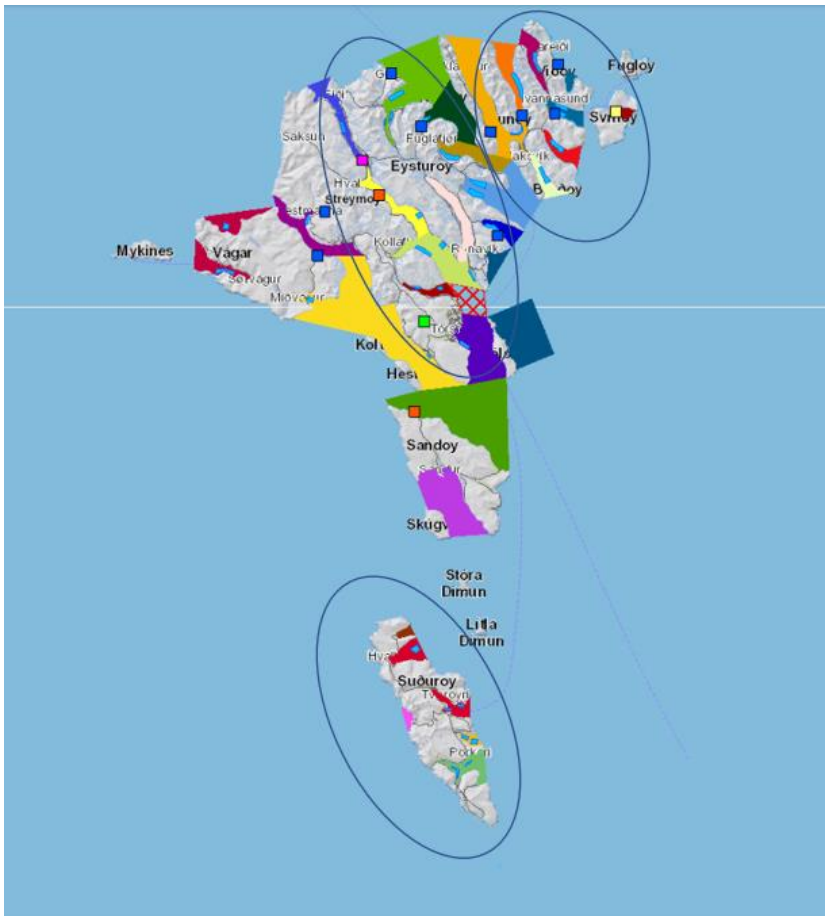
Integrated pest management for the control of sea lice.

Sea lice are horizontally transmitted between hosts and an area management program is central in preventing the potential spread of lice from farm to farm. A good preventive plan requires an understanding of life cycle of the parasite and a thorough knowledge of farming areas.

The companies farming areas are divided into regions and farming fjords. Coordination of area management strategy is divided between two farming managers, coordinating respectively the north region and the west/southern regions. Each region has over the years developed best practice with regards to stocking strategy, preventive measures and treatment strategy to consistently reduce internal and external lice infestations pressure, and thereby ensuring low overall lice numbers.



The treatment and preventive strategy in order to control sea lice at our farming sites has its foundation in area management of the regions. As a means to avoid and reduced treatments to the lowest possible number, stocking of sites is carefully considered. As far as possible, farming site know to transmit lice between areas are stocked at the same time, thereby coordinating the production cycle. Faroese farming legislations also appoints that farming sites in the same

farmingfjord, must conduct a strict area management of the sites, with coordinating stocking and farming operations.

Shortening of the production time at sea is the most important measure to reduce lice numbers. Producing larger smolts has been a major aiming point in the company's investment programme. In the coming years the smolt size will increase gradually, resulting in shortening of the production time at sea. This will result in a more frequent breakage in the sealice lifecycle, which is dependent on live hosts to reproduce. Treatment and preventive strategy should be easier under these conditions and this will also give some possibilities to reconstruct the area management strategy.

Treatments against salmon lice are consist mainly of non-medical treatments methods, using thermal treatments and using the FLS flushing system. These systems are installed onboard the companies farming supply vessels for mechanical delousing, with specialized crew who are focused on refining their skills in mechanical treatments. Although good results are seen with these methods, welfare challenges associated with these methods are a concern, and it is therefore important to carefully address these handling and welfare challenges. Skilled staff and reducing treatments are most important actions to alleviate negative impact of treatments.

Medical treatments against salmon lice been reduced gradually over the past years, and is now at a very low level. Medical treatments are preserved to difficult cases, and is used when this is the best option with regards to animal welfare or when indicated in an overall treatment strategy. When used, medical treatments are always used in rotation with other treatments options or preventive measures, to reduce the risk of sealice developing resistance towards active ingredients.

Lice numbers are consistently being monitored on all farming sites. Every 14th day an independent third-party institution (Fiskaaling – Aquaculture Research Station) are counting lice on all farming sites. Lice counting results are publicly available. Constant monitoring and obtaining a reliable overview of the lice situation on our farming sites is a basic necessity to manage a good treatment strategy.

The total sea lice load from our production is continuously being monitored throughout the year, and has been on a descending trend in the last few years. The total sea lice load is currently at a very low level compared with historical data. The total lice load is calculated as product of average sealice load multiplied with the number of fish in the production. In the ABM plan the maximum total allowed load for each area is based on the regulatory lice legislation in place, currently the lice limits are set to be 0,5 mature female sea lice through the periode May, June and July, and 1,0 mature sea lice through the rest of the year. Although the maximum limits are compulsory limits for each area, the strategic lice load number set for each area in the production planning, is generally lower and is set specific for each area, based on the historic development of the lice situation.

The maximum sea lice load for each area, is also revised in according to impact on the stock of wild salmonids. There are no wild natural spawning salmon stock in the Faroe Islands, but the wild sea trout population could be affected by total sea lice load from the salmon aquaculture activity in the Faroe Islands. The Faroese aquaculture association has assigned a project to investigate the impact aquaculture production could have on the wild sea trout population. The preliminary results of this project shows that this is an complex ecosystem, but with more data collecting and analysis, it

should be possible to get a informed basis of the health status of the wild sea trout population in the Faroe Islands, and if the salmon aquaculture has an impact on condition of the wild sea trout population. These results together with the overall review of salmon lice strategy for each area, will form the basis of adjustment of the total sea lice load in an ABM scheme. Documentation of this, will be included in the sea lice section in the veterinary health plan for each area.

Cleaner fish is used as a preventive measure to control salmon lice. Cleaner fish have a continuous preventive effect, delaying increase in lice numbers, and reducing number of treatments. Some sites have used cleanerfish exclusively, were no other treatments methods have been necessary through the whole productioncycle. Lumpfish is the only species used as cleaner fish in the Faroe Islands. The biology of the lumpfish is quite different from the salmon, and it can be challenging to adapt the cage environment to optimize thrive of this species. There is a continuous progress in learning which feed and environment is the best for the lumpfish, to secure the welfare of this species in the salmon cage environment. The cleaner fish strategy is continuously reviewed, to optimize the efficacy of their lice reducing effect.

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