

RURAL ECONOMY AND CONNECTIVITY COMMITTEE

SALMON FARMING IN SCOTLAND

SUBMISSION FROM SARA NASON (Member of Sea Change Wester Ross)

Wester Ross is one of only two MPAs with protection from dredgers and one of a handful of MPAs designated for maerl. Out of this handful of MPAs, Wester Ross is one of the MPAs with the most abundant maerl beds. This is of European and international significance. The MPA is not fully mapped and therefore there are likely to be maerl beds which are currently unknown. Wester Ross is also one of the few MPAs with a real chance of recovery due to the umbrella effect giving protection to a broader range of species than those with conservation status the MPA was designated to protect. This has great socio-economic impact on a wide range of fisheries, as well as to some extent attracting scientists and recreational divers. Maerl has 'recover' conservation status.

Wester Ross is *highly significant* within the whole MPA network.

If the Government can allow time for MPAs to recover species and habitats of conservation importance - which are of importance because they support high levels of biodiversity and are nursery grounds for fisheries which in turn has economic benefit - then fisheries are more able to recover which can only improve the economy.

Wester Ross MPA already has 7 or 8 active Salmon Farms (and sites not currently in use) It also has many more farms within a few kilometers of the borders so the cumulative impacts are important and knowing what the ecosystem can absorb is also of vital importance. We are already fishing the bottom of the food chain with no fin-fish fisheries left and just prawns, crabs, lobsters and scallops. There is a real chance to build on these sustainable fisheries but this chance could be thrown away by the policy of doubling salmon farms.

We know from the the ECCLR Enquiry that autoDEPOMOD is flawed when assessing gross organic pollution outside of the Allowable Zone of Effect. We also know maerl is highly sensitive to smothering. Emamectin would also be a problem in sufficient concentrations. More recent modeling shows that gross deposition can **take place 3 or 4 km away from the farm** and with knowledge of the long life of these chemicals and their impacts this is of great concern to creel and dive fisheries but also to maerl beds. Only hydrodynamic modeling of cumulative impacts is a sufficient **model of rough impacts** when there are many salmon farms in the area.

With reference to maerl beds it is clear that Sepa has not take account of their own research when it comes to maerl because it would suggest that Wester Ross MPA would be ruled out for more salmon farms. More farms puts the MPAs recovery -

and the potential for an alternative rural economy at risk. The best report on the impacts of salmon farms which is the basis upon which this statement is made is the - **Investigation into the impact of marine fish farm deposition on maerl beds** Commissioned Report No. 213 (2006) (Research commissioned by SNH, SEPA and MARINE HARVEST)

Key findings which I quote in italics from the research paper are:

“Apart from harbouring high biodiversity, it has been shown that the protection of Scottish maerl beds can benefit commercial fisheries. This is because Scottish maerl grounds harbour high densities of broodstock bivalves (Hauton et al., 2003; Hall-Spencer et al., 2003) and act as nursery areas for the juvenile stages of commercial species such as cod (Gadus morhua), crabs (Cancer pagurus) and scallops (Aequipecten opercularis), which are attracted to the complex three-dimensional structure (Kamenos et al., 2003, 2004a,b,c).”

“Experimental evidence from laboratory studies has, however, shown that maerl is particularly sensitive to siltation and lowered oxygen levels (Wilson et al., 2004). “ and “(Wilson et al., 2004). The laboratory experiments undertaken by Wilson et al. (2004) demonstrated that maerl was affected by siltation of fine sediments due to the reduction of water movement around the thalli which probably limits gaseous exchange with detrimental effects on the algae. The deposition of organic particulates around the fish farms therefore probably affected the maerl through this mechanism rather than through reducing the availability of light.”

We do not know how far from salmon farm cages gross organic enrichment will impact maerl beds because in the report it was recorded up to 100m away from the cage edges only. This is not the same as saying the impact ends at 100m. **The study was not designed to assess impact beyond 100m. So it is unknown if it extends beyond this as the research did not measure it.**

To quote the report, *“ It should be noted that these distances represent the outer survey points on those transects and therefore it is likely that the footprint extends beyond this distance”.*

The report states that DEPOMOD is an unsuitable model to use when maerl beds are present. In other words it should not be used in Wester Ross MPA, yet as far as we know it is the only model which has been used and still is.

