

# newsletter

Autumn 2020 - Issue 4

## Community Group monitors Health of River Finn



Three community projects were funded in the Finn Catchment as part of Phase 1 of the Community Incentive Scheme, these being 'The Finn through the lens', 'Coiste Slí Taobh an Mhuilinn' (Millside Walk) and 'The Finn Anti-Pollution Project', also known as FinnAPP.

The Finn Anti-Pollution Project is a local community group from the Glenmore-Welchtown area which is monitoring the health of their local rivers using specialist monitoring equipment. The group surveyed three sites over Corlackey Burn and the Finn River at weekly intervals throughout the course of the year. Parameters such as Conductivity, pH, Dissolved Oxygen and Temperature were recorded.

Simple nitrogen and phosphorus test kits were issued to the group to determine the concentration of the target analyte in the water sample. The group also received training in using the equipment prior to using it on the rivers. For the duration of the project the Loughs Agency will conduct the re-calibration of the equipment for the group at monthly intervals. The Agency has also designed the data recording format and will conduct regular checks to detect anomalies or potential errors.

The FinnAPP group has also been supplied with PPE such as life jackets, wellies, waders, disposable gloves and antiseptic wipes. Risk Assessments have also been supplied to the group so that all activities can be carried out safely and with minimal risk to all participating.

Data will be collected on Survey123 and uploaded to a dashboard which can be viewed by the group and CatchmentCARE staff. It is hoped that more groups will apply with a similar programme design in the 2020 CIS round.

### A Word from the Project Manager

Welcome to the latest CatchmentCARE Project's Newsletter. As society learns to accept the new norms associated with the coronavirus, so too for the CatchmentCARE team who have been learning how best to deliver works whilst staying safe.

In-stream and riparian works are progressing in the three catchments (Arney, Blackwater and The Finn) with some of the Blackwater works being done in conjunction with DAERA.

The Groundwater Team have completed some of their tender processes and have commenced drilling for the groundwater monitoring stations at the Finn with works to follow in the Derg catchment. Flow monitoring and water quality analyses will follow. Keep any eye out for their work in conjunction with a community group who will be dye tracing springs in the marble arch area which should be very interesting.

In the Finn catchment, the Project is addressing a chemical issue which may be related to forestry or possibly sheep dipping activities. The project is working closely with the farming community on the promotion of a best practice approach to sheep dipping and the disposal of spent dip. Together with Teagasc, we held the first of a series of Sheep Dip Demonstration Days on the 17th September, which was restricted to 15 attendees.

However, in another example of how this Project is adapting to the pandemic, the event was recorded and will be published shortly on our social media channels and nationally in conjunction with Teagasc.

The Phase 2 of the popular and successful Community Incentive Scheme (CIS) was launched in August 2020 which remains open now until the 2nd October 2020 which we are looking forward to working through with the various communities involved.

Unfortunately our planned midterm conference has had to be postponed and is currently rescheduled for the 18th February 2021 at the Four Seasons Hotel & Leisure Club, in Monaghan.

Finally some good news on the Education Programme which was previously ready to roll but then restricted. Andy Griggs and his team have been thinking outside the box and are managing to deliver the Education contract despite the restrictions in place. They are currently developing a series of online videos which will replace some of the planned works and are doing so with CatchmentCARE Partners contributing to video chapters to follow.

Check out more on [catchmentcare.eu](http://catchmentcare.eu)



# High Praise for Armagh Anglers CIS Project



One of the Blackwater Catchment's recently completed CIS projects in Armagh has come in for special thanks from the club's Chairman.

The Armagh Anglers was funded by the CIS to carry out improvement works at Lowry's Lake in Armagh. The work entailed providing safe access around the lake for the local community and club members; a specialised piece of equipment called a Neptune Rake was also purchased to help remove non-native Nuttalls pond weed from the lake.

The group was so pleased with the results of the project that its Chairman, Aidan Donnelly, sent a letter to the CatchmentCARE team, expressing his and the group's thanks at the completed works. Aidan pointed out the project has meant that the group can now safely progress with efforts to enhance and improve water quality, which will have a very positive effect on the lake, angling and the local community. He also stated that the project has



increased interest in the lake environment, with people increasingly using the lake for angling, walking and general recreation in relation to nature.

The club can now look forward to the care, development and promotion of Lowry's Lake as a community asset, which will allow people to value the waterway and improve awareness around water quality. The letter also highlighted the partnership approach taken with CatchmentCARE and mentioned the plans the group have to build on the work; they are also looking into the possibility of applying for further funding using the experience they have gained on this project.

The project is an excellent example of what CatchmentCARE is about – making a difference on the ground to local communities and helping them to care for their water resources and catchments, both now and in the future.

