Research on salmon post-smolts north of the Faroes in July 2009

SALSEA-Merge cruise # 2

1 – 15 July 2009

R/V Magnus Heinason OW2252

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INTRODUCTION

The main aim of this survey was to investigate the distribution and stock composition of salmon post-smolts in the areas north of the Faroes and in the Norwegian Sea during the early part of their feeding migration in the open ocean.

The cruise was part of the joint EU project SALSEA-Merge: Advancing understanding of Atlantic Salmon at Sea: Merging Genetics and Ecology to resolve Stock-specific Migration and Distribution patterns. The Faroese cruise is the second in the series, targeting the central Norwegian Sea, in early July 2009.

MATERIAL AND METHODS

The area targeted was west and northwest of the "Vøringplateau" in the central Norwegian Sea. Cruise tracks in the surveyed area are shown in **Fig. 1**. Acoustic data (of plankton) were logged with a hull mounted 38 kHz transducer and recorded on a Simrad EK-500 echo sounder. Biological samples of salmon and other fish were obtained with a salmon trawl designed to be towed at the surface mounted with a live-fish box mounted in the cod-end. To sample small zooplankton a WP2 plankton net was used, and on a krill trawl was used to sample larger zooplankton.

All species caught were sampled according to a predefined sampling protocol, and all samples were labelled individually. The salmon post-smolts were photographed, measured, weighted, sexed, scale loss was estimated, number of lice counted and stored, and visual inspection of cataracts, external tags, finclip for internal tags, deteriorated fins/escapee, scars etc. Further the following samples and recordings were taken (and stored if applicable) on every fish: scale sample, pectoral fin for DNA sample, disease sample (gill filament, pyloric caeca, spleen, kidney on three places), ISA disease sample (gill filament and kidney), Isotope sample (liver, dorsal muscle, adipose fin, heart, tip of caudal fin), stomach sample, and otolith sample. The carcass was labelled and stored.

Other species like mackerel and herring were measured, weighted, sexed, otoliths were removed for age reading, and the stomach was removed for dietary analysis of the first 10-20 fish sampled for each species.

Hydrographic data (temperature, depth, and conductivity/salinity) were collected every evening with a CTD cast down to 1000 m depth. Water samples were taken from each station, with water bottles mounted on the CTD for calibration of the CTD. Samples (fluorescence) for chlorophyll analysis were collected from the upper 100m.

RESULTS

The weather was excellent and the survey coverage was according to the survey plans. Altogether 33 salmon trawl hauls were taken, 8 WP2 plankton net stations, 1 krill trawl station, and 8 CTD stations. The travelled distance was about 1500 nautical miles.

Salmon were caught in every haul in the northern area (**Fig. 1**). In total 325 salmon, on average 7.3 salmon per tow with low spread from haul to haul. Most of the salmon was post-smolts that have migrated out from the rivers in the spring 2009, mean length 21 cm and 106 g (**Fig. 2**), but 15 larger salmon were also caught, 14 1SW (mean length 49 cm) and one 2SW (66 cm) fish.

Eight post-smolts were finclipped when caught and these were subsequently scanned for presence of a microtag (CWT), and three of them showed sign of being tagged (they were beeping in the test). The tags will be removed and identified at a later stage.

One of the subtasks was to collect scales from the side of the post-smolts to identify the river- and sea-age of the fish, as well as to calculate the growth of the fish by measuring the circuli spacing in the growth zones on the scales as a measure of growth. Therefore a live fish box was used to get the fish trapped in a container in the cod-end instead of being contained in a ordinary cod-end, where the fish might lose its scales due to abrasion against the netting in the cod-end while being washed around. A further benefit by using a live fish box is that the task to estimate the sea lice infestation is likely to be less biased because the lice are not lost due the abrasion against the netting during towing.

The highest catches of salmon were in areas with SST between 10-11 degrees (**Fig. 3**), and none were caught outside the 9.5-12 degrees range. Last year the highest catch rates were in the range 9-10 degrees, i.e. one degree lower than in 2009.

The sea-surface temperature (SST °C) along the cruise tracks is shown in **Fig. 4**.

