

From: AFBI FAEB To: AFBI FoI Officer, 22/10/2020

Re: Freedom of information request Stranmillis Weir eel Pass, sent simultaneously to DAERA inland Fish and AFBI

Original request :

Dear Sir/Madam,

We request info on the plans and specifications for the ascending eel pass installed on Stranmillis Weir fish pass Belfast and details of the project team involved in the project and when it was installed.

We request the validation results that the fish pass was working when installed for eel passage and the verification of eel passage results since its installation.

All in digital pdf format.

Many Thanks,

**Response from AFBI FAEB to both AFBI FoI Officer and DAERA Inland Fisheries** , to assist reply.

#### **When the Pass was installed...?**

The Stranmillis Weir Fish Pass structure for ascending salmon and sea trout was built prior to AFBI's research on salmon reintroduction began in 1989/ 199. Rivers agency who own the structure May have the Precise date, possibly contemporaneous with the level control gate construction

The fish pass channel section was repaired and had new mahogany baffles, to the standard MAFF "Denil" type salmon pass design, placed in the channel, Circa late 1980s

In May 2014, Some of the Baffles for the salmon pass were noted on DCAL Inland Fisheries officer's inspection to be loose and were scheduled for inspection, repair or replacement as appropriate by Rivers Agency

At this time (May 2014) AFBI were consulted on the possibility of incorporating improved eel passage for upstream migration of elvers within the salmon pass.

While it was known at the time that eel could already ascend the pass, given available designs to improve passage, and case studies in the England and Wales Environment Agency fish pass manual, It was decided to incorporate an elver climbing medium within the salmon pass

The pass was back in operation for the 2014 salmon run.

#### **The Project team?**

The staff involved in 2014 consisted of a DCAL Inland Fisheries Area Officer, Rivers Agency engineering staff and a scientific advisor in AFBI

## Plans and Specifications?

### Notes on Design, sent by AFBI to Rivers agency in 2014, are appended at end of this FoI report

Initial discussions Between AFBI, DAERA and Rivers agency who were taking on the repair work centred on replacing the salmon pass baffles with new materials, but on removal and cleaning by rivers agency the 1980s mahogany hardwood was found to be in sound condition, and strong enough to allow a section of each baffle removed adjacent to one wall (right hand facing upstream) and the baffles replaced with a slot cut to allow insertion of the eel climbing medium

The eel pass had to be fitted without interfering with salmon passage and counting

Standard eel climbing medium (Bristle mat) was sourced by DCAL/Rivers agency from a GB supplier.

The Bristle mat was installed against the right hand wall of the pass, inserted through the salmon pass baffles, spanning the range of heights of water from low flow to high and low tide

### Validation

The bristle mat was added as an improvement to bring the pass of eel up to new standard practice, taking the opportunity while the salmonid pass baffles were out for cleaning and refit.

**It is important to note that the site was not impassable to ascending elvers prior to this addition.**

**This evidenced by:**

- Routine and regular observations of elver, not generally recorded as not unusual, during use of a salmon adult and smolt trap and adult upstream counter starting in the 1990s. During the spring salmon smolt run, pigmented elvers were regularly visible dropping out of the moss covered walls on draining the pass for trap and counter maintenance. This continues to be the case to the present day (2020) when elvers are present in the estuary in spring. Note that while due to weir repair/ construction activity and then Covid restrictions, there has been very limited salmon research activity on site since early 2019, the fish pass, however, continues to operate.
- The presence of eel upstream of Stranmillis in the Lagan and its tributaries, routinely seen in electrofishing surveys for WFD status, The River lagan site at Shaws Bridge/Newforge has been assessed by fully quantitative electrofishing on two occasions in the past decade: the site yielded: 117 eels, length range 8-36 cm in 2009 and 33 eels in 2013, lengths 10-43 cm. Eels of this size range are circa 0+ to 10+ years old. This shows that even was before addition of bristle mats in 2014, substantial numbers of eel ascended past Stranmillis weir circa 2009 to 2013
- Salmon and trout surveys by electrofishing (annual since 1993) routinely detect eel of multiple ages and sizes, particularly in the Minnowburn, and Ravernet tributaries. These eel must have at some point ascended past stranmillis. The written data records focus on salmon and are reliable for eel presence/absence only.
- In August 2020, fyke netting of Hillsborough main lake caught and allowed measurements of the presence of eel of lengths size 340 to 830 mm. These correspond to ages of 10 to 20 years since ascent from the sea and demonstrate not just their ability to ascend the Lower Lagan, but also from the Lagan up the hillsborough stream, backdating to circa year 2000 to 2010.