## CatchmentCARE Education Programme goes On-line

A key success of CatchmentCARE has been the schools engagement work being delivered by educators from the River Backwater Catchment Trust.

In 2020 plans were set in place to build on the success of the 2019 pilot education programme and encourage the 8 schools that participated in the pilot programme to incorporate elements into the core school curriculum through a series of teacher training events and curriculum planning activities. Plans were also in place to engage with 6 new schools, which would avail of the pilot programme, receiving in-school visits and visits to local rivers.

The programme was due to start in February 2020 but because of Covid 19 has been postponed until schools are allowed to let visitors back into the classroom and to run off site schools trips.

Rather than mothball the CatchmentCARE project however, new on-line river based education resources are being developed in partnership with the River Blackwater Catchment Trust and other educators working on the CatchmentCARE project.

The video clips will use the river as a resource to help teach key parts of the Key Stage 2 Curriculum in numeracy and literacy. The videos will include the following elements –

- "The River– Where it all begins"
- "How to build a river"
- "Creatures of the River"
- "The Magic Moving River"
- "All my fault!"



# River Works progressing in Blackwater Catchment

Water quality improvement works have been progressing well in recent months in the Blackwater Catchment thanks to ABC staff who has been working hard to develop and deliver Riparian and In-Stream works around the Ballygawley area of the Catchment.

**Ballygawley** Phase 1 is a joint project with DAERA Inland Fisheries, who are delivering the instream elements of the project. Works taking place include:

- Installing fencing along rivers to help decrease erosion of banks by cattle
- Supplying and installing livestock drinkers for local farmers
- Installing field gates and stiles to provide access for farmers and local user groups.
- Planting native species of trees and riverside vegetation to help stabilise riverbanks and create a buffer strip between the river and agricultural land.
- Installing bank revetments and other in-stream

works such as rubble mats and flow deflectors (to create a more diverse flow and habitat in the river channel).

The Upper Blackwater Improvement Scheme is another recently started project that entails a range of similar works to the Ballygawley scheme along a 4km stretch of the main Blackwater channel.

Other works going to tender in the coming months include improvements on the Callan River, Tynan River and Mountain Water. Riparian works on these projects will be progressed during the winter of 2020 with in-stream works commencing early in March 2021.

For more information on this and other Blackwater catchment works please contact Tom Woods on [thomas.woods@armaghbanbridgecraigavon.gov.uk](mailto:thomas.woods@armaghbanbridgecraigavon.gov.uk)



## Phase 2 of Community Incentive Scheme launched



"John Kelly from the Speleological Union of Ireland (SUI) receives delivery of specialist equipment for a water tracing project in the Arney Catchment".

Phase 2 of the Community Incentive Scheme (CIS) was recently open for applications from local communities to support cross border river catchment improvement projects in the rivers Arney, Blackwater and Finn.

Project funding of up to €25,000 was available through the CIS to support communities interested in looking after their local river systems and associated lakes. The scheme was open to a wide variety of organisations including volunteer groups, community groups, NGOs, schools and third level education organisations, youth groups and sports clubs, not for profit organisations and farming groups.

CatchmentCARE has already implemented a successful first phase of the CIS grant scheme in 2019, where 17 community based projects were funded across the project's three catchment areas.

Projects supported include practical water-quality improvement projects, education and awareness campaigns, access to loughs and rivers for local communities, volunteer training, specialised equipment, community river trails, bio-blitzes, citizen science projects and interpretation and signage.



# Experts' evaluate Risk of Phosphorus Loss from Farmyards

Farmyards are a potential source of phosphorus which, if not managed correctly, can be lost to watercourses and contribute to eutrophication. In a new scientific paper from the Agri-Food and Biosciences Institute (AFBI) the runoff, management, and infrastructure factors that control phosphorus risk were ranked by 147 experts from the water quality, farm advisory, policy, and research sectors.

The results of the survey found that silage effluent was prioritised as the greatest risk factor. Effluent is produced in the first 2 weeks after ensiling; however, if rainwater enters the pit or silage bales it can be released at other times (*Picture 1*).

All silage effluent must be safely collected in storage tanks and wilting can minimise its

production (*Picture 2*). Runoff from the farmyard to watercourses or to farm drains was also considered to be a major risk factor. Preventing these discharges by "breaking the pathway" e.g. by diverting water runoff to storage tanks, reduces the risk to watercourses. The frequency of yard cleaning was also highly ranked and is a cheap and effective way to reduce the phosphorus content in farmyard runoff during rainfall event

The finding of this survey has contributed to the development of a Farmyard Risk Assessment tool and will be implemented by on a voluntary basis in the coming months. In addition the AFBI team is monitoring runoff from farmyards (*Picture 3*) to measure the amounts of phosphorus lost during rainfall events.



