi-natural habitat were identified along with any pollinators, the abundance of which was noted, and some of the more dominant plants recorded.
- The element project highlighted an increasing interest in **herbal leys** as a nature/farming solution.



Farm economic assessments

Economic reviews with **Nethergill Associates**, using their approach to farm economic analysis, based on the understanding:

- It is more economically advantageous to work within the natural system on farms than to make up shortfalls in feed and health with bought-in products.
- These additional inputs usually increase with increasing stocking levels, which put pressure on the land's natural capacity to beyond its Maximum Sustainable Output level.

Farm assessments involve detailed examination of the budgets of participating farms; thus, reports were only made available to the individual households concerned. However, the findings showed that farms have significant opportunities for profit improvement, usually by reducing stocking rates.



Participating farms:

Farms	Capital Works				Nutrient Management Plan	Water Quality Assessment	Pollinator Survey
	Ditches (km)	Pollards	Orchards (ha)	Nest boxes (no. farms)			
Sluice House	1.476	0	0		Y		Y
New	0.477	2	0.05		Y		Y
Fair Orchard	0.958	0	0		Y		Y
Arch	0.36	1	0	Y			Y
Cross	0	8	0.63	Y	Y	Y	Y
Great Newra	1.205	0	0.87	Y	Y		Y
Hazel	0	0	0		Y		Y
Whitson	0.375	5	0.66	Y	Y		
Great Porton	0.717	13	0	Y	Y		
Mead	0	8	0.38	Y	Y	Y	Y
Total	5.568	37	2.59	6	9	2	8

Payment for Ecosystem Services:

- The potential to pay farmers for providing wider benefits for society was explored.
 - **Resources for Change** conducted three workshops with local communities,
 - supplemented by a number of expert interviews conducted by **Cynidr Consulting**.
- A variety of PES scheme possibilities appear to present themselves:
 - **Carbon capture schemes** are currently receiving a great deal of attention and, more locally, **water quality and water level management** are important.
 - There are also possibilities for capitalising on the benefits provided by **good quality outdoor environments**
- Although **sustainable food production** is not always considered a PES activity, it perhaps offers the greatest scope for encouraging farming practices that are environmentally and financially sustainable.



Modelling environmental opportunities and risks

Environment Systems undertook modelling for a variety of Ecosystem Services and habitats. Seven key themes were explored:

