marinescotland
TOPIC SHEET NUMBER 47 V1

Scottish Government
Riaghaltas na h-Alba
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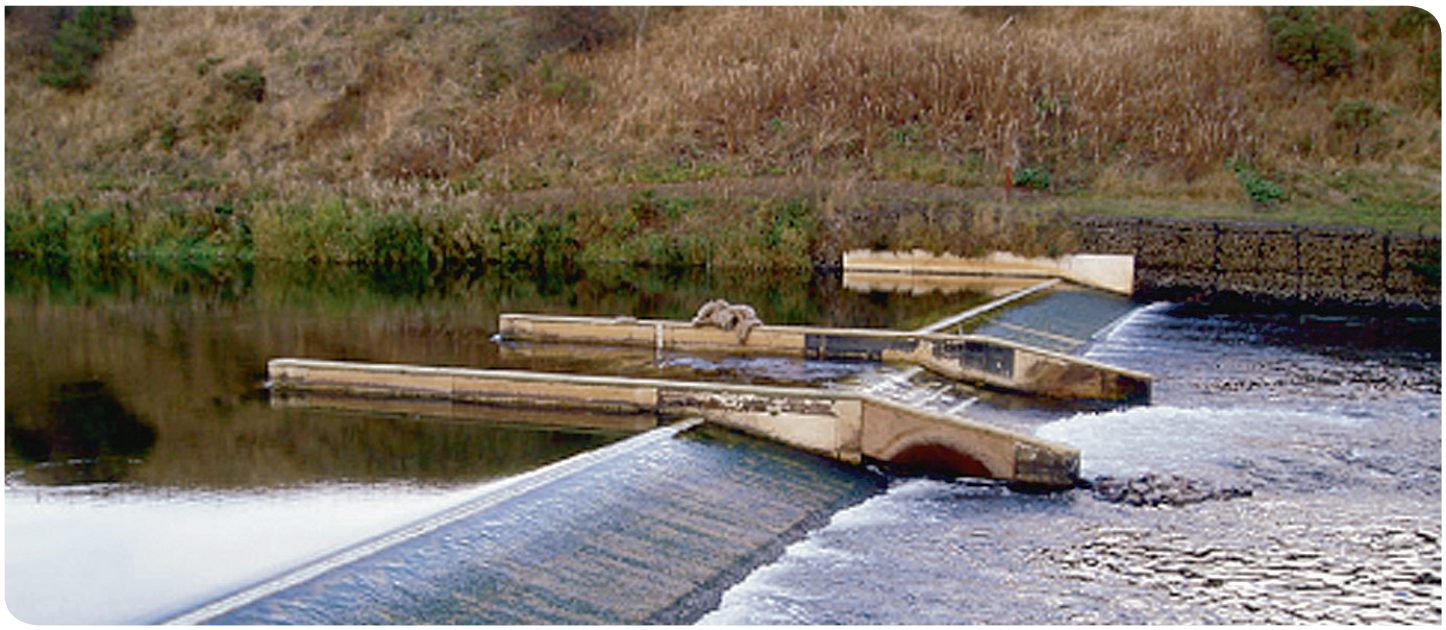
AUTOMATIC SALMON COUNTERS



Background

One of the main tasks of the Marine Scotland (MSS) Science Freshwater Laboratory (formerly Fisheries Research Services) is to estimate the numbers of wild Atlantic salmon (*Salmo salar*) entering Scotland's rivers. The estimates are used to help managers of net and rod fisheries ensure that sufficient fish survive to spawn.

The estimates are currently based on the number of salmon caught by rod anglers and netsmen, though the limitations of the catch data hamper analysis. These problems are compounded by the fact that the fortunes of Scotland's different river stocks and populations can vary so widely.

Marine Scotland Science research

On-going research at the Freshwater Laboratory seeks to determine how much information each of the different types of data contain, and how it might best be combined to produce more accurate assessments. Detailed analysis has already confirmed that the rod catches provide a good indication of the number of salmon returning to large catchments.

