source to tap

Interreg
EUROPEAN UNION
Northern Ireland - Ireland - Scotland

A Watershed Moment in Drinking Water Protection

24th May 2022
Lough Erne Resort

CLOSING CONFERENCE

Department of Agriculture, Environment and Rural Affairs
www.daera-ni.gov.uk

An Roinn Tithíochta, Rialtais Áitiúil agus Oidhreachta
Department of Housing, Local Government and Heritage

The Source to Tap project is supported by the European Union's INTERREG VA Programme, managed by the Special EU Programmes Body (SEUPB).

A warm welcome from Diane Foster, Source to Tap Project Manager

On behalf of our project partners, I'd like to extend a very warm welcome to our closing conference for the Source to Tap Project.

This €4.9m project is funded under the INTERREG VA Environment Programme with match funding from the Department for Agriculture, Environment & Rural Affairs (DAERA) in Northern Ireland and the Department of Housing, Local Government and Heritage (DHLGH) in Ireland and managed by the Special EU Programmes Body (SEUPB). The project started in January 2017 and will finish at the end of September 2022.

We have been very fortunate on the Source to Tap to have an excellent partnership to deliver our project. You can find out more about the partners in this booklet.

Northern Ireland Water and Irish Water often have issues with water quality abstracted from rivers and lakes. Land management practices can cause high concentrations of the herbicide methyl-4-chlorophenoxyacetic acid (MCPA) in drinking water source catchments, and loss of soil and organic material causes variations in colour and turbidity in the raw water abstracted from our rivers and lakes, creating challenges during water treatment. By improving raw water quality, it can lead to less intensive water treatment, use of fewer cleansing chemicals and reduced sludge production. This reduces water treatment costs and energy usage, whilst also contributing to improved biodiversity and climate change mitigation.

The project has piloted a range of sustainable cost-effective measures to reduce pollution and contribute to improvements in cross border raw water quality in the River Erne and River Derg catchment areas which provide water that serves parts of counties Fermanagh, Tyrone, Donegal, Cavan, Leitrim, and Longford.

We believe we are at a watershed moment in catchment management. Join us, as we share our journey with you.

Enjoy the conference!

Conference Agenda

Time	Session	Talks
09:15 - 10.00 Registration		
10:00 – 10:50	**Session 1 - Welcome and Opening Addresses**	Address by NI Water Address by DAERA Address by DHLGH Address by SEUPB Address by Irish Water Welcome from our host - Ella McSweeney
10:50 – 11:00	**Session 2 - Integrated catchment management from Source to Tap**	10:50-11:00 Overview of the StT Project – key headlines and outcomes
11:00 – 11:20 Break		
11:20 – 12:10	**Session 3 – Farming for Water: The science and cost-benefit behind catchment-scale success**	11:20-11:35 Farming for Water - Delivering a cross-border Land Incentive Scheme (LIS) 11:35-11:45 Evidence of impact of LIS 11.45-11.55 Cost Benefit outcomes 11:55-12:10 Panel Discussion with live Q&A
12:10 – 12:20 Break		
12:20 – 13:00	**Session 4 – The talk of the catchment**	12:20-13:00 An interactive discussion with members of the community from the River Derg catchment about their experiences and learning from the project.
13:00 – 14:00 Lunch		
14:00 – 14:35	**Session 5 – Peatlands and Forestry for Water**	14:00-14:10 Restoration of peat to protect source drinking water 14:10-14:20 'Best practice plus' forestry measures to reduce sediment loss to source drinking water areas 14:20-14:35 Panel Discussion with live Q&A
14:35 – 14:50 Break		
14:50 – 15:20	**Session 6 – The legacy of Source to tap**	14:50-15:20 An interactive discussion with members of the StT Project team about their experiences and learning from the project and its legacy.
15:20 – 15:30 Closing Remarks		

Our presenter for the Source to Tap closing conference is award-winning food and farming journalist Ella McSweeney.

Ella was named Young Science Journalist of the Year, while her work on Mind Matters earned her a national Phonographic Performance Ireland Radio Award.

She has won two national Agricultural Journalism Awards for radio and print journalism and was awarded the International Federation of Agricultural Journalist star prize for broadcasting. She has produced and presented radio and television programs for both RTE and BBC and has written for the Guardian, Irish Times, Irish Examiner, and other publications.

