

11th July 2016

Stephanie Hopkins
Ministry of Primary Industries
118 Vickerman Street
Port Nelson

Dear Stephanie,

Once again my apologies for taking a little longer on this than I had anticipated.

Please find outlined below my response to your request for a peer review of the Cawthron assessment of information relevant to finfish farming at Tio Point, Oyster Bay in the Marlborough Sounds (Clark and Taylor, June 2016).

The report by Clark and Taylor (2016) assessed information contained in both a preliminary ecological survey by Anderson and Grange (NIWA) in April 2013 and in a subsequent site assessment by O'Callaghan et al. (NIWA) in June 2014. Also included in the review were the results of some additional sampling to address specific gaps identified in those earlier reports as part of a summary report from Cawthron (May 2016). The resultant Cawthron report (2016) provides a comprehensive assessment of the benthic conditions at both the existing and proposed Tio Point site locations, with a detailed characterization of the bathymetry and benthic habitats, and an evaluation of the significance and potential sensitivity of the epibenthic and infaunal community assemblages. The report also provides depositional modelling outputs for feed input levels that would ensure that the benthic footprint within the lease is compliant with benthic standards as defined in the Best Management Practices for Salmon Farming in the Marlborough Sounds (Keeley et al., 2015). The data collection (both from NIWA and Cawthron) would appear to have followed the protocols and methods recommended by MPI for such assessments. The data and analysis presented are at a very high level, and the findings and recommendations would appear to be entirely consistent with that data. I am confident that this report will provide a relevant and valuable baseline for subsequent assessment of this proposed development.

The report is generally well written and easy to understand, with some minor textual errors that can be easily addressed in subsequent drafts. I have a number of relatively minor comments and suggestions to make on the content and have outlined these separately below.

Comments/ Points for Clarification:

General Points

The differences in the physical characterisation of the site in the recent Cawthron assessment and that of the NIWA studies were relatively minor and largely associated with differences in depths. With the exception of the discovery of an indentation/ hole to the NE of the proposed site, these bathymetric difference could be a function of instrumentation or issues with georeferenced sampling points. The effect and significance of the “hole” and how that relates to the report is discussed later. The key species differences were largely associated with species which are common but spatially patchy in their distribution, and as such would be easy to miss.

It might be worth clarifying up front whether the intention of this report is to just provide a condition statement, or whether there is an expectation to provide recommendations on monitoring management. There are some areas where clear management recommendations are identified e.g. *“it will be important to monitor the reef communities at Tio point to check for signs of enrichment”* and other areas where such recommendations would appear to be missing e.g. *“tubeworm beds appeared restricted to shell hash habitat in the vicinity of the proposed farm and may be impacted by farm deposition”*.

Habitat/ Benthic Ecology

The report identifies a broad range of species and ecological features within the study area and provides some assessment of the significance of these habitats in the context of the region as a whole. This is important as it provides a more holistic understanding of the ecosystem risks associated with interactions between these features and farming activities. For example, some species may be quite unique within this site/ region and therefore would potentially need greater consideration than species which are ubiquitous throughout NZ. It may also be useful to provide an understanding of the often transient nature of the “biogenic clumps”, and the fact that these can form, degrade and reform naturally as well as in response to a range of environmental circumstances. This sort of context would provide a clearer risk framework for decision making. This is particularly important given the statement in the discussion that *“the depositional footprint is likely to overlies the occasional notable ecological feature”*.

There would appear to be three areas identified in the report which have potential to be of environmental concern; firstly, that there are reefs and biogenic structures located relatively close to the proposed farming site, the hydroid communities which are known from this area and are of local significance but sparse in this particular location and thirdly, the fact that the large depression (hole) near the site may provide an area for organic matter accumulation. That said, it is worth noting that the relocated site is for

the most part moving the farming activity further away from the reefs. I couldn't see in the Cawthron data just where the hydroid communities were located but given they are listed as a species of particular interest it might be good to include this on the plots showing the interaction with the depositional modelling at least (i.e. Figure 15). This assessment would seem to be suggesting that this species had reached a level for further study, so perhaps this will be clearer in subsequent reports? In Figure 15, it would also be useful to show the location of the "hole" alongside the other key habitats.

It was not clear to me in reading the report (or associated documentation) whether the existing lease had ever been active? This is important to clarify as an operational farm might affect the baseline ecology. Having said this I am confident from the biological results presented that this lease was effectively an "unfarmed" site, but that it would be useful to make this clear.

I note that in the report by O'Callaghan et al (2014) there was some discussion of the hydrodynamics and current flow around the site and wondered why this has not been included in this review. I would think that this information could help to inform the risk associated with the potential for accumulation in the "deep hole" and also possible reef interactions.

Whilst the inclusion of the 3D bathymetry maps is great in principal, and it is clear that these would provide additional insights into the topography (particularly the underwater depression or hole to the NE of the proposed site), the actual visualization needs some improvement as it is very hard to see specific features, and the contour lines disappear at depth – this may just be an issue with the colour scheme selected.

Depositional Modelling

This is one area where marked differences were identified between the Cawthron study and the earlier studies undertaken by NIWA. The report suggests that the new bathymetry can account for these differences, but it would be useful to have some further clarification on this as the depth contours didn't seem that different - with the exception of the deeper hole to the NE. Could the hole really account for a complete change in the depositional footprint? If possible some additional explanation here would be useful.

I note that for the Cawthron report the depositional modelling was only represented for one feed scenario, whilst in the other studies a number of different scenarios were presented. If the modelling in this study represents the optimal inputs/ output scenario it would be useful to clarify that.

Finally, in the presentation of the modelled outputs the Cawthron team have chosen to show a more detailed gradient of response, whilst the previous NIWA studies had grouped the deposition levels into categories relevant to management action levels. It would be good to have both perspectives included. The gradient provides a better understanding of the pattern of spatial change, whilst the categories provides a very quick and clear illustration of potential risk.

Conclusions

Can you clarify what you mean by “*at sufficient distances from the proposed site*”?

Is this to ensure no impacts, or to suggest that impacts are likely to be minimal/ acceptable?

The conclusions do not mention anything about the “hole?”

- either in terms of it not being identified in previous studies or whether it presents any significant issues for monitoring/ management.

Once again, my apologies for the slight delay in getting this review to you.

I would be very happy to clarify or discuss any part of this with either yourself or the team at Cawthron.

Please feel free to contact me directly if you have any further questions.

Regards,



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