ACKNOWLEDGEMENTS

The crew and scientific personnel are thanked for their effort during the cruise. The cruise was the second cruise in 2009 under the EU FP7 project “SALSEA-Merge”. The cruise was co-sponsored by the “TOTAL foundation” from France, and the grants were greatly appreciated.

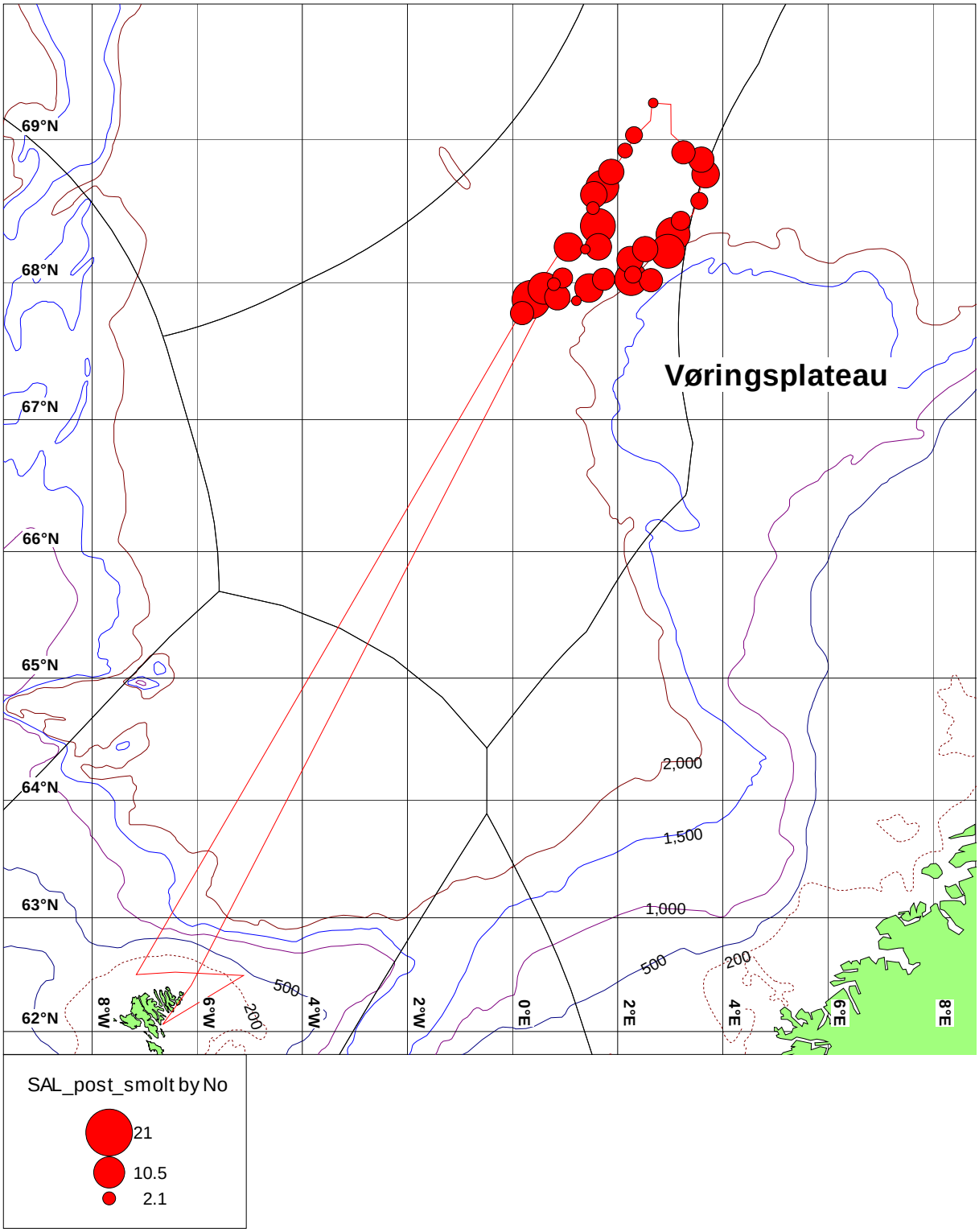

Figure 1. Cruise tracks (red lines) and number of salmon caught in the Norwegian Sea with R/V *Magnus Heinason* on the SALSEA-Merge salmon cruise # 2 in July 2009 (cruise no. 0956 1-15/7 2009). The total number caught was 325 salmon in 33 trawls hauls, of which 310 were post-smolts.