Since 2008, Ella has presented RTÉ's award-winning food and farming series Ear to the Ground.

The Project Partners

NI Water is a Government Owned Company, set up to provide the water and sewerage services in Northern Ireland. We supply around 840,000 customers with approximately 560 million litres of good quality drinking water every day.

As the Lead Partner we have provided project and financial management on the project through a Project Manager and a Finance Manager and support staff across the organisation.

Irish Water is the national water utility in Ireland with responsibility for all public water and wastewater services, including maintenance and management of the water networks and the delivery of water and wastewater capital investment programmes.

As a project partner we have supported the delivery of the pilot Land Incentive Scheme, Learning for Water and Love your Water work packages through a dedicated Project Officer.

AFBI is the main scientific advisor to government in Northern Ireland carrying out high level technology research and development, statutory, analytical & diagnostic testing and consultancy work for Government and commercial companies globally.

As a project partner we led on the delivery of the monitoring and analysis of the impact of the pilot Land Incentive Scheme (LIS) and the cost benefit analysis of the LIS and community engagement aspects of the project.

East Border Region is a Local Authority-led cross-border network that promotes innovative, cross-border economic development in agriculture, industry, commerce and tourism, to improve the living conditions and employment prospects of those living in the region.

As a project partner we have provided support on the financial and non-financial management aspects of the project.

The Rivers Trust is an environmental NGO and the umbrella body for the rivers trust movement in England, Wales, Northern Ireland and Ireland. We work locally, with rivers trusts, to restore and protect rivers for the benefit of the community and environment.

As a project partner we have led on the implementation of the pilot Land Incentive Scheme, the Learning for Water and Love your Water work packages of the project, through two dedicated project officers and support staff from across the organisation.

Ulster University has an international reputation for excellence and innovation, making a major contribution to Northern Ireland's economic, social, and cultural development through teaching & learning, widening access to education, research & innovation and technology & knowledge transfer.

As a project partner we have led on the monitoring of the peat and forestry pilot projects and provided expertise and analysis on the water quality monitoring elements of the pilot Land Incentive Scheme.

Key Messages

For every £1 invested through the Source to Tap Project there will be £3.36 worth of benefits* through reduced water treatment costs and improved catchment ecosystem services.

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love your water

We have trained 43 volunteers in the Erne and Derg catchment to become citizen scientists, providing them with new skills and new equipment. As skilled guardians, these volunteers will play a vital role in protecting these rivers after the project ends.

- **Empowering communities** with knowledge, skills and equipment enable the public to play an active and meaningful role as environmental citizen scientists.
- **Engagement** must be sustained and built upon to ensure long term success which will deliver substantial water treatment cost savings and multiple additional benefits.

source to tap
learning for water

We have helped educate 1947 children on where their water comes from and the importance of good, clean, safe drinking water; ensuring that they help to protect the water we all rely on to thrive.

- **Primary age children are influencers** and should learn where their drinking water comes from and its journey from source to tap.
- **There is a desire to teach children about local environmental issues** and providing teachers with a structured, concise, and engaging education program that empowers them to teach this subject to their pupils.

source to tap
forests for water

We have opened a dialogue on the management of catchments for all ecosystem services. Forestry ecosystems are an important feature in Irish landscapes and provide numerous benefits to wider society. We have provided evidence of the benefits of enhanced measures to protect water quality from the negative effects of forestry activities.

- **Further reduction of forest-felling sediment loss** can be achieved by combining 'Leaky Dams' with current best-practice Check-Dams and this 'Best Practice Plus' approach should be employed to support all ecosystem services.
- **Low cost, readily available materials** can be used to create sediment reduction measures following harvesting operations, benefitting ecosystem services.

*Estimates of the benefits and costs of the pilot Land Incentive Scheme projected over a 30-year period, gives a Benefit Cost Ratio of 3.36.