*Picture 1:* Effluent from silage is produced just after ensiling but can leach out at other times if rainfall enters the pit or bales.



*Picture 2:* Wilting grass for at least 24-hrs significantly reduces effluent produced by silage.



*Picture 3:* AFBI is currently monitoring runoff from farmyards in the Blackwater catchment to quantify the amounts and timing of phosphorus loss from farmyards. This will help in devising effective strategies to reduce these risks.

## Taking the Guesswork out of Grassland Management

As part of AFBI's Farm Nutrient Management work, four hundred fields in the Blackwater catchment were soil sampled in early 2019. Regular soil sampling (once every 4-5 years) is extremely important in order to increase the efficiency of nutrient management on farms and improve soil health. Along with optimising grass yields, more efficient nutrient management minimises the loss of surplus nutrients to the environment. The Blackwater soil sampling revealed that two thirds (66%) of fields contained above optimum levels of soil phosphorus, but there were also areas of nutrient deficiency. In particular, low soil potash levels were found in 40% of fields sampled, and two thirds of fields (64%) were in need of lime.

Seventeen farmers in the CatchmentCARE Project received tailored nutrient management advice for their farm, along with slurry and grass silage analysis. Slurry is a very valuable source of nutrients, with a 2000 gal / acre application able to provide much of the nutrient requirements for early spring growth. Great care must be taken however to distribute slurry on fields where it is needed most, and to only apply slurry when field conditions are suitable and keeping distance from nearby waterways, following best management practice guidelines (see infographic on Good Agricultural Practice (ROI) and the Nutrient Action Programme (NI) at [www.catchmentcare.eu/publications](http://www.catchmentcare.eu/publications)).

For farms where soil phosphorus levels were high, farmers were advised not to apply additional chemical phosphorus fertilisers, particularly to fields receiving slurry applications. Grass silage analysis prior to first and second cut revealed that despite reducing or eliminating inorganic phosphorus fertiliser use, the grass obtained enough phosphorus from the soil for growth, and grass silage phosphorus levels were within the healthy range. While phosphorus tends to be in surplus, deficiencies of potash were evident in some of the silage fields; this is common across Ireland, as is the need for more frequent lime

applications. Early spring applications of sulphur are also beneficial, with AFBI research having shown potential yield losses of 30% due to sulphur deficiency.

One year on, with some simple changes to their grassland management, farmers have been able to maintain grass production on their farms, making efficient use of plant available nutrients while at the same time reducing the risk of loss of nutrients to the environment – a win-win situation for everyone!



Grass sampling will reveal any nutrient surplus or deficiencies in grass silage



Soil sample every 4-5 years and apply only the nutrients you need

## Finding Dykes

The groundwater team has been busy trying to find dykes, which are walls of molten rock that squeeze up through cracks in the earth's crust. A dyke's size can vary from only a metre or so up to 10's of metres wide.

In 2005, the Tellus project found that the north of Ireland has a very high density of dykes that have cut through the normal bedrock. This is thought to be significant when trying to understand groundwater; how it flows and how to manage it. Dykes are thought to be like big solid walls that prevent groundwater from passing through. This can create compartments within aquifers, which can result in contaminants becoming trapped behind these walls. Knowing where dykes are is therefore important when deciding where to install groundwater monitoring stations.

Paul Wilson from BGS and Mohammednur Desissa Ture from GSI performed magnetometer surveys over the top of two sites in the Blackwater Catchment, where the aim is to drill boreholes on either side of, and into, dykes so that tests can be performed to work out how they influence groundwater flow in limestone and sandstone

aquifers. This will be a world first since it is very difficult to locate dykes and decide where to drill. However, the Tellus data has enabled Mohammednur and Paul to design focused surveys that have pinpointed the locations of the dykes that cut across these sites.



The surveys used a magnetometer to pick up the earth's magnetic field. This is influenced by the rocks below and a magnetometer detects these small variations. Every time you walk over a dyke, the signal changes and if you do this across many different lines, you can build up a picture of the orientation, dip, and size of the dyke.

# Experts' evaluate Risk of Phosphorus Loss from Farmyards

As instream/riparian works are beginning to take place in all three catchments, it may be useful to highlight some of the measures being implemented.

A challenge with river restoration and water quality improvement projects can often be that different areas require differing solutions and there is no 'one size fits all'. However, a key method for improving rivers is to remove the pressures where possible. A number of pressures can be removed or reduced by installing fencing along the watercourse in areas of agricultural landuse. Passive restoration is a method that concentrates on eliminating harmful land management practices within a catchment and allowing the natural healing process to take place. Many rivers will recover if left alone, restoring natural channel dynamics.

