



# THE Tweed FOUNDATION

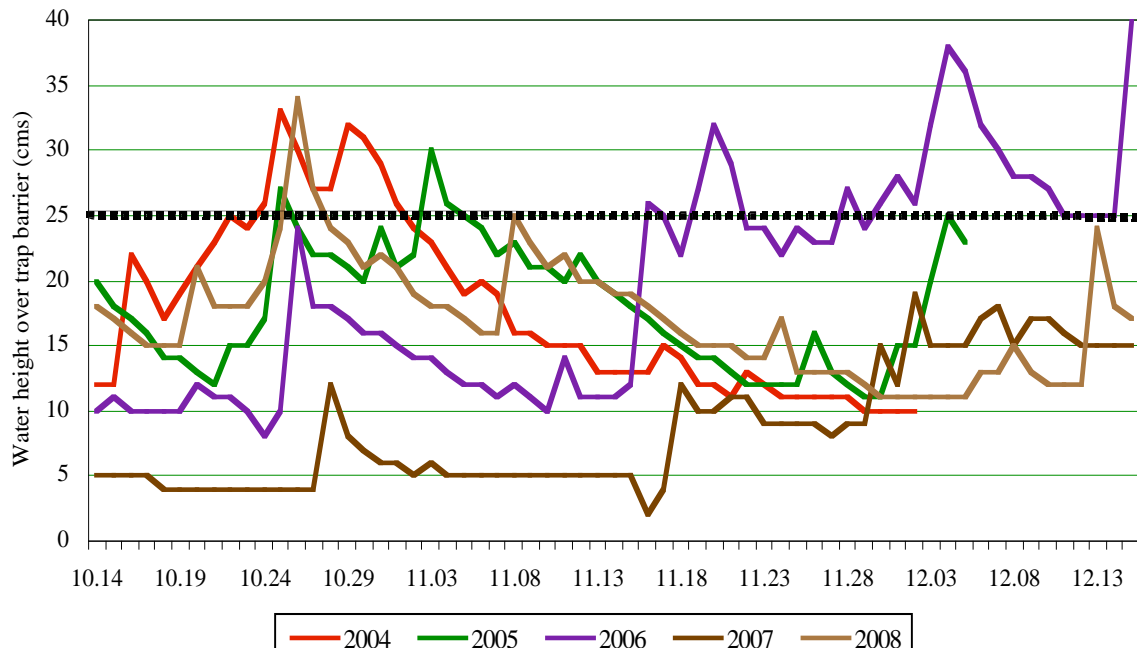
*A Tweed Foundation Paper*

Appendix 2: The relationship between Autumn water flows and the numbers of spawning Sea-trout trapped running up a small tributary of the River Tweed

While it is well known that trout run up even small burns to spawn, the conditions they need and the time they spend upstream are not well documented. This paper looks at the conditions under which adult, spawning, Sea-trout enter the upstream trap on a tributary of the River Tweed near Peebles. This has a catchment area of around 15 km<sup>2</sup>, which is largely hill ground and moor with a maximum altitude of 685m and there is an artificial loch on the stream some 250m upstream of the trap, with a fish-ladder giving access. The adult trout population is bimodal in size distribution, with the smaller Brown-trout being largely male and the larger Sea-trout largely female

The flows at the trap are measured by height over the trap barrier, which is an old bridge-footing weir, and are shown in Graph 2.1

*Graph 2.1 : Daily water heights over the Peebles trap barrier, October to December 2004-08 (there was no water gauge prior to 2004).*



While all the years had a peak in flow in late October, though very variable in size, two (2006 & 07) had an early second peak, in mid November. In the other years, a second peak either came only in late November (2005), in mid December (2008) or did not happen at all (2004). However, 2007 was a very dry Autumn as can be seen from the averages in Table 2.1 and even its peaks did not reach the average flows of other years. In the dry years, few or no Sea-trout reached the trap. It should be particularly noted that in 2004, although the overall average flow was similar to other years, no Sea-trout were trapped. This is because there were no spates at the right time for the fish (the red line on Graph 2.1 is the flow pattern for 2004)

THE TWEED FISH CONSERVANCY CENTRE, DRYGRANGE STEADING, MELROSE, ROXBURGHSHIRE TD6 9DJ  
Tel: EARLSTON (01896) 848271 Fax: EARLSTON (01896) 848277  
email: [info@tweedfoundation.org.uk](mailto:info@tweedfoundation.org.uk)

Charity No. SC011055

A charitable trust established by the River Tweed Commission to promote the development of fish stocks in the Tweed River System

© All information contained within this paper is Copyright and must not be reproduced without the prior permission of The Tweed Foundation. E&OE

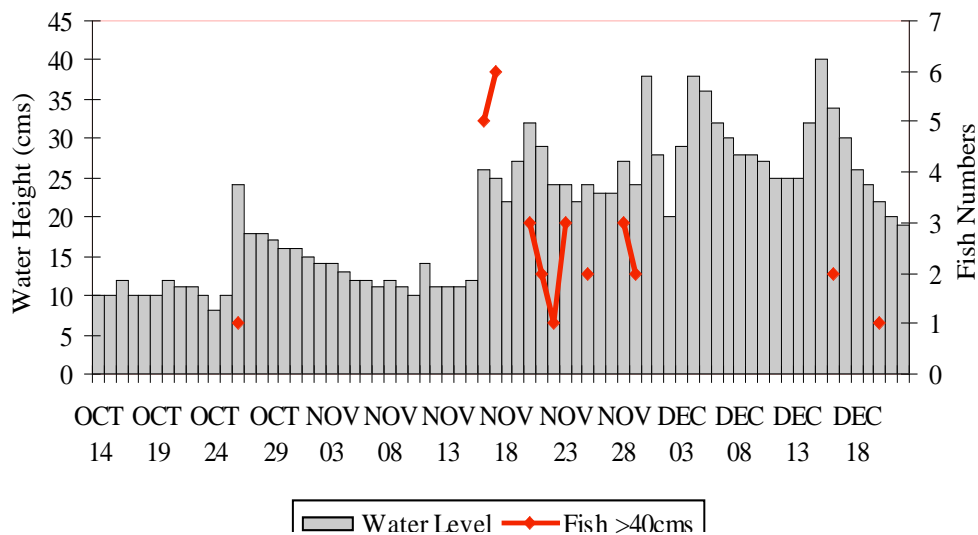
Table 2.1: Average flows and numbers of Sea-trout caught in Autumn 2004-2008.