Automatic salmon counters are an additional source of potentially informative data. These, however, are prone to a number of problems including false and missed counts. A false count occurs when something other than a salmon, a mat of weed, for example, or string of air bubbles, triggers a count. A missed count which is a failure to record a passing fish can occur, for example, when several salmon pass a counter together. Counters therefore require regular monitoring and maintenance.

Collaborative research

A study, funded by Scottish Natural Heritage (SNH) and carried out by the MSS Freshwater Laboratory and Scottish and Southern Energy plc (SSE), examined the utility of the counter data. There are 29 salmon counters in Scottish rivers. Twenty-five are resistivity counters

that sense the passage of a fish by detecting the change in electrical resistance of the surrounding water. The remaining four are optical counters that detect a fish when it breaks a series of infrared light beams.

Eighteen of the 29 counters provided enough data (at least 10 years) for meaningful analysis. All were resistivity counters. Of these, 12 were correctly sited, well maintained and regularly validated, and were considered by their operator to be providing consistently reliable data.

Data analysis

The trend in the annual count for each of the 12 counters was compared to the trend in the relevant fishery district's annual or spring rod catch. Eleven of the 12 counters had a trend that was broadly in agreement with the trend in the district rod catch as seen, for example, for the Dundreggan counter on the Ness (Fig. 1) and the Pitlochry counter on the Tay (Fig. 2).

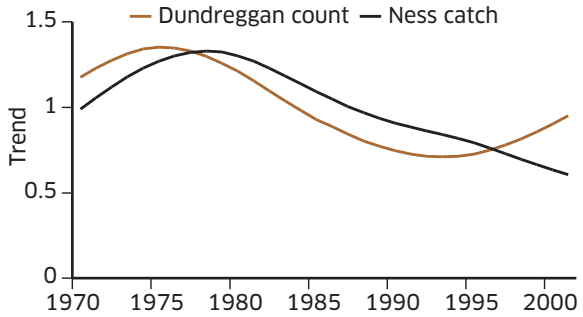


FIGURE 1.
TRENDS IN DUNADREGGAN COUNT AND NESS SPRING ROD CATCH.

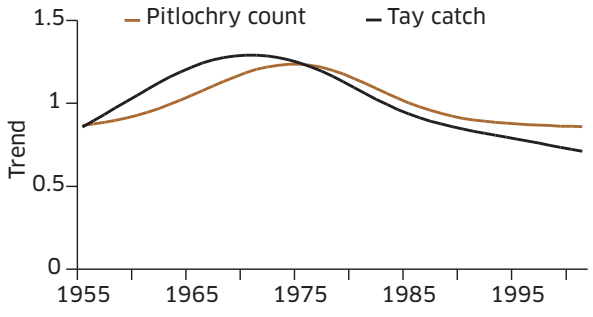


FIGURE 2.
TRENDS IN PITLOCHRY COUNTER AND TAY SPRING ROD CATCH.

The only counter to have a trend strongly opposed to the catch trend was the Clunie counter on the Tay. This discrepancy can probably be explained, at least in part, by an increase in the number of smolts successfully navigating the dam.

Conclusions

The study demonstrates that automatic counters can provide good local information about long-term changes in the abundance of Atlantic salmon. Automatic counters are expensive to install and despite their name require substantial maintenance. Consequently, the use of counters to monitor all of Scotland's salmon populations is impractical.

Nonetheless, counters provide information of a type which is not otherwise available. This information can be incorporated into assessments based on other types of data, such as catches. Progress is being made on building a better framework for the assessment of Scotland's salmon. In view of this, new counters might be sited strategically so as to complement information from other sources.

Summary

- Automatic counters can provide good information about the local abundance of Atlantic salmon.
- Consideration should be given to siting new counters so that they complement the information provided by other sources.

For further information see:

Thorley, J.L. *et al.* Congruence between automatic fish counter data and rod catches of Atlantic salmon (*Salmo salar*) in Scottish rivers. ICES Journal of Marine Science. Submitted.

Trends in Atlantic salmon: The role of automatic fish counter data in their recording. A SNH Natural Heritage Trends Report.