Fencing out grazing animals provides significant improvements in riparian vegetation, bank stability and overall channel conditions and hydromorphology at a low cost. Natural recovery can be assisted by planting or reintroducing native flora. Fencing that completely excludes livestock eliminates the introduction of nutrients and pathogens from animals and allows for riparian vegetation to colonise free of grazing pressures.

In an Irish context, agriculture and waste water have been identified as substantial contributors of excess nutrients to watercourses. Buffer strips of riparian vegetation are one way to reduce this problem. Options include fencing an area and allowing the vegetation to re-establish or alternatively fencing an area and planting native species. Benefits include:

- *Fencing prevents livestock from entering water courses, thereby removing their impact on pollution from bank erosion and sedimentation or directly depositing manure in the water-course.*
- *Fencing allows a range of vegetation types to establish naturally. Relative to its extent in the*

*landscape, riparian vegetation has the capacity to generate a high return on ecosystem services.*

- *The riparian corridor will intercept nutrient and sediment run off from agricultural land. Excess sediments and nutrients can impact habitats and reduce oxygen levels in water.*

- *Riparian vegetation increases shade which reduces water temperatures. This will allow a more stable water temperature range in an era of climate change impacts.*

- *Riparian vegetation stabilises river banks with tree root systems. This reduces excess sediment from bank erosion and creates natural habitat for plant and animal species.*

- *Trees can encroach into the river forming diverse habitat features and contributing woody habitat and leaf litter to the river.*

- *The canopy provides "cover" for resident brown trout. It also creates a wildlife corridor which can be used by birds, bats and insects among other species.*

- *Riparian zones can help reduce peak flows in certain watercourses by slowing the water velocities further up the catchment.*

Sites will be monitored to assess improvements made to the watercourse (Figure 1). Monitoring may include fish, invertebrate, habitat data and drone data imagery (Figure 2).

Figure 1. River Dee (A) pre and (B) four years post livestock exclusion. (Image courtesy of Inland Fisheries Ireland Environmental River Enhancement Programme)

Figure 2. 3D orthomosaic of River Arney site pre-works noting livestock poaching areas. This site will be monitored post-works to assess changes in morphology and riparian vegetation assemblage.





## Chemical Export to Watercourses in the Finn Catchment

As part of the chemical export investigations the Loughs Agency team have carried out surveys on Sheep Dip and Forestry practices within the Finn catchment. These practices are potentially significant sources of herbicides and pesticides reaching local watercourses. Loughs Agency plan to use the information gathered in the surveys to introduce measures which it is hoped will reduce chemical escape into the waterbodies of the Finn Catchment.

An initial desk top study focused on chemicals commonly used in agriculture and forestry and looked at the nature of the chemical, the potential for introduction into the environment and its effect on macroinvertebrates and fish species. It also identified solutions and recommendations which could be implemented in the future.

Sheep dipping practices were identified as a significant source of chemical export from land into local watercourses. The CatchmentCARE team gathered information by attending sheep marts in the Finn area and asking farmers to complete questionnaires. The results helped the team understand how farmers use, handle and dispose of sheep dip. Based on the newly collected data, the survey team has now compiled a dashboard of 103 public and private sheep dipping locations.

There are plans for a training day organised by CatchmentCARE staff and Teagasc to be held in Autumn 2020 to help further educate the sheep farmers of the Finn catchment on best practice for sheep dipping and spent dip disposal.



The second contributor identified as potentially being a significant source of chemical export in the Finn catchment was Forestry. Within the

Finn Catchment, forestry covers around 108.41km<sup>2</sup> which is approximately 20% of the whole Finn Catchment area. The team completed survey work on Coillte sites throughout the Finn Catchment. Based on this survey, the team compiled a list of six Coillte sites which would be prime for implementing mitigation measures such as the planting of native broadleaf tree species, creating sumps or swale areas to improve filtration of sediment and chemicals, planting willow or birch in areas of water setback and woody debris dams along drainage gullies and edge of plantations.

The information collected will be used alongside data derived from EPA monitoring stations, previous Loughs Agency macroinvertebrates surveys and also Coillte's own water quality results to assess water quality in waterbodies adjacent to forested areas.

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### CatchmentCARE Project Partners

Lead Partner: Donegal County Council (DCC)

Partners:

- Agri-Food & Biosciences Institute (AFBI)
- Armagh City, Banbridge & Craigavon Borough Council (ABC)
- British Geological Survey (BGS)
- Geological Survey Ireland (GSI)
- Inland Fisheries Ireland (IFI)
- Loughs Agency (LA)
- Ulster University (UU)