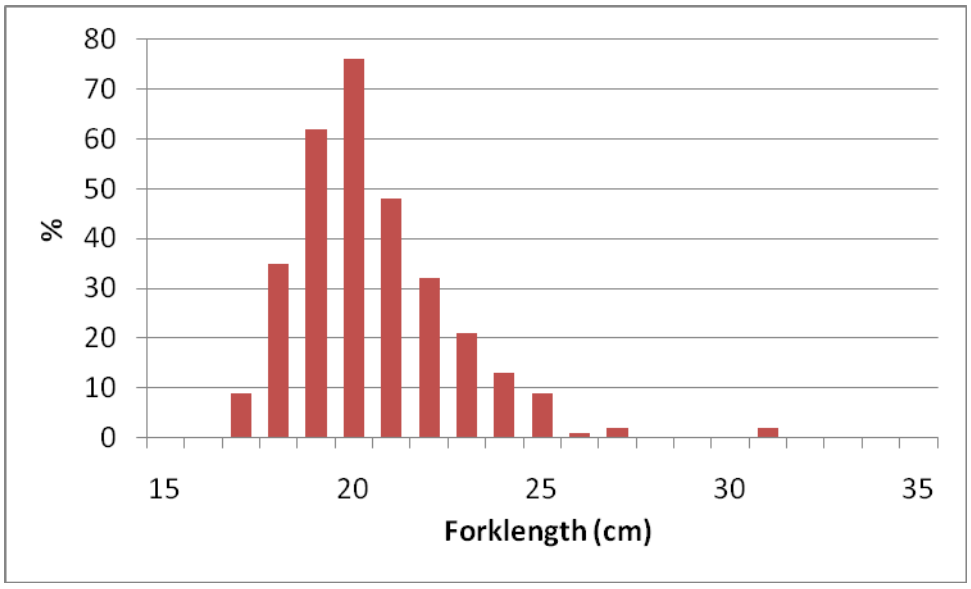

Figure 2. Length distribution of salmon post-smolts caught, R/V *Magnus Heinason* cruise 0956, 1-15/7 2009.

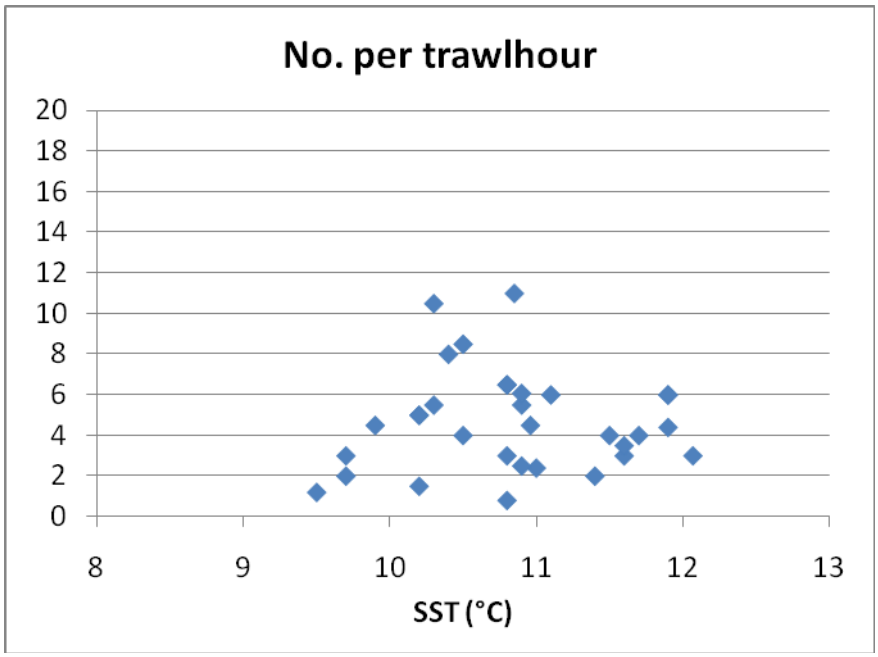

Figure 3. Number of salmon caught by trawl hour (on average 7.3 per haul) in relation to sea-surface temperature (°C), R/V *Magnus Heinason* cruise 0956, 1-15/7 2009.

