

Delivery of the Teifi Demonstrator Catchment project

This paper outlines the proposal for a demonstrator catchment project within the Teifi, an approach agreed in principle between the NRW Chair and our Minister. We propose the project will equally involve partners, land and water management sectors and others, to showcase collaborative approaches to water quality and water resource improvements and building riverine habitat resilience through sustainable land and water management.

This paper provides an overview of a range of potential interventions across land and freshwater environments including partnership, regulation, voluntary actions in place to support people and nature thriving together. Within this project we will adopt agile approaches and *the* learning developed *will* be scaled up and out across Wales bringing multiple benefits to other river systems.

The Afon Teifi catchment has been selected because it offers a diverse landscape with varied river waterbodies. Agriculture and forestry account for the majority of land usage and there is a legacy of historic metal mining. Due to its important biological features the Afon Teifi and ten of its tributaries are a SAC and SSSI. Dairy farming predominates in the lower catchment with the uplands favouring sheep farming and forestry. The Teifi starts in Ceredigion, while downstream it forms the border between Ceredigion and the counties of Carmarthenshire and Pembrokeshire with tributaries within these areas. The Teifi also flows through the Cors Caron SAC and National Nature Reserve and out into the Cardigan Bay SAC.

Currently the Teifi SAC catchment is failing with discharges from Water Company assets a significant contributor to poor water quality. Other significant issues include acidification, historic metal mine pollution, diffuse pollution from agriculture and forestry activities, physical modifications and invasive non-native species. The Teifi supports an important salmon and sea trout fishery which is under multiple pressures including water pollution from land run off. There are strategically important public drinking water abstractions at Strata Florida and Llechryd. Recent research has shown that salmonid fish stocks are in very rapid decline with modelling predicting extinction of this species within the next 10 years.

We feel that we have a great opportunity to act now to work with land management and water sector partners and communities to reverse the trends we are seeing and to improve water quality, ecology and habitat, and support the resilience of local communities and the benefits that come from their natural environment.

We are aware of the large size of the catchment and the difficulty in measuring progress over such a large scale, so will be careful to build evidence and baseline assessments into the planning and be clear about the outputs we're aiming to achieve at the outset. We will also work to ensure that this work complements and draws together other work happening within the catchment, by NRW and by other partners.

Reasons for catchment selection:

- DCWW have been shown, through SAGIS modelling, to be making the biggest contribution to phosphate levels in the Teifi when compared to other sectors, with rural land use the next biggest contributor.
- The Teifi is an opportunity catchment for Water Framework Directive Regulations, as signed off by the Minister, and is therefore a priority catchment for NRW and Welsh Government

- Salmon are shown to be in faster decline in this catchment than in other areas of Wales. Other SAC species are in decline too.
- We have good partnerships already in place through the emerging Nutrient Management Boards, 4 Rivers for LIFE project and a strategic partnership with the local rivers trust.
- There are no significant NRW managed capital projects in the catchment at present offering a great opportunity to work collectively to understand what could be delivered either by us or others.
- There is potential for this to make cross-sector connections building on ongoing partnership work in the catchment including work emerging from the Nutrient Management Board (NMB), to deliver much more at scale.
- DCWW included a preferred option in its draft WRMP to increase abstraction at Llechryd to maintain security of supply in Mid & South Ceredigion resource zone, therefore there are opportunities to consider nature-based solutions/other measures that support water resources.
- The presence of a designated bathing water at the estuary

Potential projects and the need for collaboration

The intention of this proposal is to explore new and novel ways of working, and ways of developing environmental solutions that haven't been delivered before, by working together with other organisations both public and private, communities and third sector organisations.

Ongoing activities – DWR Cymru and LAs

Some of these projects may be partially delivered through existing work programmes and projects, but we want to emphasise here that this project would build synergies to deliver more, and would enable us to do things differently by using new approaches, working intensively in one catchment in a cohesive way to co-deliver with partners

Suggestions include but are not limited to:

- Through application of full nutrient assessment and planning of applications on the basis of both soil and crop requirement across crop rotations, assess the impact of utilising the catchment for the application of biosolids and materials to land in the future. This study should consider projecting future increases in P contained in biosolids from P stripping at WWTWs. This study should be used to assess, inform and extrapolate suitability of application in other sensitive catchments. This would be a different approach and would involve several partners to assess biosolids and sludge and its impact on land, as well as how any impact could be reduced.
- Survey and mapping of river habitat quality for the whole catchment; potential to use citizen science approaches for this. This could be used to direct restoration approaches. This would be delivered to a smaller extent through projects like Four Rivers 4 LIFE, but not currently a planned piece of work. Doing this would be a huge benefit to all partners, enabling a better understanding of habitats and how we could work together to improve.
- Riparian buffer strips with deciduous tree planting, aimed at shading river water (to reduce impacts of climate change), intercepting run-off from surrounding land, improving habitat connectivity, capturing carbon and improving the ecology of the area. Buffer creation and tree planting to be supported by a GIS modelling exercise to identify priority areas, based on current tree cover, river width and stream order, adjacent land use, solar aspect.