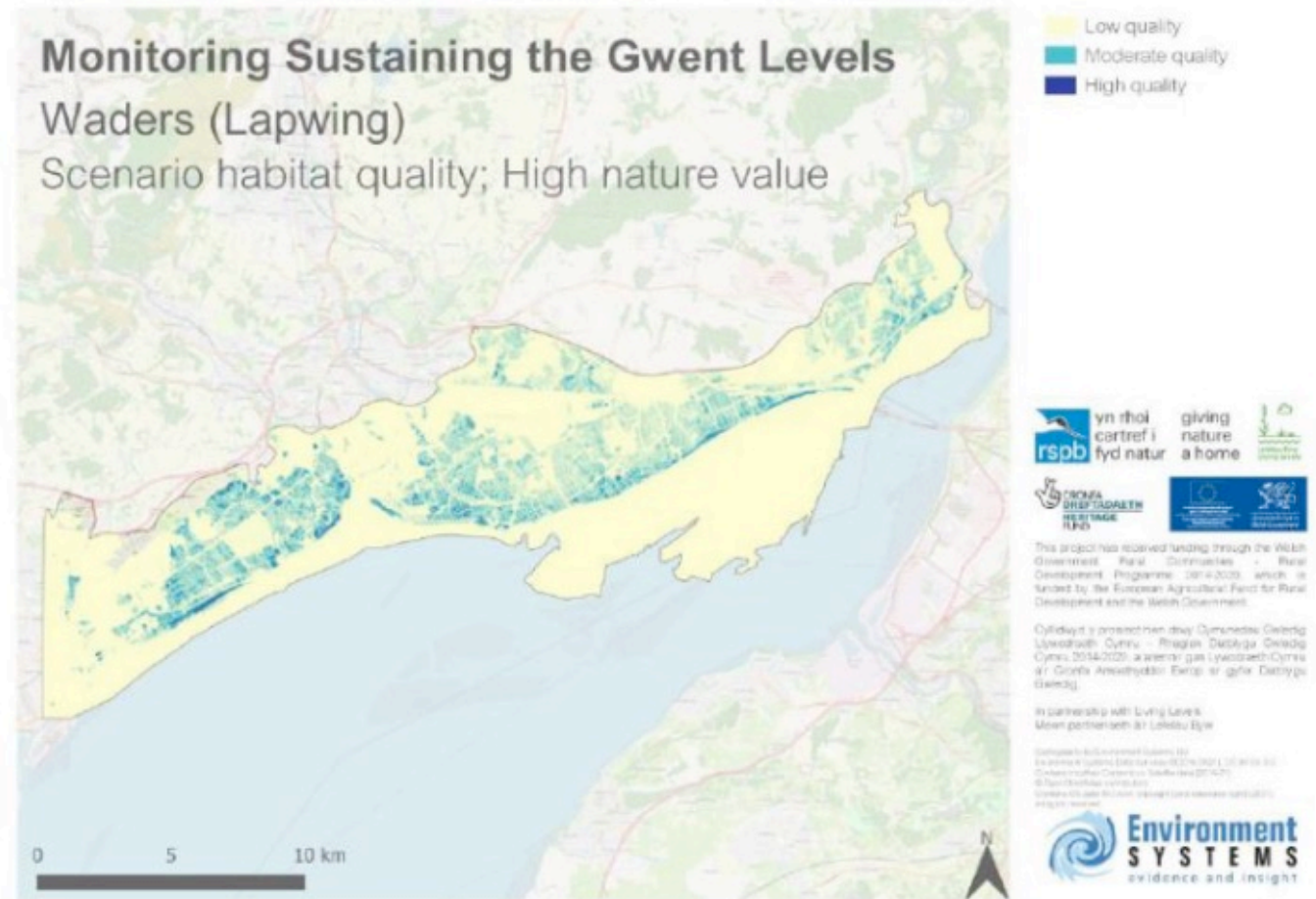
- wader habitats (represented by Lapwing);
- pollinator habitats (represented by Shrill Carder Bee);
- landscape connectivity (primarily represented by three species of bats);
- aquatic habitat (condition and connectivity of the ditches and reens);
- landscape structure (wooded features);
- water quality; and
- carbon storage.

For each theme, four models were produced that examined:

- theme quality;
- theme connectivity or risk;
- opportunity for expansion; and
- scenario modelling considering the effects of a) maintaining the status quo, b) the intensification of industrial and agricultural pressures and c) a move towards high nature value farming

Wader Habitats (Lapwing)

