

ROTARY SCREW TRAPS IN SCOTLAND



Introduction

Migrating salmon and sea trout are captured by scientists for various reasons, including measurement of size and age distributions, and for applying identification tags. Trapping of fish is one of a suite of tools, including electro-fishing, the use of electronic counters, and surveying of commercial net catches that together can be used to measure aspects of the biology of salmon which are useful in assessing the status of stocks.

Monitoring Scotland's wild salmon

Assessment of Atlantic salmon (*Salmo salar* L.) stocks in Scotland is one of the main tasks of Marine Scotland Science Freshwater Laboratory (MSS FL). The information obtained is required by the Scottish Government for management of the resource and for the development of policy. The scale of this task is enormous, as there are around 400 salmon rivers in Scotland, and many of these contain more than one discrete

population. Therefore, to provide relevant information, the assessment strategy must ensure both a broad geographic coverage and a consideration of individual salmon populations within catchments. This is one of the key areas where rotary screw traps have recently been used by MSS FL to sample emigrating salmon and trout.

Rotary screw traps (RSTs)

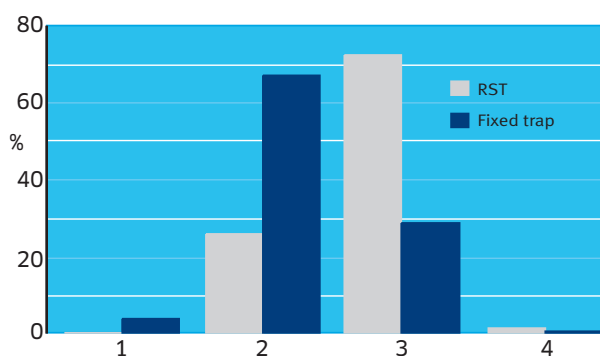
Rotary screw traps (above) comprise a revolving helical central tube mounted on a floating barge. Fish are drawn into the central tube and funnelled into a holding box at the downstream end. This approach, which has been used extensively in Canada, offers a number of advantages over fixed traps, specifically:

- Delicate smolts are captured in excellent condition;
- Traps are inexpensive;

- Traps are relatively easy to transport and as such need not be committed long-term to any one site;
- A range of sizes is available ready made. The traps are typically 4 and 6 ft in diameter;
- When deployed correctly they pose no threat to other aquatic wildlife or rivers users, such as anglers and canoeists.

MSS FL first used an RST in 2000 and since then they have been deployed on a number of catchments. Some examples are described below:

On the River North Esk, RSTs have been deployed on several different tributaries in recent years. The aim has been to describe the biological characteristics (length, age and time of migration) of smolts from each tributary and compare results among tributaries and with the overall river stock characteristics. For example, the age distributions of smolts from the Water of Mark (an upper tributary) and from the river as a whole (sampled from a fixed trap near the head of tide) are shown in the figure below. Water of Mark smolts are predominantly three years old while the overall river production is of two year old smolts.



AGE DISTRIBUTION OF SALMON SMOLTS CAUGHT BY IN A NORTH ESK TRIBUTARY USING A RST, COMPARED WITH THE AGE DISTRIBUTION OF SMOLTS CAUGHT BY A FIXED TRAP ON THE NORTH ESK MAINSTEM.

In 2006, an RST was deployed in the main stem of the River North Esk. The aim was to establish whether or not it could be used in place of the fixed trap. The results are currently being analysed.



INSPECTING THE CATCH ON A TRIBUTARY OF THE RIVER NORTH ESK

In 2005, a RST was deployed in an upper tributary of the River Tay (Errochty Water) to monitor autumn salmon parr movements and assess what proportion of the population would be of suitable size for a possible radio-tagging programme.

In 2006, a RST was successfully deployed in a Wester Ross river to catch emigrating sea trout smolts for tagging and subsequent tracking in sea lochs.

In 2005 and 2006, RSTs were deployed in the Rivers Conon and Shin in collaboration with Simon McKelvey and Iain McMyn of the local Salmon Fishery Boards to investigate return rates and homing behaviour of Atlantic salmon.

Conclusions

- MSS FL experience with the use of RSTs has generally been very favourable;
- The ability to move and deploy RSTs quickly at different locations will be valuable in many studies;
- It is expected that in the future RSTs will play an important role in MSS FL work involving the trapping of juvenile salmon and trout which are moving downstream.

