

# Fisheries Internship Report

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# Statement

The six months that I have been an intern at Galloway Fisheries Trust have been some of the most enjoyable of my adult life. I have learned so much over these six months and I am so grateful for the having the opportunity to learn within such a supportive and positive team. The experience I have gained and the knowledge and skills that the internship has given me, will be crucial to my future career as a biologist.

Completing my undergraduate degree during the Covid-19 pandemic, had a huge impact on my ability to gain any field work experience and I lost out on the practical skills and confidence that a career in biology requires. During my six-month internship, I feel I have gained the missing practical skills through conducting surveys and collecting and handling data, as well as increased confidence in fish handling, report writing and planning. Moving between the different sections of GFT has given me an understanding of the different elements and pressures that are relevant to the local ecosystems and the relationship all these elements have to the environment as a whole.

One of the main lessons from my initial 6-months with GFT has been the importance of collaboration. The projects that I have been involved in, have all been the result of many different groups, individuals and companies who all play a key role in local conservation. Working alongside larger partners such as Drax, Glasgow University and Galloway Glens on the salmon smolt tagging project, showed that communication and understanding is incredibly beneficial to everyone involved. It was so rewarding to work on a project with so many passionate and interested parties and witness and assist with research that will hopefully lead to a lasting and obvious positive impact on the local salmon population.

I would like to thank Galloway Fisheries Trust, Galloway Glens Landscape Partnership and the Holywood Trust for this fantastic opportunity. This internship has allowed me to pursue my chosen career in a sector that I am passionate about in the area that I grew up. I would not have been able to gain this level of experience across such a range of areas without this opportunity.

## Key Projects

### Smolt Tagging

As I mentioned in my statement, the main project that I was involved in throughout my internship was a collaborative salmon smolt tracking project. This project involved tagging salmon smolts at 2 burns in the upper River Dee and deploying acoustic receivers to track the movement and survival of the salmon smolts through the large hydro scheme that spans the Dee. My internship began just as the project was beginning and I was so grateful to be allowed to assist with every step of this project: gaining access permissions, deploying receivers, deploying and checking Fyke nets, assisting with tag insertion and smolt surgery, releasing fish, collecting receivers and planning, navigation and communication with Drax and Glasgow University. It was a massive project and there were setbacks and problems but experiencing the meticulous planning and the problem solving and the hard work, effort and passion that went into this project was my favourite part of the whole 6 months.



Deploying acoustic receiver at Tongland Dam

### Electrofishing

Electrofishing is one of the main forms of fieldwork I have experienced at GFT. It can be used as a method of surveying for juvenile fish as a measure of population density, which is very helpful in tracking and monitoring fish stocks annually. Electrofishing is also used during windfarm consultations to generate baselines for monitoring the impacts of the windfarm on the surrounding environment. It typically involves a team of three, one team leader and 2 netters (1 banner and 1 hand net). This year we were involved in a Scotland wide government run project, NEPS (national electrofishing program of Scotland), which involves the random generation of electrofishing sites. GFT had 30 sites throughout the 7 Galloway catchment, as well as 30 sites on the Annan. I completed an Intro to Electrofishing course and became a crucial and valued member of the NEPS teams and gained experience in netting, fish processing,

navigation, data recording and survey area mapping. I also assisted with GFT's annual electrofishing sites and discovered a genuine love for fish surveys.

## Water Quality and Temperature Monitoring

I had the chance to travel to Blairgowrie and attend an SFCC kick sampling course, that included invertebrate identification. This course was incredibly interesting: I learned a brand-new skill and met with biologists from other fisheries trusts as well as gained knowledge about invertebrates and their role in the river ecosystem. This course led to me assisting with a water quality project around Loch Ken. This was primarily a project to build a baseline on invertebrate populations in Loch Ken and gather and test water samples for water quality monitoring.

Once kick samples have been collected, they must be doused in alcohol to preserve them and then identified in order to work out the number of taxa and WHPT score. This can then be run through software which compares what should be there to what was found reflecting the health of the watercourse the sample was taken from. As aquatic invertebrates are sensitive to certain conditions in water an excess or lack of a species can indicate if the water is too acidic or too low in phosphorus etc.



Kicksampling at Blairgowrie

I was also involved in a Fungus Monitoring Project at Tongland Power station, this project has been ongoing for several years since an outbreak of fungus in the fish ladder caused unusually high fish mortality. It involves the deployment of TinyTag temperature loggers at different stages of the Tongland Dam to monitor temperatures and compare the temperature differences at separate sections. The concern was that water temperatures in the fish ladder were higher than in other parts of the river, causing increased fish stress and increased incidence of fungus. The temperature loggers are deployed in 5 different sections: 2 are in different pools of the fish ladder, 1 at the base of the fish ladder where it joins the river again, 1 a few hundred metres downstream of the dam and the final one is just beyond the power station. The temperature loggers are deployed around March and then removed in October, with the data being collected every 3 months. After collecting the data in June, I was tasked with writing a summary of the temperature changes and creating graphs to highlight any important increases or differences, this allowed me to practice my data handling and interpretation, alongside working with new software to transfer the data from the loggers into a workable form.

## INNS

Invasive Non-Native Species (INNS) can have a major impact on the health of an ecosystem. Working with the INNS officer at GFT, I assisted with the surveying and control of multiple INNS across Galloway. The invasive plants of the Galloway catchment are mainly Japanese Knotweed, Skunk Cabbage and Giant Hogweed. I gained certifications in pesticide application which enabled me to assist with eradication of the invasive plants and gave me the opportunity to witness the impacts first-hand and gain experience with plant identification and presence/absence surveys.



Surveying Giant Hogweed on River Urr

## eDNA Sampling

I was very lucky to be given the chance to lead an eDNA project close to the end of my internship. The project was funded and organised by the Marine Directorate who selected 30 rivers across Scotland to be sampled as a way of detecting the presence of invasive species, Pink salmon. eDNA is a relatively new monitoring technique that involves filtering water samples through a 0.45  $\mu\text{m}$  filter and sending the filters away for PCR testing in a lab. This project involved visiting 6 sites across 2 river catchments and collecting and filtering 3 water samples from each site. This project, while being something that I personally was incredibly interested in, also gave me the opportunity to plan and research independently and lead a small team to execute the project. It gave me the chance to demonstrate to GFT and myself that I had learned and retained the information and skills necessary to implement a project and effectively gather data.



Collecting water sample for eDNA



eDNA riverbank filtering equipment

## Training

- SFCC Intro to Electrofishing Course
- Kick Sampling and Invertebrate Identification
- PA1 and PA6AW Pesticide Application Qualifications
- Introduction to Hydromorphology- River Restoration Centre Online Course
- Emergency First Aid
- Freshwater Biology and Fisheries Management Units via Institute of Fisheries Management
- EMSS Health and Safety

## Skills

- Communication
- Collaboration
- Organisation/Planning
- Leadership
- Teamwork
- Electrofishing
- Surveying: Quantitative and Timed Fish Density , Habitat, INNS
- Attention to Detail
- Data handling and recording
- Confidence
- Navigation
- Working in a professional environment
- Risk Assessment and Health and Safety
- First Aid