**As there was no time series data on ascending elver before, with eel known to be able to ascend prior to the improvement, and eel recruitment from the sea is variable and currently low, absolute quantification of eel climbing the pass before and after bristle mat insertion is not possible**

**Passability for ascending elver since addition of eel climbing material eel after 2014 (No Quantitative assessment is possible) is evidenced by:**

- Continued regular observation by staff (pers.comm) of elvers in the pass channel, upstream of the salmon baffles, particularly in the voids between the walls and the salmon counter box. These then have free access to the river.
- Salmon and trout surveys by electrofishing (annual since 1993 and continuing post 2014) routinely detect eel of multiple ages and sizes, particularly in the Minnowburn, and Ravernet tributaries. These eel must have ascended past Stranmillis
- It cannot be stated categorically that more or higher proportions of available elvers climb Stranmillis weir than before 2014, as the starting numbers entering the estuary each year are not known. Site passability for eel is, however, now up to a modern design standard for a salmon pass

**Appendix to FoI request October 2020 – Design notes from AFBI to DCAL /Rivers Agency, From May 2014**

**4.12 Downstream view of pass installation at Frog Mill, River Hamble (NGR: 5222 1491). Note the area of slack water on left for elver and eel to enter pass.**



**Figure 4.13: Installed pass, showing brackets and fixings**

Image From EA (England and Wales) Eel pass manual showing bristle mat board placed against a wall

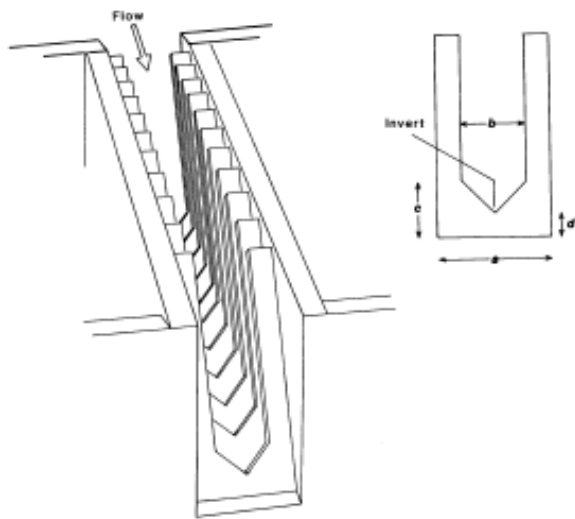
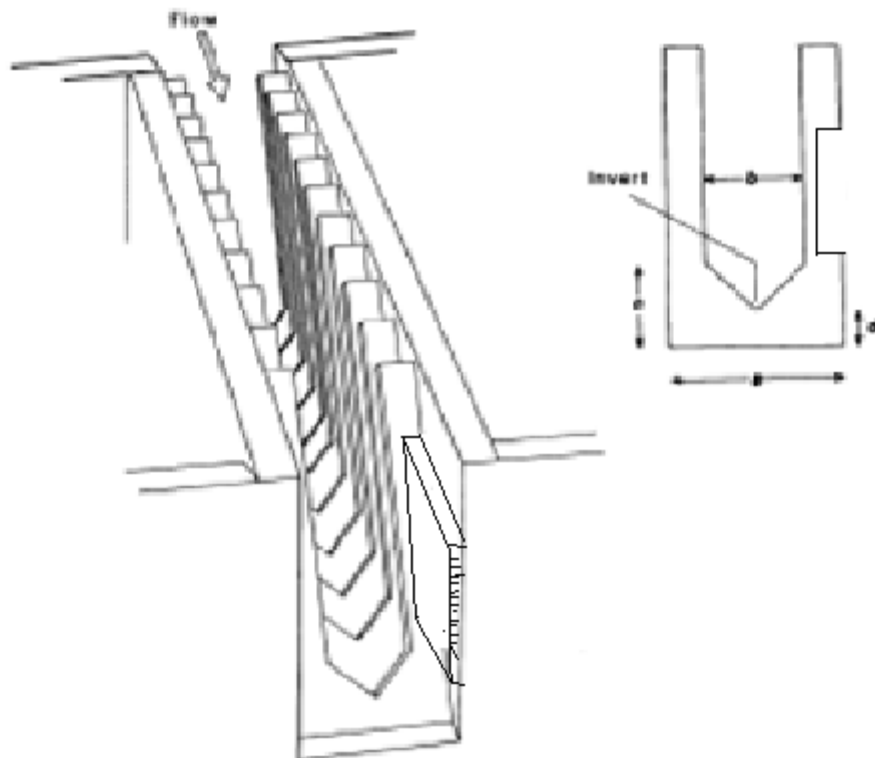


Figure 18 A schematic diagram of a Derid fish pass with single plane baffles. Inset is a diagram of a single baffle with the recommended proportions  $a:b:c:d = 1:0.58:0.47:0.24$ ;  $b$  is the fish free passage width, and the distance between consecutive baffles is  $0.67 \times a$ . (From Lonnberg, 1980.)

### Exerpts from MAFF Fish pass manual



[AFBI advisory sketch 2014] Modify new baffles design with a section cut-out on each side, drawn one side, to accommodate bristle mat fixed along wall ((Board outside, bristles pointing to wall) like the example picture

Use bristle size from Standard elver climbing bristle board could be in two strips: a lower strip for larger eels, upper strip for elvers

Set bristle board top level at 20 cm above operational water height in pass

Baffle material might need to be considered: existing is mahogany, might need to be stronger to accommodate the slot for bristle mat. Baffles could be bridged across the top above water level for strength..

Bristle mat could stop at top of pass where flow levels out. (at downstream end of salmon counter section)