The report goes on to say, *“The results suggest that in order to use DEPOMOD for predicting effects of fish farms near maerl sites, DEPOMOD would need to be specifically validated for maerl substrata. “ This discrepancy between the predicted and observed effects of fish farm deposition in conditions of strong tidal conditions highlights potential errors in the modelling used to license fish farms in areas of*

strong tidal flows.” On page 43 of the report it also says “The DEPOMOD model has been validated using a particulate tracer study on silty mud in sheltered sea loch conditions, which is typical under most Scottish fish farms (Cromey et al., 2002b). However, it has not been validated for maerl substrata and the near bed current speeds at the three sites in this study fall outside the range for which DEPOMOD has been validated.” and “Because this study has found that DEPOMOD underestimated the effects of deposition outside the conditions for which it was validated, consideration should be given to restricting its use to environmental conditions in which it has been validated.”

Further quotes go on to say, *“The limitations of numerical models at predicting the seabed effects in locations with strong tidal streams have already been acknowledged by SEPA (2004). SEPA have recognised that numerical models, such as AUTODEPOMOD (V2), may underestimate impacts at well-flushed sites and that because these models have been designed for soft sediment environments, **they are not suitable for uncritical application to maerl beds.** “*

“The matrix-like structure of maerl beds is likely to also contribute to material accumulating at rates in excess of those predicted by DEPOMOD. Divers observed that the intricate matrix of interlocking maerl thalli, stones and shells was able to trap organic wastes from the fish farms. This means that particles which have been deposited on the seabed are less likely to re-suspend compared to particles deposited on a soft sediment seabed.”

SEPA uses self regulation and grab sampling. The study comments on this with regards to maerl, *“ the use of diving has considerably enhanced the results of this study compared to remote survey techniques such as grab sampling. By having divers on the seabed, the visual appearance of the seabed and features such as presence of *Beggiatoa* and epifaunal could be accurately noted.”*

The report also confirms what the SAMS report to the ECCLR committee noted, that there is a high correlation between sites for maerl and sites suitable for salmon farms. However this study only looks at research into the sensitivity of maerl to sediment / gross organic enrichment, it does not examine dissolved nutrients or chemicals. We do not know the impact of these but we know there will be impacts on a wide and diverse range of species that live on maerl beds and maerl beds do not easily recover. The fact that salmon farms and maerl beds tend to gravitate to the same areas was known in 2006 (12 years ago). Yet this report seems to have been ignored when monitoring existing farms and even allowing salmon farms to get to scoping stage. Clarity is important both for the industry and those impacted by it. The Scottish Government needs to urgently amend national marine planning guidance, so there is a presumption against any future salmon farming developments inside Marine Protected Area.

Equally extra nutrients from salmon farms are not only likely to impact sea grass which support fisheries but also adds to the possibility of algae blooms which impact shellfish. **I believe it is safe to say that there is no research that indicates what the safe distance from maerl that a salmon farm can be. Nor is the model sufficient in an area where there are many salmon farms. So the precautionary principle must apply. Maerl has recover status and as this report says** *“The impact on the health of the maerl thalli is of significance because maerl is very slow growing (it grows circa 1mm per year forming seabed deposits that take 1000s of years to accumulate (Blake & Maggs, 2003)) and therefore has a very limited capacity to recover from damage caused by fish farm deposition. Hence the effects of deposition on maerl are very long-term. “*

Recently Winter Spawning Herring was recently found just south of the MPA probably targeting maerl beds. This was a vast 2km x 1km spawning ground for Winter Spawning Herring was found just south of the MPA in the Wester Ross economic zone near Gairloch - herring is an important fishery for recovery. Herring could - if allowed to recover - become one of Scotland's key fisheries again. There are other spawning and nursery grounds in inshore waters and we do not know how these are impacted. Species in a food chain are all interconnected, and herring and maerl are keystone species in Wester Ross and they need to be protected in order to support the wider ecosystems and most importantly support *improved* fisheries.

There is nowhere in Wester Ross MPA which is 3-4km from a maerl bed that I know of and there should be no more salmon farms added to the MPA.

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