

To New Salmon Farm Advisory Panel for Hearing on 8 May 2017

Supplementary Statement from Kenepuru and Central Sounds Residents' Association (KCSRA)

In Support of Submission dated 26 March 2017

From Hanneke Kroon

Disease and Disease risk

LOCATION ISSUES

The publicly available scientific evidence demonstrates that the Marlborough Sounds environment does not consistently provide the optimal environmental conditions for growing king salmon for long periods. Most importantly, the seawater temperature should be between 12 and 17 °C, while 15 °C is the optimum growing temperature for king salmon¹.

The depth should be over 40 meters. Except for the main navigation channels, the Central Marlborough Sounds is too shallow, with a depth of 30 meters in the centre of the bays.

High current areas for proposed new sites are being advocated, as it disperses the salmon farm waste over a large area and allows much higher stocking densities.

However, it is a myth that the water is cooler when the current is faster (high Fflow).

These conditions increase, we submit, the disease risk both to farmed fish and thus transference or "blowback" to wild fish species.

Further, in the Marlborough Sounds the two high current channels are we believe, too precious ecologically and also act as the main navigation routes in and out of the Sounds.

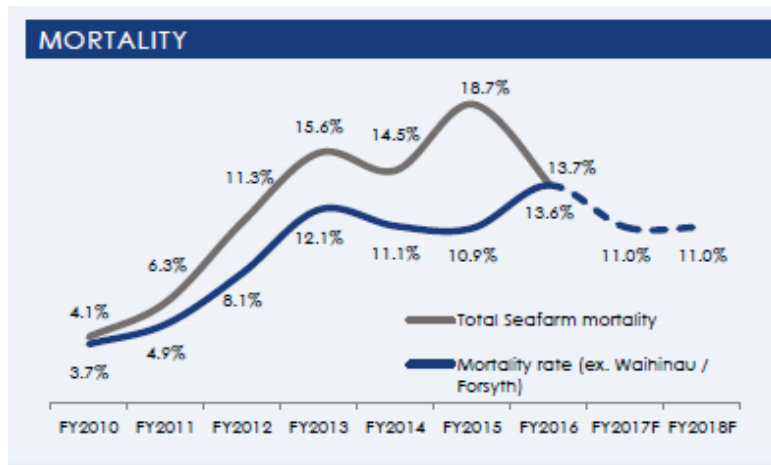
Finally, according to International Best Practice for salmon farming, salmon farms should not be sited in areas subject to algal blooms nor in marine habitat for endangered species, such as the King Shag, nor in areas in high demand for other public uses.

DISEASE AND MORTALITY

Fish disease risk assessment is one of the reports commissioned for MPI and the Adverse Environmental Effects section, written by Dr. Diggles. In essence Dr Diggles has merely updated his 2012 report, written for NZKS and used at the Board of Inquiry. At that time the contention was that NZ benefited from an absence of any known salmon pathogens.

¹ Comparison of the international regulations and best management practices for marine finfish farming
Carina Sim-Smith and Andrew Forsythe, National Institute of Water & Atmospheric Research Ltd, October 2013. MPI
Technical Paper No: 2013/47

This time around the situation has changed somewhat with respect to the known salmon diseases in New Zealand. It is undisputable that existing NZKS salmon farm sites in the Marlborough Sounds have been infected with previously unknown piscirickettsia and Tenacibaculum pathogens since 2012.



Source: Product Disclosure Statement and Prospective Financial Information, New Zealand King Salmon Investments Ltd, 23 September 2016.

This NZKS sourced graph clearly shows that within the last few years the salmon mortality has increased from 4% in 2010, to 11% in 2012 to a high of 18.7% in 2015 and with the hope of 11% mortality in 2017 and beyond.

Looking at the graph it is clear that the **salmon mortality is not under management control**. Worse, it seems 11% total mortality is now the new norm and not seen by NZKS as worthy of reporting as an unusual mortality event. Compare this to 2012 when an 11% total mortality resulted in a full-scale disease investigation.