Scenario model – high nature value

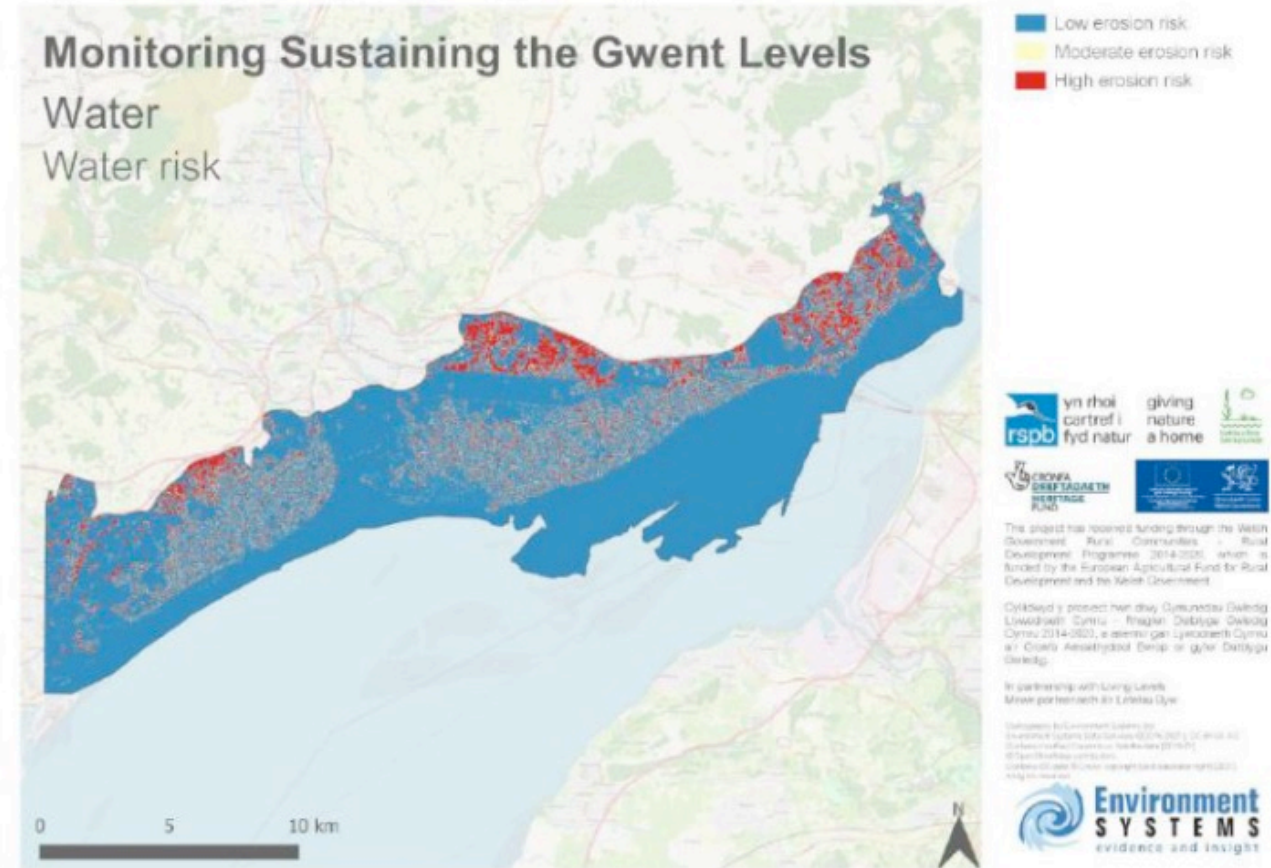


Water Quality

Theme risk

Loss of soil from the land to the water system during rainfall and storm events has the potential to affect which types of habitats the soil can support, as well as the quality and condition of those habitats.

From external pressures, soil disturbances resulting from agricultural practices can lead to increased erosion and nutrient leaching from soils, which can lead to eutrophication within inland aquatic and coastal ecosystems.





The company suggests that an **online mapping tool** could be developed that holds and visualises the data. They also recommend that:

- The accuracy of the habitat data could be enhanced by **additional manual interpretation**, focusing on features with possible inaccuracies, such as silage fields, or older data.
- Habitat data are **regularly updated**, rather than periodically re-mapped, which would be more expensive.
- **Ground survey data** are incorporated into future iterations. There is a potential role here for public engagement and **citizen science** projects.
- Other **data sources** should be as up to date as possible, and steps should be taken to guard against the loss of any particular data sources in the future.



Underdrainage

- **Rigare Ltd.** and **Reading Agricultural Consultants** looked at the impact of **underdrainage systems**:
- There is **little difference** with regard to withstanding **drought and flood risk**.
- As underdrainage results in the loss of field grips, **in-field plant communities may be affected**, with the loss of those depending on wetter areas.
- Any danger to buried archaeological remains is likely to occur **during underdrainage installation** rather than as a result of its use.
- However, the loss of field grips is likely to lead to the intensification of the field's use and the resultant **loss of topographical features**, including ridge and furrow.
- Indirect effects of installing underdrainage include the possibility of **increasing stocking density**, which may impact on nature and the wider environment.
- The **costs of underdrainage installation relative to likely returns are significant**. These costs may be more acceptable for more intensively grown crops and those likely to generate a high return, such as maize or cereals, but this must be balanced against the risk of environmental damage.
- **“Spot drainage”** of small areas in otherwise drained fields may be economic where they bring unproductive patches of land up to the workability of the rest of the field.

Wetland Landscape Restoration and Maintenance in the Gwent Levels – Costings

Reading Agricultural Consultants provided costs for: the restoration and sustainable management of surface drainage features (reens, ditches and grips); grasslands and margins that are pollinator-friendly; hedgerows; and orchards.

Operation	Outcome	Cost	Unit
De-silting ⁴	Clean out base of wet or dry ditch to original profile (excavator and ditching bucket)	£6.50	/m
	(five year rotation – alternate sides)	£1,300	/km/yr
	Clean out base of wet or dry ditch to original profile (boom mounted cleaner)(double pass) ⁵	£0.12	/m
	(five year rotation – alternate sides)	£24.00	/km/yr



The financial implications for three theoretical farms of varying sizes and types were then modelled.

