



The influence of growth on Atlantic salmon related to exposure to salmon lice, with and without SubEx medium

Ine Rysjedal, Hedda Wahl-Ovesen, Markus Trohjell, Ranja Ræstad, Snorre Valland Aarseth



CONTEXT

Atlantic salmon act as a host and vector for parasites such as salmon lice, a parasite also shown to negatively affect the wild salmonid populations.

In this study, $n = 29,817$ tagged Atlantic salmon were studied at four different releases. Half of which were given the prophylactic treatment SubEX, against lice, in advance of the release, and the other half were used as a control group. After 1-4 years at sea, $n = 559$ the Atlantic salmon returned to the river. They had experienced highly variable lice infestation pressure, which were linked to survival and growth.

MATERIAL AND METHODS

The study was done in the River Etne, in the Hardangerfjord

The experiment was first carried out in 2013 and then repeated in 2014. The two groups of Atlantic salmon were released in River Etne, and was then caught when returning to the same river, after their 1-4 years at sea

The average values of the weight were calculated from all individuals before the release and after the collection

Table 1: Summary of the released salmon smolts and sample sizes for the treated salmon (SubEX) and the control groups in the four different trails. Fish weights in gram +/- SD (standard deviation).

| Year | Release date | Treatment | Control | Weight (g) |
|------|--------------|-----------|---------|------------|
| 2013 | 18 May | 3 791 | 3 972 | 72 ± 21 |
| 2013 | 9 June | 3 801 | 3 868 | 74 ± 16 |
| 2014 | 18 May | 3 819 | 3 818 | 47 ± 11 |
| 2014 | 9 June | 3 770 | 2 978 | 42 ± 10 |

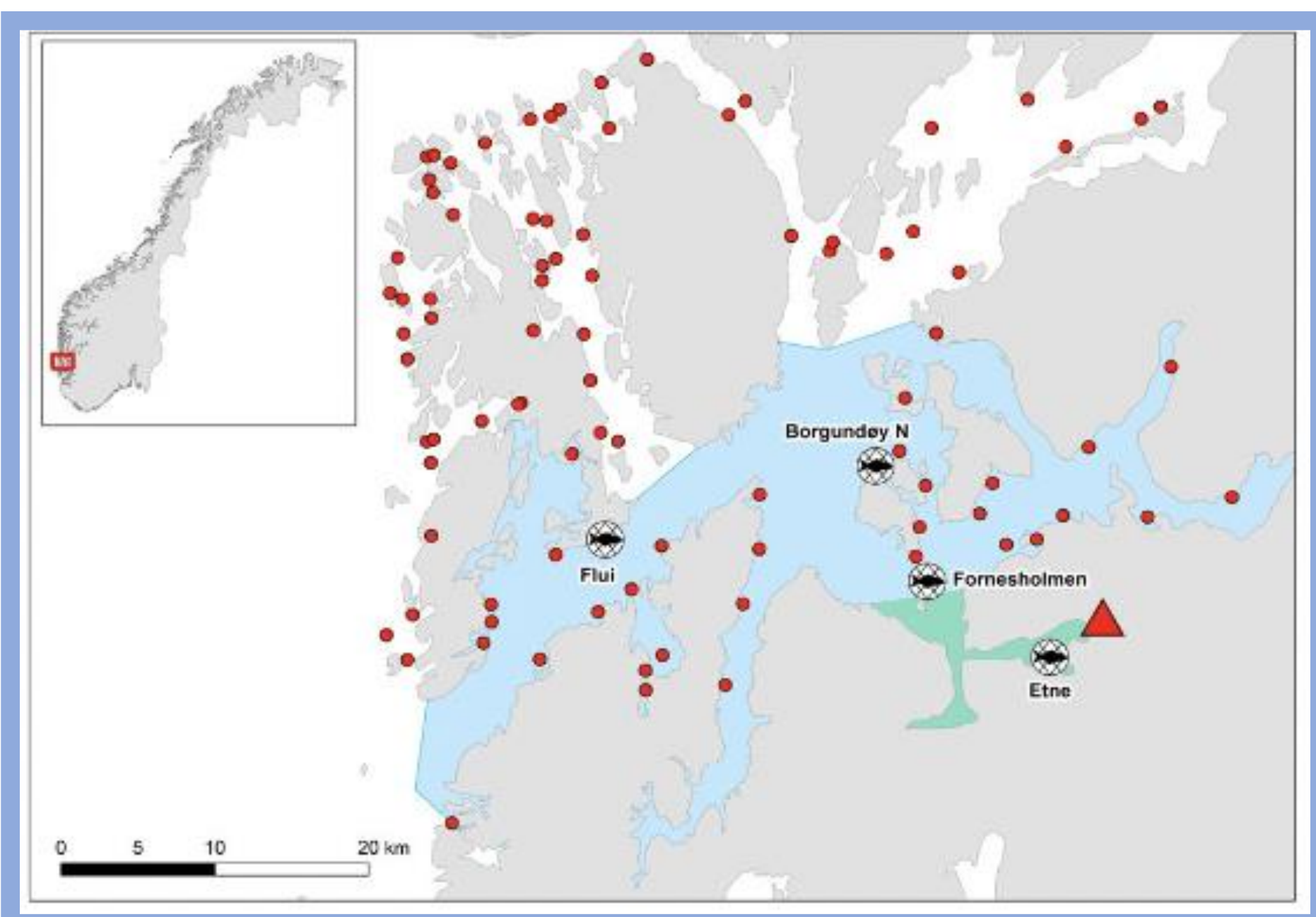


Figure 1: The study area, the Hardangerfjord, where River Etne is marked with a red triangle.