The mass mortalities of the last 5 years have cost millions of dollars in loss of earnings every year and have **seriously undermined** the “clean green” reputation of the Sounds. These repeated mortality events underline why MPI put in place Controlled Area Notices aimed at trying to stop the spread of these previously unreported pathogens.

The investigation report produced in 2013 by MPI did not find a specific disease, but made the following recommendation:

*No cause for the mortality event was identified by the investigation, however in retrospect sampling was only carried out after the peak mortality. **Further investigation to identify the cause of this annual mortality increase, and whether it is related to the external ulcers, heart pathology and suspected intracellular parasites is recommended in the future (emphasis added).***

As far as we can ascertain to date that recommendation/finding was not followed up in 2013 nor in 2014 by MPI biosecurity or King Salmon. As far as we can ascertain King Salmon did not see fit to hand over to MPI any more diseased salmon for further investigation, despite the mounting mortality rate over this period.

With their actions, our view is that they risked infecting the wild fish and other sea life in the Marlborough Sounds such as the nearby scallop beds.

SCALLOPS

Scallop diseases in New Zealand during 2015 – an investigation by MPI

This MPI report states that:

The scallop specimens from Pelorus Sound, collected in August/September 2015, were sourced from Waitata Bay and Ketu Bay. These showed a high load of a rickettsia-like bacterium in the gills and digestive gland. These organisms are common in New Zealand shellfish and cause major disruption to the gills, which in bivalves function primarily as a feeding organ. Note that the specimens collected from North West Bay and Horse Shoe Bay earlier in the year also had high loadings of an opportunistic bacterium, in this case Vibrio splendidus.

We **contend and recommend** to the Advisory Panel that an independently scientific review be carried out to ascertain if the rickettsia-like bacteria found in the scallops is similar to the NZ-RLO (Rickettsia like organisms) now found in the farmed salmon. After genetic sequencing the Rickettsia like organisms can be compared - just as the NZ-RLO has been found to be very similar to the TAS-RLO found in the Atlantic salmon farmed in Tasmania.

KCSRA can understand the unease expressed by the commercial scallop representative organisation CSEC over the implications of this massive increase in salmon farming so close to already stressed scallop beds.

OTHER DISEASE TRANSFERENCE OR BLOWBACK RISKS

Dr. Diggles has updated his report with a risk assessment of the risk that wild fish stocks get infected with the piscirickettsia pathogen. He found it was a Low but **unacceptable risk** to take, if the farmed salmon are clinically diseased and show signs of this disease.

But he then goes on to assess the risk as an acceptable Very Low risk if the salmon are only sub-clinically infected. In other words, not showing clear symptoms. What is not explained by Dr. Diggles is how he can be certain that sub-clinical infections do not progress to clinical infections, or more likely a mix of minor and severe cases of the disease?

We are concerned that no evidence has been produced by MPI or NZKS to the Panel on this aspect.

From an article in the New Zealand Journal of Marine and Fresh Water Research in October 2016 we note the following paragraph:

Examination of ten moribund fish in the summer of 2015 revealed multiple areas of ulceration over all areas of the body including fins and mouth in eight of the 10 fish. As these fish presented with skin lesions, Piscirickettsia salmonis was included as a differential diagnosis. Testing for this agent was conducted and a rickettsia-like organism (RLO) was detected in all fish.

In our view, the above descriptions sound a bit worse than “sub-clinically infected” salmon.

If so, then in our view the Marlborough Sounds marine environment has already been subjected to an unacceptable risk, due to the uncontrolled salmon infections with the rickettsia like organism for several years.

As a prevention response Dr. Diggles recommends use of best practice methods to control known risk factors, including:

maximizing water quality, using broodstock that have never been exposed to seawater, rearing fish at lower densities, allowing farms in a given region to fallow, controlling ectoparasites that may act as vectors and avoiding horizontal transmission between year classes by holding single year classes of fish at any given site.

To date as far as we can ascertain , NZKS **does not** practice single year classes on all its farms, **does not** practice rotational fallowing of its farms and **has not** implemented best management practice at all its farms.