We have helped 118 farming families make their farm business', water friendly. We have provided them with practical measures on their farms to make land management more sustainable and help protect water quality.

source to tap farming for water

- **Dedicated, non-regulatory farm advisors,** that form a long-term relationship with the farm business are best placed to provide agri-environmental advice and support to landowners in water friendly business planning on the farm.
- **Agricultural water protection measures must be attractive to landowners** and agri-environmental schemes must be easy to access, with minimal administrative burden on landowners, to achieve maximum uptake. Ongoing support to landowners throughout implementation is key to success.
- **MCPA reductions in river water were achieved** of up to 24% in herbicide concentrations, and 40% in loads, where weed wiping was substituted across less than 3% of the catchment area.
- **Decreasing trends in turbidity** were detected in the River Derg and can be attributed to measures such as livestock exclusion fencing helping to prevent erosion.
- **Ground-breaking new insights into MCPA herbicide dynamics in river systems were achieved,** revealing that over 70% of annual losses occur during short-lived storm events and that MCPA persists in the system year-round.

We have trialled an innovative cell bunding technique that others can use to help restore degraded peatland. Over time restored peatland will capture carbon, improve water quality, support biodiversity and contribute to the climate change solution in Northern Ireland.

source to tap peatlands for water

- **Cell bunding has been shown to work as a viable peat restoration technique** for formerly afforested peatlands on flat terrain with deep peat.
- **Biodiversity, water quality and carbon storage benefits** are beginning to be realised through cell bunding and wave damming at the Tullychurry Forest peatland restoration site, but further, long-term, monitoring is required to understand the recovery of the site over time.

CASE STUDY

Pilot Land Incentive Scheme

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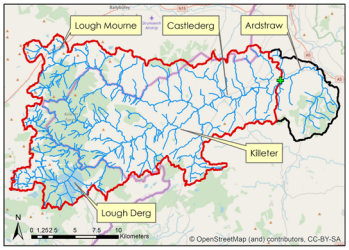
Aim: To design, pilot and monitor a cross-border land incentive scheme, that provides decision making support and grant aid to landowners to make changes in agricultural practice that benefit the river, its wildlife, and the farm business.

Location: The River Derg catchment, upstream of the Northern Ireland Water Treatment Works, located between Castlederg and Ardstraw, County Tyrone.



Key
- Land Incentive Scheme Eligible Area
- River Derg Catchment Boundary
- River Derg
- Derg Water Treatment Works

Grants for changes to farming practice

- €1.16 million was made available in grants
- 100% funding offered to each farm business (up to £20,000/€23,000 per farm)
- A range of options were offered to reduce MCPA, turbidity and colour impacts in nearby rivers.
- Support & advice every step of the way
- Each farm was offered a free, bespoke, confidential Water Environment Management Plan (WEMP) highlighting changes to help protect water quality as well as benefit the farm business.

Advice and Support	
1.1	**REQUIRED:** Water Environment Management Plan Development and Delivery *(produced by your project officer with your input)*
1.2	Rush and/or Peatland Management Plan *(where applicable)*
Herbicide/Pesticide Control and Rush Management	
2.1	Installation of a pesticide sprayer loading area and wash down area
2.2	Installation of biobed
2.3	Installation of biofilter
2.4	Provision of pesticide storage unit
2.5	Contractor for weed wiping to replace MCPA use
Protection of watercourse from stock & alternative drinking points	
3.1	Stock fencing on watercourses
3.2	Tree Planting next to Watercourses
3.3	Alternative Stock Drinking Points - Water Trough *(including base)*
3.4	Alternative Stock Drinking Points – Cattle Operated Pasture Pump *(including base)*
Reduction in surface flow across farm	
4.1	Gateway relocation
4.2	Improvement of farm tracks and access routes
4.3	Clean and dirty water separation
4.4	Sedimentation traps and Interception ponds
Peatland Management	
5.1	Drain blocking
5.2	Restoration of peat without plant cover - nurse crop
5.3	Restoration of peat without plant cover - brash spreading
Other	
6.1	Farmer Innovation

Impact of the LIS on water quality

223 WEMPs produced and water quality **measures were implemented on 118 farms.**

Reduced MCPA concentrations and loads in the river were achieved where boom spraying of MCPA was replaced with weed wiping.

Decreasing trends in turbidity were detected in the River Derg and can be attributed to measures such as livestock exclusion fencing to prevent river bank erosion.

