

GALLOWAY HYDROS FISHERIES MANAGEMENT

Overview

The Galloway hydro-electric scheme generates 'green' energy by harnessing the forces of water. The scheme covers an area of 400 square miles in Ayrshire and Galloway and consists of six stations, eight dams, tunnels, aqueducts and pipelines.

The hydro scheme was designed and built with great consideration for the environment, particularly the interests of fishing.

This factsheet describes the work by the Galloway Hydros, in liaison with stakeholders, to maintain and improve the management of fisheries within the scheme.



Introduction

In the mid 1930s, a series of dams was built on the Rivers Deugh, Ken and Dee to store water for the Galloway hydro-electric scheme. This altered the landscape, creating reservoirs, wetlands and fens with their own special biodiversity interest.

At an early stage in the planning for the scheme, a need was recognised to preserve the spawning grounds of Atlantic Salmon in the upper reaches of the Rivers Doon, Ken and Dee. Migratory Salmon return from the sea each year to spawn – historically, many of the Dee's fish were caught at the Douches of Tongland, a notorious commercial salmon trap. Construction of the hydro scheme rendered the Douches ineffective, allowing more Salmon to enter the river system.

In his book Tunnel and Dam, George Hill wrote: 'Their (the Douches) obliteration would be hailed with joy by everyone interested in the Dee's fishing. It was hoped that this would help offset any loss of fish caused by changes of river habitat and fish access resulting from the scheme.'

To enable Salmon to overcome the physical barriers to migration presented by the scheme's dams, fish ladders were built at Tongland, Earlstoun, Carsfad and Loch Doon reservoirs. The ladders consist of a series of ascending pools, some of which are large resting pools, each connected by a submerged gate into the reservoir through which the fish can swim. Meanwhile, compensation flows are maintained on the rivers Doon, Ken and Blackwater of Dee to ensure sufficient running water for fish movements.



The fishladder at Earlstoun

Supporting Research and Strategy

The Galloway Hydros works with a range of stakeholders to conserve stocks of Atlantic Salmon and other fish species throughout the scheme.

Concern has been expressed about stocks of Atlantic Salmon with the World Wide Fund for Nature estimating that catches in Scottish rivers declined by 25% between 1970 and 2000. On the Kirkcudbrightshire-Dee only 50-60 salmon are caught each season, compared with around 1,000 at the height of its fame as a game fishery.

Galloway Hydros co-operates with interested parties, including the Scottish Fisheries Committee, the Galloway Fisheries Trust (GFT), Kirkcudbrightshire Dee District Salmon Fishery Board (KDDSF), Doon District Salmon Fisheries Board (DDSF) and Ayrshire Rivers Trust (ART), as well as many local angling clubs, to reverse the trend. ScottishPower's key area of support currently is sponsoring ongoing research work into the status and movements of salmon on the rivers within the system.

The Hydros also support high-level action and, in 2007, funded the writing of a Salmon Management Plan for the Dee catchment. The Scottish Fisheries Committee, in its 2008 annual report, said it was 'encouraged' by the partnership approach between ScottishPower and its stakeholders to develop the strategy. The Plan examined all the available information on the river's salmon population, water quality and other biological data to gain a clearer picture of the health of the river and its fish. It considered the potential and actual threats to the river's salmon and laid out a five-year work programme to address areas of concern.

Jamie Ribbens, senior biologist with GFT, said: 'The plan is ambitious but the suggested actions will ensure the long-term recovery of the Dee's salmon stocks.'

The Hydros is also a founding partner of the Dee-Ken Catchment Management Plan that promotes the sustainability of the area's water resource. The Plan recognises the 'significant positive' effects of the hydro scheme, especially the creation of areas of open standing water, wetland and marshland habitats for wildlife. The hydro scheme is backing several aims of the Plan to build on the best practice operation already developed, such as disseminating results of research and maintaining fish ladders.

The Hydros operates a biodiversity action plan (BAP) that contains a series of possible long-term actions to improve the passage of migratory fish. These include studies into installing fish passes to further encourage salmon to use the fish ladders, putting in place fish counters at Earlstoun and Carsfad, and options to encourage fish migration, and its monitoring, beyond Kendoon Dam.