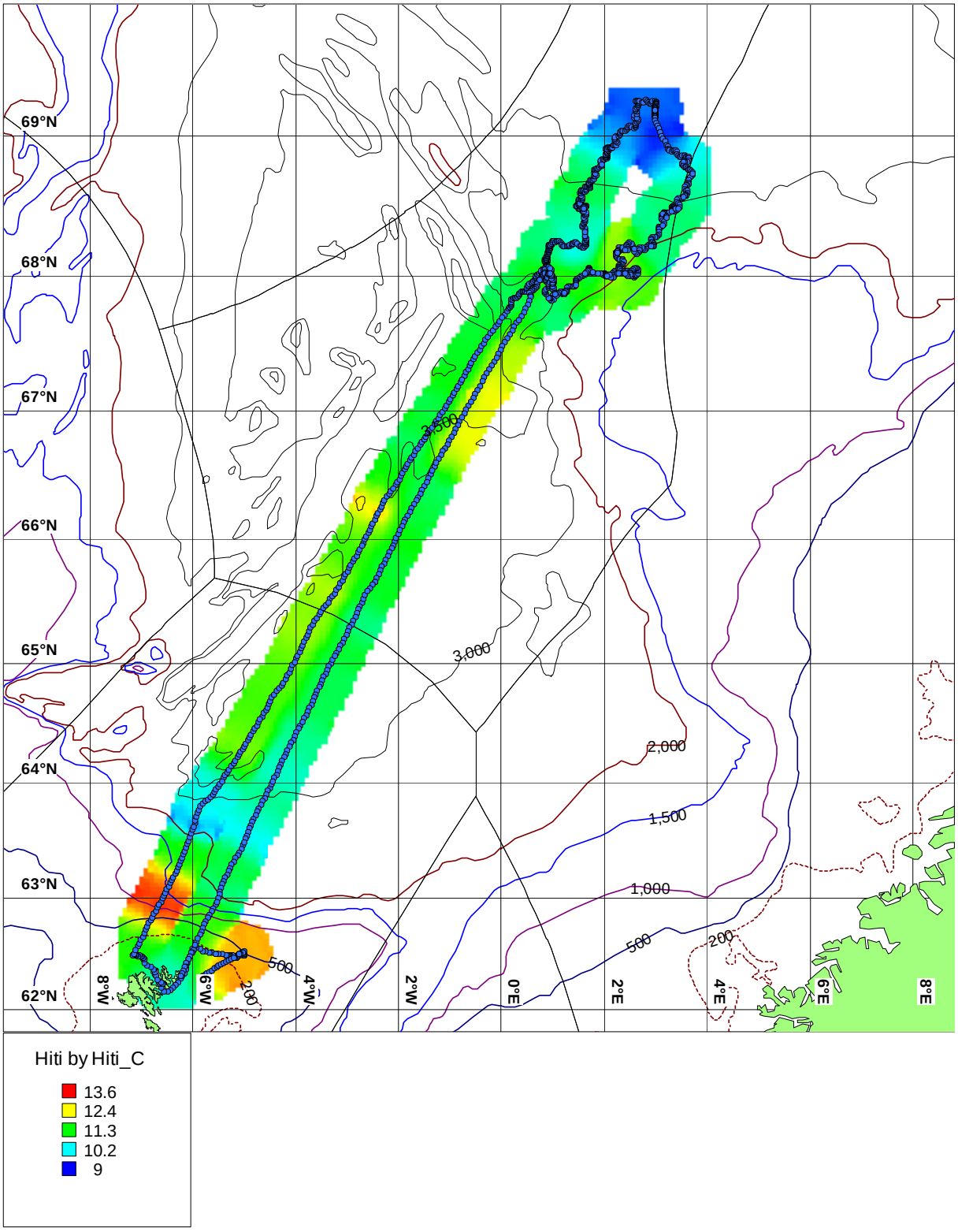

Figure 4. The sea surface temperature (SST °C) along the cruise tracks, *Magnus Heinason* cruise 0956, 1-15/7 2009.