- Re-connection of river to floodplain where possible, to allow natural deposition of sediment and nutrients. Covered to some extent in Natural Flood Management projects, but only on a small scale. More funding would enable us to deliver much more of these kinds of project.
- Understanding the role of land management in regulating the soil capacity to store and filter nutrients, water and carbon.
- Implement planned smolt migration protection measures to address predation risk.
- Natural flood management / leaky dam structures within watercourses in a sub catchment, aimed at improving ecology and water quality, and slowing the flow of the river. Again, informed by GIS opportunities and constraints mapping and guidance on best practice.
- In-river habitat augmentation for key SAC species and habitats, such as the re-introduction of previously dredged gravel or boulders and introduction of large wood. As above, this is happening, but on a small scale.
- Delivering novel nature-based solutions for improving water quality and climate resilience. Some NBS is planned, but we could be more ambitious here and try out different approaches, alongside partners, effectively conducting research to see what solutions work best in different scenarios. There may be opportunities to work with the local authorities on exemplar projects on land within their control eg tenanted farms / smallholdings.
- River restoration initiatives in the WGWE, including (inter alia) accelerated deciduous buffer strip creation and culvert removal.
- Improving our data and evidence, for example via provision of a network of data sondes, or other means of capturing live water quality and ecology data, to better target sources of pollution and undertake proactive prevention and reactive enforcement. We need to do more to respond to questions we and society have around water quality and our catchments. This would involve working with partners to develop new approaches, new technology and new ways of sharing data to be more efficient and enable us to understand our catchments better.
- Investment in innovative approaches to data collection and / or treatment options to improve river quality, through linking up with academia and industry as well as Nutrient Management Board partners. As above, we could work with partners to develop new approaches, new technology and new ways of sharing data to be more efficient and enable us to understand our catchments better.
- Consideration of a targeted compliance inspection programme within the catchment across all regulatory regimes covering the recovery of organic materials to land for soil or crop need. For example, Farming Connect, could be a partner to undertake targeted visits within the catchment to advise farmers and support the better water quality outcomes we're aiming to achieve.
- Catchment wide community engagement / communications to highlight climate and species extinction risk and actions we can all take. Planned to a very small extent in current work programmes, but through a concerted effort and a multi-organisational approach we would be able to deliver much more, and better support communities too.
- Experimental regulation. For example, seasonal permits to allow for drier summers and wetter winters. We could explore a different approach to regulating experimental treatment options. Additional funding would enable us to make better assessments, using this catchment as a pilot, to better equip us for future challenges.

Proposed work programme

NRW has recruited a Programme Manager (Jon Goldsworthy) and Evidence Analyst to support the phase 1 work. We have had initial discussions with the LAs to use their assets and with DCWW regarding a monitoring programme and stakeholder working group for the Teifi.

Phase 1 – Project development and outline business case, stakeholder consultation, evidence evaluation 0- 6 months

Objective

Develop project design with partners with clear objectives, priorities and contributions to improve water quality in the Teifi.

Activities

- Determine suite of current interventions across the Teifi and their intended outcomes e.g. Four Rivers 4 LIFE, assess what they will achieve and what the opportunities to do more / do different are
- Liaise with stakeholders e.g., councils, water companies, farming unions, nutrient management boards, community groups, third sector organisations, to determine their contribution and what co-delivery of work might look like in the future.
- Ensure appropriate monitoring and evaluation to develop policy for change and adaptive approach to management of interventions
- Develop and share outline business case and business plan to deliver scoped project (Phase 2)
- Explore funding for next phase including use of Nature and Climate Emergency Programme and OFWAT funding opportunities, potentially Shared Prosperity Funding, academic and blended green finance.

We would then work with partners to assess the outcomes of Phase 1, and design Phase 2.

Phase 2 - Project delivery, evaluation and delivery of evidence for catchment approach to improving water quality 7- 60 months

Objective

Implement project design with partners with clear objectives and priorities to improve water quality in the Teifi.

Activities - dependent on the outcomes of Phase 1

- Oversight, evaluation and management of series of agreed interventions
- On the ground delivery of interventions
- Development of regulatory tools
- Suite of approaches for scaling up across Wales and scaling out to different issues i.e. beyond water quality.