

Council

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***Gear Trials of a Novel Pelagic Trawl
for Use in Atlantic Salmon (*Salmo salar* L.) Post-Smolt Surveys***

(Tabled by the European Union)

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Introduction

Knowledge of the distribution of post-smolt salmon in both the North Sea and the Norwegian Sea has been built up from a series of survey trawls over the past decade. Smolts have been found to concentrate along the shelf edge and a general temperature/salinity preference has also been identified. Further progress in describing their distribution, and the influencing factors, depends, to a large extent, on the success of future survey trawls. This in itself is problematic using current fishing gear for the following reasons: post-smolt salmon are present in low concentrations relative to other marine fish species in the ocean, survey trials are expensive and this particular survey method is destructive, causing death to the specimens sampled. Therefore the development of survey methods that are both more cost-effective than at present, and less damaging to the post-smolts sampled, is required.

Gear developments have taken place in Norway and this report presents results from a collaborative cruise on the Scottish Fisheries Research Services' (FRS) Fisheries Research Vessel (FRV) *Scotia* involving FRS, the Institute of Marine Research (Norway) and the Atlantic Salmon Trust, which took place in the latter half of May, 2005 to test the new gear.

The main objective of this cruise was to test a prototype trawl which, rather than capturing post-smolts, records, by use of CCTV, their passage as they pass through an open-ended trawl net. A supplementary objective, dependent on the success of the gear trials, was to conduct a post-smolt survey at the shelf edge.

Description and testing of gear

The gear comprised a modified pelagic trawl net with an opening of 60m wide by 10m deep buoyed to ensure surface operation. The cod end was removed and a triangular metal frame, with sides of length approximately 2.6m, 2.25m and 2.25m and a depth of 0.5m, was attached in its place. The frame was fixed and buoyed so that the largest side hung vertically in the water column. To the vertex opposite this side a housing containing a camera was attached. Images from the camera were fed by cable to a transmitting aerial attached to a small catamaran which was towed behind the net. The transmitted signals were received by another aerial mounted on FRV *Scotia* and from there displayed in real time on a VDU located on the bridge of the ship. Successful gear testing took place in calm conditions in the Scalloway Deep off the west of Shetland and in the Minch to the west of the Scottish mainland.

Post-smolt survey

Having completed the gear trials and demonstrating that the trawl could be successfully used, FRV *Scotia* relocated to the shelf edge where a series of 4 operational trawls were conducted. In addition to gathering information on the distribution of post-smolts, CTD and

thermosalinograph information was also collected. In total, 178 post-smolts, one wild adult and one farmed adult salmon were observed.

Discussion

The trial of the modified pelagic trawl gear was a success with real-time footage of fish passing through the net being obtained and recorded. In addition, the supplementary aim of undertaking survey trawls on the shelf edge and collecting ancillary hydrographical information was also achieved.

The successful survey along the shelf edge has shown that the trawl gear is a practical tool for investigating post-smolt distribution at sea. This is extremely relevant to Fisheries Research Services, the Scottish Executive and to NASCO with respect to the SALSEA programme. In summary there are 3 major advantages of the new gear. Firstly, it is much more cost-effective than using normal pelagic trawls with cod ends. The new trawl can be towed for almost unlimited periods and the fish passing through the net can be observed via the camera link, negating the need to shoot and haul the net every hour or so. Thus, a much greater area of sea can be covered, greatly increasing the efficiency of collecting distribution information. Secondly, the new trawl provides a non-destructive way in which to observe the distribution of post-smolts. This is a major breakthrough given the high sea mortality rates currently impacting upon salmon in the sea. Thirdly, it is now possible to link the distribution of individual, or shoals of, post-smolts, much more closely to the prevailing hydrographical conditions as the precise location of each observation can be recorded. This was not the case previously when normal pelagic trawls were used and the location of capture could only be recorded relative to the entire area of the particular trawl.

While the trial was an undoubted success, there are some areas of development that need to be considered further in order to obtain the maximum benefits from the new trawl system. In particular, the conditions under which the gear was deployed were relatively calm (wind force 3 – 4 on the Beaufort Scale) and thus the stability of the trawl requires testing under more testing conditions.