Downloading data from the Vaki fish counter computer at Tongland Dam

Other Species

Loch Ken is famed as one of the best coarse fishing destinations in Scotland. The loch, part of the Galloway scheme, has Pike, Perch, Roach, Rudd, Bream, Carp and Ruffe.

Many anglers try to catch the impressive Pike that lurk beneath its waters – the infamous Kenmure Pike is reputed to have weighed 72lb!

At the north of the scheme, Loch Doon is designated as a Site of Special Scientific Interest for its relict population of Arctic Charr – the species' only site in southern Scotland.

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Working in Partnership to Preserve the Dee's Salmon

The Kirkcudbrightshire Dee is the largest river in Galloway and drains a catchment area of more than 1,050 km² in South Ayrshire and Galloway.

The Dee was once famed as one of the best salmon rivers in southwest Scotland - but for various reasons stocks have fallen to low numbers. The Galloway Hydros is working with Kirkcudbrightshire Dee District Salmon Fishery Board and Galloway Fisheries Trust (GFT) on projects to protect existing salmon stocks and encourage their recovery.

Vaki Riverwatcher

In 2007 ScottishPower began working with GFT on the installation of a Vaki Riverwatcher fish counter in an upper holding pool at Tongland fish ladder to collect accurate data on Salmon and Sea Trout entering the Dee system. When a fish swims through the Vaki scanner unit it interrupts beams of infrared light, producing a silhouette that's used to calculate its size. Detection of a fish also triggers a camera to take a series of photos or short video clip. In the end, a file is created for each fish giving details on date/time of passage through the Vaki, depth and length of the fish, its speed and direction of movement.

Results for the past 4 years show that an average of nearly 900 salmon pass through the fish ladder each year. Seasonal trends in salmon movement across the last four years has generally shown that there is greatest return of salmon during the summer when grilse (one sea-wintered salmon) and multi sea-wintered salmon are both in abundance.

Rowan Armstrong, fisheries biologist with the Trust, said: 'We are really pleased with the performance of the Vaki. It is producing good data on the number and size of every salmon and sea trout passing up the Dee - and it is providing photos which is something we have never had before.'

Tagging Project

In order to investigate concerns that adult Salmon may have difficulty accessing and passing through Tongland fish ladder a salmon tagging project was started in 2007 and 2008 with GFT.

Galloway Fisheries Trust and Marine Scotland Science trapped and tagged a number of adult Salmon with a Passive Integrated Transponder (PIT) tag. PIT tag detectors were located along the ladder to detect tagged fish and track their exact route and the time it took them to pass through. The results of the study have suggested that Tongland fish pass is sufficiently designed to allow salmon to pass with no great difficulty.

Salmon Hatchery

ScottishPower has also funded the construction and meets the running costs of a salmon hatchery near Loch Ken to restock the Dee. The state-of-the-art facility can hold up to 300,000 eggs which are harvested from hen fish of local origin and cared for until they hatch. The fry are moved to tanks where they are fed for about a month before being released into suitable nursery burns - in spring 2009, around 97,000 fry were returned to the Dee.

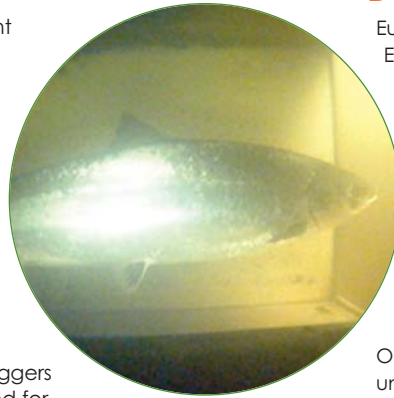
Jamie Ribbens, the GFT's senior biologist, said: 'The programme allows young fish to be added to good nursery burns even if adult salmon have problems getting to them.'

Stocking sites are monitored by GFT to ensure that stocked fish are healthy and surviving well.