CASE STUDY

Tullychurry Peat Restoration Site

source to tap peatlands for water

Aim: To restore an area of previously afforested peat back to peat bog by trialling new techniques and by measuring the recovery of the water table by way of comparison. If successful, these techniques could be used in other drinking water catchments.

Location: A section of previously afforested blanket bog, known as Tullychurry Forest, County Fermanagh, was offered by Forest Service (DAERA) for restoration as part of the project.

Restoration techniques

Work started at the end of October 2021 using 2 excavators with 0.5m wide tracks and a 1.2m bucket. The work at the site took around 11 weeks to complete.

Area 1: Intensive Restoration - 145 cell bunds were constructed, comprising low watertight peat walls, placed in grids (or cells) to prevent water from escaping. An average of 16 cells were built per week by the 2 excavators, depending on weather and ground conditions
Area 2: Drain Blocking - 237 peat drains and brash mats were blocked using peat wave dams. Dams were inserted every 10 to 12m (8m on steeper sections).
Area 3: Control Area – replicating Forest Service (DAERA) best practice when leaving a site and not re-planting.
Shallow groundwater dip wells were installed in each of these areas and in an area of open moorland and a forest remnant. Water levels and colour were monitored.

Impact of peat restoration

Only one season of monitoring results were available and show larger fluctuations in water level and high colour in the cell bunded area compared to the results in the control and open moorland areas. This is expected following high levels of disturbance in the restoration area and further monitoring is required. The technique has already been implemented in the nearby Lough Bradan drinking water catchment. Increased biodiversity has been noted at Tullychurry, including more diverse assemblages of bog flora.

The Source to Tap project would like to thank Forest Service (DAERA) for the use of their land for this pilot. Without their help, this pilot project would not have been possible.

A Call to Action!

At the start of this INTERREG VA journey, our six separate organisations, although sharing common aspirations, had our own unique focus and agenda. The EU INTERREG VA funding has enabled us to come together as a partnership with a shared vision to deliver sustainable solutions which help us to manage water quality in our shared cross border river basins.

By using this partnership approach, we have demonstrated that by providing funding for environmental projects it can effectively deliver on the ground. By pooling the skills from several organisations and increasing capacity, we have a greater reach across the political border to make a tangible difference to drinking water source protection. That is perhaps the biggest achievement of this project. Our partnership and 'can do' attitude has delivered more than we ever set out to do! The scientific skills of AFBI and Ulster University, together with work by AFBI economists have provided us with an evidence base to persuade others to act. NI Water, Irish Water and The Rivers Trust's increased capacity to engage the public in catchment management will continue to pay dividends beyond this project. This evidence can and should be used across the island of Ireland to support the fight against climate change and water protection. Through the learning gained on peatland restoration, forestry management, agricultural land use improvements and education we have embarked on a journey. We need to continue with others who are joining us on this journey in loving the water we all rely on to thrive.

As David Attenborough said, on 22nd March 2022, –
"We know what the problems are and we know how to solve them. All we lack is unified action."

The last five years of Source to Tap have shown us what to do – through our legacy website we will share that knowledge and we need others to take the learning and do it now.

The Legacy of Source to Tap

The final output of the Source to Tap Project is a legacy website, outlining our approach to sustainable, cost-effective, catchment management, designed to protect source drinking water catchments.

We wanted to make the outputs accessible to everyone, allowing stakeholders across the water utility, scientific, policy, community, and education sectors to benefit from the information generated by this innovative and ground-breaking project.

To achieve this, we have developed a legacy website that allows Water Professionals & Land Managers, Landowners & Farmers and Educators & Citizen Scientists to explore what the Source to Tap project has delivered, the key outcomes and learnings from the project and how this learning can be replicated and applied in other river catchments.

The legacy website also contains a wealth of downloadable resources, from a 5-unit primary education programme that teachers can deliver in school, and information fact sheets for freshwater citizen scientists to information sheets for landowners and farmers about water-friendly farming.

Whether you just want to scratch the surface of integrated catchment management for source drinking water protection or immerse yourself in the science and economics behind our approach, the Source to Tap legacy website has something for everyone.

Visit www.sourcetotap.eu

Notes

Disclaimer
The views and opinions expressed in this document do not necessarily reflect those of the European Commission or the Special EU Programmes Body (SEUPB).