STUDY AREA

The study was done in River Etne, in the Hardangerfjord. The Hardangerfjord in Hordaland County in Western Norway is one of the most extensively used areas on the Norwegian coast for salmon production, with a stock of farmed Atlantic salmon of about 80,000 and 95,000 metric tonnes in 2013 and 2014 respectively.

RESULTS

The average mean weight for the treated fish is 4217 grams.

The average mean weight for the untreated fish is 4717 grams.

For the individuals returned the average is 70,5 for the treated fish, and 60,25 for the untreated fish.

Table 2: The mean weight (grams) in the different fish-groups, and the number of individuals of every group returning to Etne river

| Group | Mean weight(g) | No.individuals | Mean weight(g) | No.individuals |
|-----------|----------------|----------------|----------------|----------------|
| | Treated groups | returned | Untreated | returned |
| May 2013 | 4171 | 36 | 4326 | 70 |
| June 2013 | 4124 | 93 | 3933 | 90 |
| May 2014 | 4425 | 90 | 4877 | 80 |
| June 2014 | 4149 | 63 | 5720 | 1 |

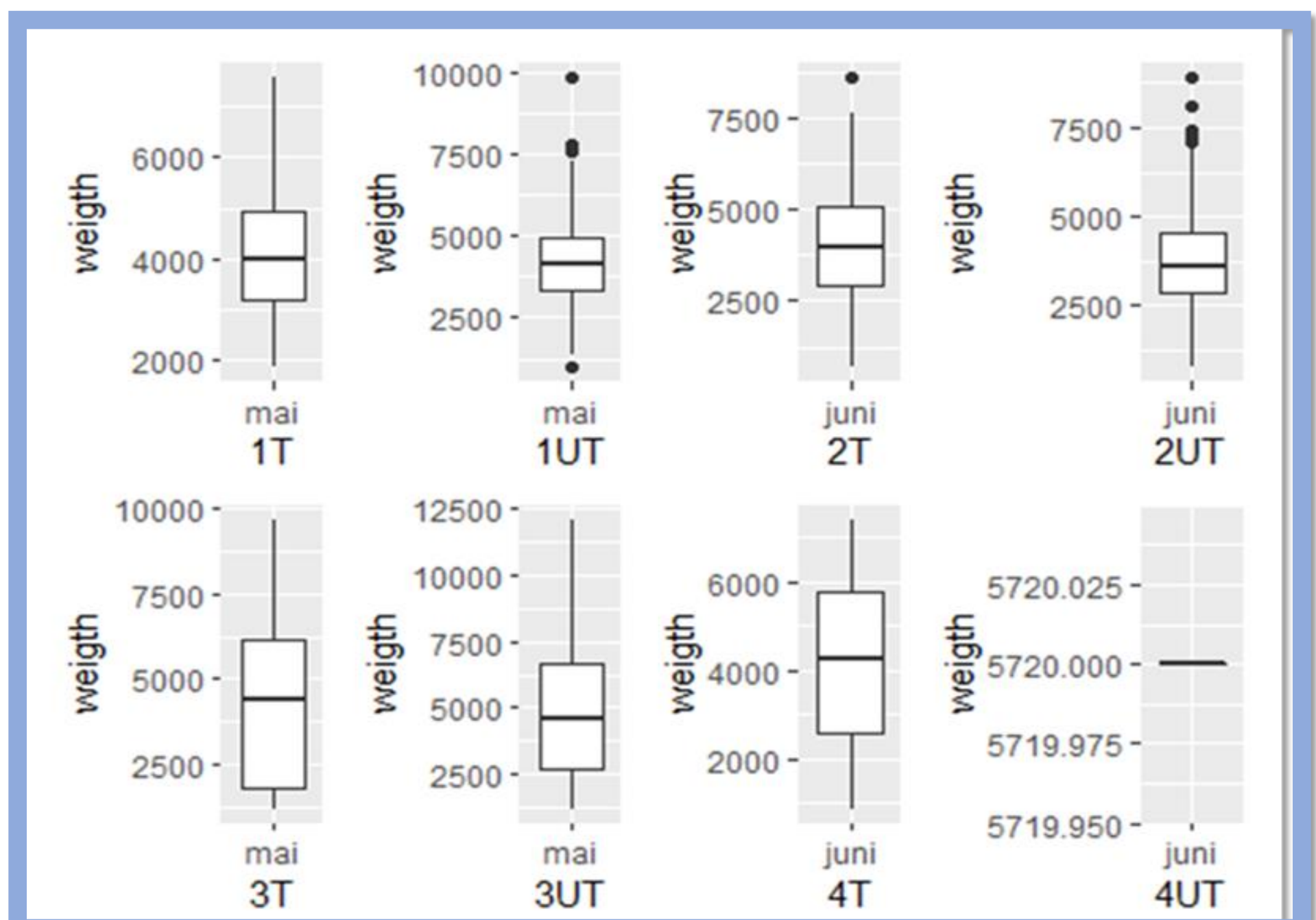


Figure 2: Boxplot of the weight (grams) to each of the returning groups (1T-4UT) of Atlantic Salmon to Etne river in Hardangerfjorden. Treated groups are abbreviated with T and untreated with UT. Group 1-2 are from 2013 and 2-3 are from 2014.

DISCUSSION AND CONCLUSION

No effect of the treatment on the weight of the returning fish. However this does not prove that the infection of salmon lice is not related to growth in the aquaculture industry

Despite the lice not impacting the growth of the Atlantic salmon in this study, another interesting observation related to the returning fish was made. Treated smolts released in June, were about 500g lighter for each year they had stayed in the sea, compared to treated fish released in the same year in May. This pattern was consistent for both genders.

Although some of the weight difference can be caused by the longer period (of 3 weeks) spent in the sea for the group released in May compared to June, this result may also have been caused by lice.