	Average flows (cms over barrier)	Trout >40cms
2004	17.18	0
2005	18.10	5
2006	19.45	29
2007	8.46	0
2008	17.57	11

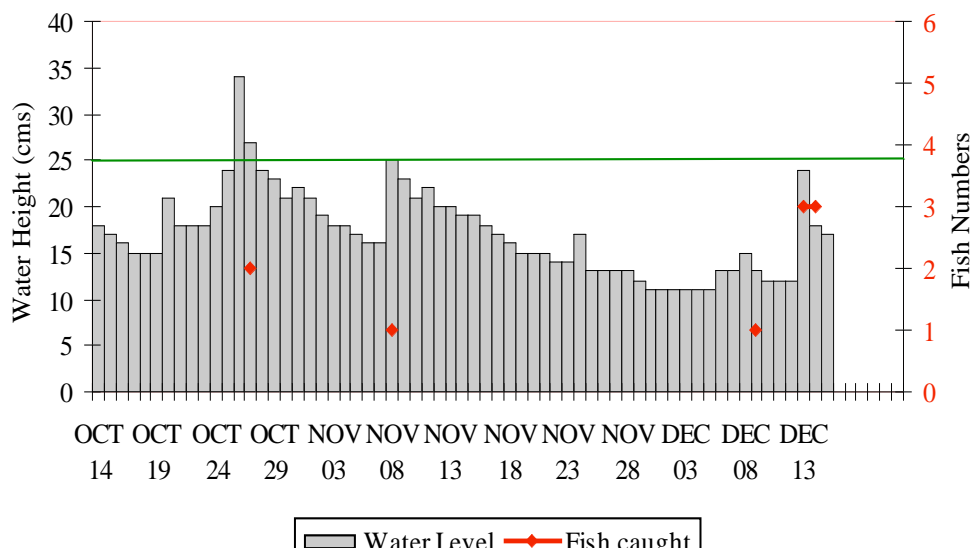
Two examples are shown in Graph 2.2 of plots of water level against numbers of Sea-trout trapped for 2006 and 2008 (the years with most fish) it can be seen that all but two of the fish movements are associated with spates that reached 25cms or more after the 1st of November.

Graph 2.2: Flow heights over the trap barrier and numbers of fish over 400mm in length caught in 2006 & 2008

2006



2008



In 2007, no flows of this level occurred at all, and no fish were trapped and in 2004, no flows reached this level after the 1st of November and no fish were trapped. This shows the joint importance of both water flow and its timing in getting fish up this burn. Not enough flow, or not enough at the right time can both result in no Sea-trout getting up the stream. There will be other factors as well, such as the frequency of appropriate flows in the main river to bring the fish up to the burn mouth, but as far as getting fish into the trap, these must be the main ones. The stream on which the Peebles trap is located is 3-4m wide, so it is of reasonable size with a useful amount of spawning area.

As these results show, the right conditions for Sea-trout to run up burns may not occur in some Autumns, posing the question as to what the effect of Beaver dams would be on a situation like this. Would a Beaver dam and pond downstream of this trap further reduce the opportunities for fish to get upstream by flattening out peaks in flow so that the necessary 25cms levels became even less frequent ? Would delays at the dam itself make the fish miss the flow heights they needed to travel further upstream? Would passage of the dam itself require even higher (and therefore less frequent) flows than 25cms ? Legislation in Scotland requires mill dams & weirs to be watertight. This is so that none of the water that is not used by being diverted into a mill or other factory is wasted for fish movements by being "strained" through a leaky dam, though which fish cannot, of course, penetrate. Water must go over a watertight weir, rather than through it, and water that goes over or round a weir can be used by fish. At Beaver dams, however, water is wasted through the structure so extra large flows are needed to put usable amounts of water over its top or round its sides – and the larger a flow, the less frequent it is.

These sorts of questions have simply not been addressed by those promoting the introduction of Beavers to Scotland, although there are obvious experiments possible, running a trap to give baseline data on what flow levels and dates fish run upstream and then constructing imitation Beaver dams to find out how this pattern was altered. Such work would be much more informative and quantitative – and a lot simpler – than the proposed trial introductions.

A similar situation to this Tweed one has been found on the Girnock Burn, a salmon spawning tributary of the Aberdeenshire Dee, where a trap has been run by the Freshwater Fisheries Laboratory, Faskally, since the 1960's, as summarised in Paragraph 10 of the FAQ's above.

On the basis of these two studies, the conclusion has to be that the addition of extra obstacles (Beaver dams) for Salmon and Sea-trout to get past when migrating up smaller tributaries, where access is already precarious due to very variable levels of Autumn rainfall, will have an adverse effect on fisheries.

Whilst this paper has been prepared by The Tweed Foundation on the basis of information that it believes is accurate, any party seeking to implement or otherwise act on any part or parts of this paper is recommended to obtain specialist advice. The Tweed Foundation does not accept responsibility under any circumstances for the actions or omissions of other parties occasioned by their reading of this paper.