Recommendations for future agri-environment schemes:

The authors highlighted the importance of agri-environment schemes in funding these kinds of activities, and their recommendations revolve around improving the offer of such schemes:

- When seeking to influence farmers' behaviour, options for change should include **comparisons of the profits** that are likely to arise, and **advice** should be provided.
- **Include currently ineligible ditches**, with the possibility of having ditches and their adjacent hedges as either a single combined or separate options; and taking account of the appropriateness of boundary features, as hedges are not always the best environmental option in the Levels.
- Use **length of boundary**, rather than field area, as the basis of payment. With many Levels' fields being long and thin, the areas that must be avoided during operations such as muck-spreading are proportionately higher, resulting in increased losses of production.
- It is also suggested that including **management practices**, such as timing machinery and livestock access to the land, in ditch-related environmental agreements would enhance ecological benefits.

Other recommendations:

- Make the scheme's activities **easily accessible** to potential participants.
- Consideration of the **financial and time costs** to the farmers is vital.
- **Local knowledge** to design and deliver the project has an important role.
- The importance of a credible, energetic **local project officer**, able to communicate appropriately and offer relevant assistance, cannot be overstated.
- Farms should be encouraged to work towards **Maximum Sustainable Output (MSO)** by minimising or eliminating their corrective variable costs (CVCs).
- Potential **markets** for any additional products resulting from the project should be investigated.

Given the highly connected nature of the Levels watercourses, it is recommended that an integrated vision of land management is developed, based on Sustaining the Gwent Levels and other projects, and including wide stakeholder agreement.

What did the project achieve?

- By the end of the project, **all the farm-based targets had been met or exceeded**, with additional actions, specifically trials of herbal leys, being agreed or undertaken. The proposed landscape-scale activities were also successfully completed, specifically:
 - an initial consideration of the opportunities offered by Payment for Ecosystem Services (PES);
 - a programme of environmental monitoring and modelling;
 - advice, guidance and best practise management booklet, and
 - an exploration of the effects of modern underdrainage systems, where drainage activities would lower the water table below its current level.
- The project created a **positive environment** in which the Living Levels Landscape Partnership, and farmers worked together to develop knowledge, skills and trust, so that challenges could be met collaboratively and adaptively during and beyond the lifetime of the initiative.

Sustaining the Gwent Levels SMS Reports and Resources:

- Clarke, R.M. (2021) Gwent Levels bird nest box project: Final report Goldcliffe Ringing Group: Goldcliff, Gwent.
- Graham, J. and Hammond, M. (2022) Investigating ditch biodiversity in the Gwent Levels: a survey of vegetation and aquatic macro-invertebrates at 5 sites within the Gwent Levels.
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- Pike, S. and Metcalf, K. (2021) Monitoring Sustaining the Gwent Levels for the Sustainable Management Scheme project [Maps] Environment Systems Ltd: Aberystwyth.
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- Reading Agricultural Consultants (2022) Sustaining the Gwent Levels. Underdrainage and farming: current state – future management Reading Agricultural Consultants: Woodcote, Reading.
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- Resources for Change Ltd. (2020) A resilient future for the Gwent Levels interim report Resources for Change Ltd: Llangattock, Powys.
- Ricketts Hein, J. (2021) PES and the Gwent Levels: Local opportunities for paying for Ecosystem Services Cynidr Consulting: Glasbury-on-Wye, Powys.
- Ricketts Hein, J. (2021) Sustaining the Gwent Levels: Farm case studies Cynidr Consulting: Glasbury-on-Wye, Powys.
- RSPB Cymru (2022) Level advice / Cyngor y gwastadeddau RSPB Cymru: Cardiff. 23
- Short, C. and Hobbs, S. (2020) Summary of farmer interviews for Sustaining the Gwent Levels project CCRI: Cheltenham.

The main reason the project succeeded:



“It’s great having advice & guidance from other people from other sectors. But it works both ways and for them to speak to us and get our perspective on what we want on the land.” Andrew Waters



“As farmers we don’t have an abundance of cash-flow so it was an opportunity to get involved in something which would benefit us farmers but also the water courses.” Andrew Prosser

Thank you. Diolch yn fawr.

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Cyllidwyd y prosiect hwn drwy Cymunedau Gwledig Llywodraeth Cymru - Rhaglen Datblygu Gwledig Cymru 2014-2020, a ariennir gan Lywodraeth Cymru a'r Gronfa Amaethyddol Ewrop ar gyfer Datblygu Gwledig.



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