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Restoring our Freshwaters: pollution from land management

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Introduction

In 2013 Wales Environment Link (WEL) published *Valuing our Freshwaters*, which identified actions to protect our freshwater environment. These actions are even more relevant today, as we call for the restoration of our freshwaters. WEL cares about the health of our freshwater ecosystems because they provide us with safe drinking water, habitats for our increasingly threatened species and opportunities for recreation and well-being. The health of our freshwaters also affects our coastal waters, with pollution impacting upon our bathing water quality and shellfish fisheries. Pollution of our freshwaters and coastal waters has large economic impacts affecting businesses and the public, as the costs of cleaning our water are passed on through our water bills. Pollution is increasingly affecting our freshwater biodiversity – from the invertebrates at the bottom of the food chain to iconic species such as the Atlantic salmon and freshwater pearl mussel.

The EU Water Framework Directive (WFD) is the main driver of improvements in water quality across Wales today. It aims to ensure "good status" by 2027, with interim dates for improvement in 2015 and 2021. The WFD does not apply to freshwater ponds, however, which are vitally important for biodiversity. The top reason for failure of water bodies in Wales is agricultural pollution, followed by abandoned mines and contaminated land, acidification and forestry. **WFD assessments indicate that 171 water bodies in Wales are failing due to agricultural pollution and 61 water bodies are failing due to acidification[1].**

What are the ongoing issues for our freshwaters?

Acidification

Woodland canopies, both broadleaf and conifer, intercept airborne pollutants such as sulphates and nitrates and this leads to increases in surface water acidity in catchments with high levels of woodland cover. There is evidence to show this impact is worse for conifer plantations as they are more effective at intercepting airborne pollutants.

The level of acidification is on a general downward trend, but is projected to remain substantially higher than a century ago. Acidification episodes are often short-term, in the form of a pulse released during or immediately after a storm event, and these pulses of acidity can outweigh the impact of gradual long term trends. Extensive drainage installation for the establishment of forestry plantations at high altitudes, especially where planted on peat, are a known past cause of acidification of freshwaters. Such drainage can cause on-going water quality issues.

[1] NRW - Diffuse Water Pollution in Wales Issues, solutions and engagement for action https://naturalresources.wales/media/4059/diffuse-water-pollution-in-wales.pdf

Nitrate and phosphate pollution from cattle slurry and poultry litter

In recent years there have been some serious point source pollution events affecting rivers in Wales, such as the slurry pollution incident on the River Teifi in December 2016 that killed 1000 fish. WEL believes that such incidents could become more prevalent in future if significant action is not taken. Post-Brexit, there could be further pressure on farmers to intensify production to make their business economically viable.

Cattle in stream

Cattle fenced out of stream (water recovering)

We recognise the costs involved in maintaining and upgrading, or increasing the capacity of storage facilities for slurry and silage, and ensuring the safe application of manure, but this is essential if such incidents are to be prevented. In recent years, we have seen an increase in planning applications for intensive poultry, pig and dairy farms, which have an increased waste output. 81% of ammonia emissions come from agriculture[2] and the current proliferation in the intensive poultry units are contributing to the continuing high levels of these emissions[3] as well as phosphate – both of which end up in our waterbodies along with nitrates. Most proposals for new units are just under the limit requiring detailed regulatory approval, with the result that the substantive combined impacts are not being assessed or mitigated.

Soil and slurry entering stream

Soil and silt

Soil erosion from arable farming directly causes additional sediment in streams and rivers. Increased water run-off from badly trampled pasture and unprotected, eroding stream banks also contribute. This loss of soil has a negative impact on the resilience of ecosystems, not only by polluting the freshwater environment, but in terms of soil availability for food production. According to a 2010-11 Defra study, the total quantified costs of soil degradation in England and Wales are estimated at between £0.9 bn and £1,2 bn per year.[4]

[2] http://naei.beis.gov.uk/overview/pollutants?pollutant_id=21
[3] https://uk-air.defra.gov.uk/assets/documents/reports/cat07/1710060932_DA_Air_Quality_Pollutant_Inventories_1990-2015_v01-01.pdf
[4] Defra (2010-11) SID5 Costs of Soil Degradation

Changes in recent decades such as increase in field size, loss of hedgerows and use of heavier machinery have increased the risk of soil erosion. Climate change and predicted increase in frequency of severe weather events is likely to magnify the impact of erosion (DEFRA, 2009).

In an assessment for the restoration plan for the lower Wye SSSI, high sediment loading was observed in the Lower Wye, particularly at the confluence with tributaries, such as the River Monnow at Monmouth. The report states that "This is likely to have been sourced from the adjacent agricultural land which has insufficient riparian buffer zone to trap sediment carried in hill slope runoff before it reaches the main channel. There were many locations along the Lower Wye where degraded riparian buffer zone was observed."[5]

Watercourses in forested areas also suffer from siltation when timber is harvested using clear-felling methods. Removing all the tree cover has a big impact in re-wetting soils, and the soil compaction and rutting associated with poorly managed timber harvesting can greatly reduce water infiltration and increase overland flow and sediment delivery to watercourses.[6] Forest roads and tracks can also contribute to this if they are not properly designed to ensure drainage does not enter forest streams and rivers.

Soil loss due to inappropriate ploughing

Pesticides

The use of pesticides in agriculture has been a hot topic of debate in recent years, with the EU planning to ban certain pesticides, in particular neonicotinoids, due to the harmful effects they have on pollinators. The impacts on our freshwater have received much less attention but are no less devastating. Buglife has produced a UK report[7] on the impacts of neonicotinoids on freshwaters across the UK, showing that over half of freshwaters surveyed exceeded chronic levels of toxicity. This affects freshwater invertebrates, fish and other freshwater species, and threatens the safety of our drinking water. Buglife's report identified a lack of monitoring for pesticide pollution, which needs to be addressed so policymakers have a clear picture of the likely impacts for Wales.