Accordingly, It comes as no surprise to KCSRA that the piscirickettsia disease outbreak is still **not under control**.

ALGAL BLOOMS AND HARMFUL ALGAL BLOOMS

Unfortunately, Dr. Diggles only estimates the risk of certain infectious disease agents, although he acknowledges there are non-infectious agents and parasites, such as algal blooms, isopod invasion and jellyfish strike, but leaves it to others(the Sounds community?) to do the risk assessment.

Increased risk of algal blooms are often linked to increased nutrient loads from finfish aquaculture. Algal blooms represent a risk not only to farmed salmon, but also to other aquatic animals, to seabirds such as the King Shag and the wider environment. Algal blooms cause reputational damage to the clean, green New Zealand image.

The Cawthron institute has published a report, number 2182 with the title: "*Alexandrium Catenella Blooms and Associated Saxitoxin Contamination of Shellfish, March to June 2012*" about their investigation into a harmful algal bloom in the Queen Charlotte Sound. We paraphrase as follows:

In early March 2011, a bloom of the saxitoxin (STX) producing dinoflagellate *Alexandrium catenella* developed in Tory Channel and spread throughout the greater part of the Queen Charlotte Sound. The algal bloom lasted till late April, although the ban on commercial shellfish harvesting did not end at East Bay until 20 June 2011. *Alexandrium catenella* is common on the north east coast of the North Island, especially in the Bay of Plenty and Bay of Island regions, where there is a history of recurrent blooms.

Solitary *A. Catenella* cells have been observed in the outer Pelorus Sound and Port Underwood. It cannot be predicted whether major blooms will develop in these areas in the future, but if this new farm proposal goes ahead (bearing in mind the recent expansion in large salmon farms), it is we believe be **more likely** than in the past.

If *A. Catenella* becomes established in the main mussel growing regions it may develop into a chronic annual problem causing serious disruption of the industry's harvesting operations. KCSRA can understand the unease expressed in the mussel farming organisations such as Sanford Limited over these implications for their operations.

As recommended in the report, a sea water monitoring buoy has been placed in Opuia bay of Tory channel, monitoring conditions that promote *Alexandrium Catenella* blooms, as cysts of this type of algae are present in the benthic.

Harmful algal blooms are now a yearly occurrence in parts of the Marlborough Sounds. This proposal will in our view significantly increase the number and incidence of these very damaging occurrences.

SEA LICE

Several species of sea lice occur in the wild in New Zealand. They are present in numbers the Mahau Sound section of the Pelorus Sound, as a KCSRA member found out when a couple recently latched on to his legs. In Kaikoura commercial fishermen have been fined for leaving set nets for over 24 hours in the water. This is not allowed as it attracts sea lice to the caught fish.

Sea lice infestations in salmon farms are world wide a growing problem and cause a significant loss of salmon production. Several methods have been tried to eliminate the sea lice, but it seems not to be working. The treatment costs combined with the cost of lost production are now so high that land based or closed containment farming becomes a financially viable alternative.

However, Dr. Diggles estimates that there is still only a low potential risk that the farmed Chinook salmon get infected with sea lice. The potential risk of exposing the wild fish once infected is estimated as Moderate, which combine according to table 5 in his appendix 1 to a combined risk as “a blank square”, which Dr. Diggles interprets as Low. The square is left blank as there are inconsistencies in this table that cannot be reconciled. KCSRA queries the validity of this risk assesment.

King Salmon seems confident that sea lice infestaions will not become a problem if production volumes (intensity of farming effort) massively expands. The KCSRA contary view is that it seems only a matter of time before sea lice become a problem in the salmon farms here, as new farms are added and the increased production is concentrated in just two locations in the Sounds.

Conclusion

In conclusion, KCSRA believes the enhanced disease risks arising from massively increased salmon production, alone outweigh the economic benefits hoped for by NZKS employees and shareholders from this environmentally unsustainable proposal.

Kenepuru and Central Sounds Residents' Association
8 May 2017