Radio and Acoustic Tagging

Findings from the PIT tagging study indicate that some tagged fish take lengthy periods (up to four months) to reach the entrance to the fish pass. GFT will be investigating the path of the fish with a combination of radio and acoustic tagging on salmon in the lower river (beneath Tongland Power Station and up to the fish pass),

For further details about the work of the GFT, log on to: www.gallowayfisheriestrust.org



A spring salmon ascending through the Vaki Riverwatcher, April 2010. Courtesy of GFT

Dee Eel Restoration Project

European Eels are now categorised as Critically Endangered in the IUCN (International Union for Conservation of Nature) Red List due to a sharp decline in the population of more than 80% in the past three generations. This has prompted much interest in the species over the last two years and immediate action to help focus efforts in conserving the species was addressed within the Solway Tweed River Basin District Eel Management Plan (2010).

One particular concern of the GFT was that eels were unable to negotiate Tongland fish pass, at the south end of the hydro-electric scheme. To enable young eels to get past Tongland Dam un-aided, would require an extensive eel ladder to be built which would be substantial in length (to mirror the existing salmon and sea trout friendly fish pass of 200+ metres) and cost. With this option presently unavailable, capturing eels by means of trapping and then transporting them upstream of Tongland Dam has been seen as the most feasible option.

Galloway Hydros support GFT with monitoring the two eel traps beneath the downstream entrance to Tongland fish pass. All eels caught are transported above the dam and replaced into small burns with good habitat within the lower river. Here, they will disperse from and begin their lengthy stay in the Kirkcudbrightshire Dee (usually between 10 and 20 years). Trapping will continue in 2012.

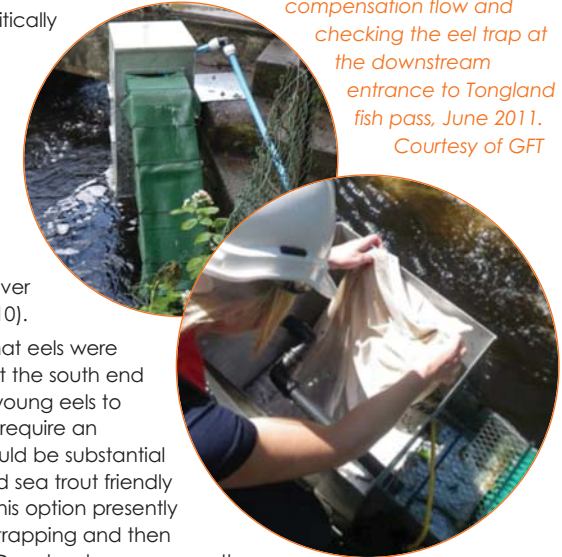
Aside from the benefits to biodiversity that re-establishing a Dee Eel Population will play; eels are known to be voracious predators of young American Signal Crayfish which are well established in Loch Ken and its feeder burns. This restoration project is hoped to, in time, help deal with the rivers crayfish problem.

Research into River Doon Pearl Mussels

The Galloway Hydros has backed research into the endangered Freshwater Pearl Mussel to help reverse its decline in a former South of Scotland stronghold. The once thriving population of the UK Biodiversity Action Plan species in the River Doon is facing extinction with a low number found in a 2007-08 survey.

In 2009, the Hydros and Scottish Natural Heritage jointly-funded new studies by Ayrshire Rivers Trust (ART) to search the riverbed for juvenile mussels. The Trust's Brian Shaw said: 'The Doon once had a fishery for Freshwater Pearl Mussels (FWPM). However, past surveys found low densities with no evidence of recent recruitment into the population.'

The key focus in summer 2009 was a survey of the river sediments to search for juveniles that bury deep into the silt - this would provide evidence that the remaining population is self-sustaining. Sites on the Rivers Doon and Girvan were also re-checked for adult mussels and any found were genetically sampled. Results have provided key information for future management of the rivers, including the feasibility of a long-term captive breeding programme to restock the river.



The eel trap at Tongland dam compensation flow and checking the eel trap at the downstream entrance to Tongland fish pass, June 2011. Courtesy of GFT