The application of pesticides such as Cypermethrin, and more recently neonicotinoids, in forestry, have taken their toll on freshwater invertebrates, reducing food availability for fish and contributing to what has recently been acknowledged as a massive reduction in insect species globally. In Wales, we understand that Cypermethrin is no longer used on the Welsh Government forest estate, but it is difficult to monitor pesticide use on privately owned and managed plantations. Whilst the use of neonicotinoids in forestry is low compared to agriculture and horticulture, their use in forestry has a particular impact in upper catchment streams.

[5] http://www.therrc.co.uk/sites/default/files/files/Designated_Rivers/wyedrafttechnicalreport.pdf page 73

[6] BIRKINSHAW, S.J., BATHURST, J.C., IROUMÉ, A. AND PALACIOS, H., 2011. The effect of forest cover on peak flow and sediment discharge – an integrated field and modelling study in central-southern Chile. Hydrological Processes, 25 (8), 1284-1297.

[7] Neonicotinoids Insecticides in British Freshwaters - 2016 Water Framework Directive Watch List Monitoring Results and Recommendations' (Shardlow 2017)

What needs to be done to restore our freshwaters?

1. Effective Planning and regulation

We need an effective planning and regulatory framework to ensure that we can implement improvement, and meet our legal WFD duty to ensure no deterioration of the freshwater environment. This should include:

- retention of the objectives of the Water Framework Directive, Nitrates Directive and other EU legislation affecting the freshwater environment in domestic law;
- NRW and Local Authorities pausing any granting of permissions (planning applications and permits) and NRW undertaking an assessment of in-combination effects on water and air quality (including compliance checks) for each catchment with Intensive Livestock Units (ILU);
- introduction of General Binding Rules or Basic Measures for land management, Water Protection Zones and/or new Nitrate Vulnerable Zones, replacing cross-compliance measures under the CAP, which must be complied with in order for land managers to receive public money;
- application of regulations to pre-1991 farm waste facilities to ensure pollution incidents do not occur due to failure of old facilities that are no longer fit for purpose;
- permanently banning Neonicotinoid pesticides and Cypermethrin from use in land management in Wales, and taking a precautionary approach to the introduction of new pesticides to ensure they do not harm our insects and pollute our waters;
- rigorous application of the UK Forestry Standard, with both the public forest estate and commercial foresters held to account via an independently audited scheme such as UKWAS;
- a mandatory requirement for new commercial plantings to design in the various recommendations made for the mitigation of acidification, including the need for continuous cover forests containing a more diverse range of species; and
- an NRW review of how the peat assessment tool is used in relation to restocking, to ensure planting on peat soils is not happening through misuse of this tool.

2. Strong enforcement

WEL believes that an effective enforcement system needs to:

- tackle breaches of statutory requirements more effectively: polluters should pay fines that are proportionate to the turnover of their business, and land managers in receipt of public funding should demonstrate that they are delivering above and beyond statutory requirements;
- swiftly act upon regulatory breaches in relation to slurry/manure/waste management using a suite of solutions, including
    - NRW taking a targeted, proactive approach to enforcement in the areas most affected by pollution, combining advice to land managers with a willingness to fine polluters heavily where required; and
    - expanding the use of new technologies such as Lidar and GIS, which allow monitoring to take place continuously and issues to be identified before they become incidents.
- comprehensively monitor the cumulative impact of multiple new intensive livestock and poultry units on water quality and biodiversity; and
- ensure local authorities undertake their obligations under TAN5 in relation to cumulative impacts on designated sites (planning guidance specifically on the appropriate siting of intensive units may be necessary).

3. A new sustainable land management scheme

Any new sustainable land management scheme for Wales should include priority actions for the freshwater environment including:

- riparian buffer strips and other green infrastructure, such as wetland buffers (Integrated Constructed Wetlands), designed alongside watercourses and other sensitive habitats to filter out chemicals, nitrates, phosphates, fine sediments and faecal pollutants;

- action to improve the abundance and quality of freshwater ponds;
- supporting land managers to effectively and appropriately tackle INNS alongside watercourses (this may require provision of expert advice to ensure it is managed correctly);
- the avoidance of bare earth in arable agriculture through the adoption of undersowing with appropriate cover crops, or minimum or zero tillage
- a stronger approach aimed at eliminating nitrate and phosphate pollution through regulation (for example, to prohibit the practice of field storage and spreading of poultry litter) and advice;
- sustainable accreditation for farmers to include training on how to create and implement an effective Farm Nutrient Management Plan that works on the basis of low-input systems;
- investigation of new solutions to slurry storage and waste management, such as the Gelli Aur project to investigate ways of de-watering and purifying slurry in order to reduce the volume of waste that needs to be stored;
- where catchments are acidified due to pollution from agriculture, forestry or mines, in addition to catchment restoration work, mitigation measures such as liming should continue to be undertaken following assessment of their ongoing suitability for the local environment; and
- the restoration of afforested peat sites to improve ecosystem resilience and secure the wider benefits peatland restoration provides.

Wales Environment Link (WEL) is a network of environmental, countryside and heritage Non-Governmental Organisations in Wales, most of whom have an all-Wales remit. WEL is a respected intermediary body between the government and the environmental NGO sector in Wales. Our vision is a healthy, sustainably managed environment and countryside with safeguarded heritage in which the people of Wales and future generations can prosper.

This position statement represents the consensus view of a group of WEL members working in this specialist area. Members may also produce information individually in order to raise more detailed issues that are important to their particular organisation.