

Marlborough Salmon Relocation Economic Impact Assessment

Peer Review

16 November 2016

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1. Peer Review of PwC’s Economic Impact Assessment

This peer review is of the Economic Impact Assessment for the Marlborough Salmon Relocation (‘EIA’ or ‘the report’), as requested by the Ministry for Primary Industries (MPI).

MPI, the Marlborough District Council, New Zealand King Salmon (NZKS) and other stakeholders are engaged in a process of reviewing the performance and impacts of salmon farms in the Nelson Marlborough region and assessing options to either manage the current sites differently or developing new sites.

As part of this process, MPI and the stakeholders commissioned PwC to prepare an independent economic impact assessment (EIA) to evaluate options to support the decision making process. This report focuses on providing an independent peer review of the PwC report to provide assurance to decision-makers that the analysis is robust and can be utilised for decision-making purposes.

This peer review is prepared solely for the purpose of reviewing the EIA prepared by PwC and should not be relied upon for any other purpose.

This review takes the following structure:

- u Section 1.1 summarises our key findings with respect to the robustness of the EIA modelling performed.
- u Section 1.2 summarises our review of the methodology.
- u Sections 1.3 – 1.5 considers analysis performed on the operational and capital impacts of Salmon Farming, and the impacts of Best Management Practice (BMP) guidelines on the industry, and provides a tabular summary of concerns and issues identified.

1.1 Summary Comments

The EIA utilises an appropriate methodology, documents its assumptions well, and in our view correctly considers the key economic drivers likely to be affected by changes to salmon production in Marlborough. We therefore consider that this analysis provides an acceptable basis for decision-making.

The analysis employs input-output (IO) multipliers to calculate regional economic impacts, which have a number of well-known analytical shortcomings (as documented on page 15 of the EIA), but we consider that the IO methodology employed is appropriate and generally prudent. It is not anticipated that a different methodological approach would change the results of this analysis significantly enough to warrant more time-consuming, expensive approaches to analysis (such as Computable General Equilibrium or CGE modelling) which consider labour market availability and price effects.

The inclusion in the EIA of a short analysis examining the potential change in market supply of salmon resulting from implementation of BMP, and overall labour market capacity could serve to address criticisms of the modelling approach chosen.

There are some issues that arise repeatedly throughout the analysis, which are summarised below. These issues are relatively minor, and some are artefacts of IO analysis that could be better documented.

The identification of these issues does not change our view, as stated above, that this EIA generally conforms to accepted principles and methodologies for an analysis of this type.

The key issues of note are:

- u This EIA employs strong assumptions about the ability to meet labour demand locally. The assumption that labour needs can be met by the market under analysis is a feature of IO multiplier analysis, but clearer exposition of the risks of this assumption to the analysis would be useful.
- u There are occasional inconsistencies between the assumptions employed regarding the imported versus in-region production (see Sections 1.3-1.5 for further detail). The rationale for the assumptions underlying domestic (or in region) production could be better documented.
- u There is no formal sensitivity analysis regarding the parameters and assumptions employed. This is not necessarily standard procedure for an EIA, but providing quantitative context as to the sensitivity of those inputs and assumptions that drive the results would be helpful.
- u The range of potential impacts from implementing BMP is broad, with effects ranging from a decrease in overall production to an increase over baseline production levels. The EIA notes that this is driven by ranges reported in the Cawthron Institute report. If sufficient data is available, further analysis that considers the likelihood of different outcomes would be valuable to decision-makers considering the implementation of BMP.

Providing additional clarification on these matters will support the EIA, and may serve to make it more robust to scrutiny from relevant stakeholders.

1.2 Review of Methodology

Assumptions and Application of Methodology

The general assumptions outlined across the methodology and analysis for each individual option have been provided and appear to be reasonable, and we have checked that the application of the methodology is consistent throughout the EIA. The report considers local and imported sources of goods, and considers the total expenditure that is likely on capital construction and from operational production.

The mapping of the relevant areas of capital and operating expenditure to IO categories is sensible, although we would note that it provides for a potential source of error, given that the multipliers for each sector are developed using a relatively wider mix of industries. This may overstate the impact of certain activities (where the multiplier contains non-Salmon related industries that occur disproportionately in the area under investigation) or underestimate them where the opposite is the case. Again, this is a feature of Regional Input-Output Analysis and is not of particular concern in this analysis.

The allocation of costs to IO classifications is also performed appropriately, and is based on actual data from the salmon industry, although we have not independently verified the underlying figures.

We have not been provided with the multipliers used, so we cannot independently verify if the correct multipliers have been used, but the results appear sensible and expected, given standard ranges for similar regions and industries.

Value Added (GDP) and Employment Analysis

Value added appears to be calculated correctly, utilising expenditure data which is then disaggregated into value add and intermediate inputs using IO tables and PwC's RID model. We have not reviewed the RID model, but the summary diagram presented in Appendix A, suggests a logical approach that takes into account regional factors that are likely to enable a robust consideration of industry composition.

As anticipated, the production and processing of salmon is the primary source of value-add from this industry, as the expenditure it enables in other industries (e.g. advertising) are mostly out of region and are not included in GDP calculations. Intermediate flows are excluded, but a portion of the economic activity enabled in supplying industries is included (as first round and industrial support effects), which is the correct approach.

Employment effects are calculated similarly, using different multipliers. It is not clear whether the adjustments in FTE level for productivity and labour intensity are derived directly (i.e. from primary data), from the PwC RID model, or whether they represent features of the IO multipliers used. The former is preferable (although rare in practice), but all approaches would be acceptable.

It would, however, be useful to more clearly document the approach used.

Analysis of BMP Impacts

The analysis takes a two-stage approach, calculating the economic activity (value add and impact on FTEs) generated from the hypothetical conversion of farms to meet BMP guidelines. This is then compared with 'BaU' activity levels, to determine the net impact. It correctly considers the impacts of implementing BMP, including:

- u changes to feed discharge levels and
- u changes to fallowing guidelines.

The EIA reports on the change in production due to these guidelines and calculates the net impact. The report then usefully and correctly considers the commercial viability of these sites after a hypothetical conversion, and is careful to note the reasons that NZKS might continue to operate some facilities even when they are no longer viable as stand-alone entities.

It goes on to provide different scenarios of economic value add / employment decrease due to implementation of BMP, based on an 'unconstrained' commercial environment (based on baseline production) and one in which commercial considerations are considered.

The EIA then proceeds to conduct a similar (but distinct) analysis on 'new' high-flow salmon sites using similar assumptions and methodology. We have reviewed these results relative to the other calculations within the report and found them to be consistent.

The following three sections consider the methodology used to calculate operational, new capital investment, and BMP impacts in more detail. They identify, in tabular form, areas where additional clarification could service to enhance the report.

1.3 Salmon Farm Operations: Detailed Review

Review of Analysis & Methodology	
Key point	EY Comments
Regional Employment Capacity	<ul style="list-style-type: none"> ⌋ There is limited consideration given to the available workforce in the region, for example by reporting on unemployment levels, demographics, and educational attainment. ⌋ A more detailed analysis of unemployment levels and workforce in the region would identify if the labour levels required can be met in the region.
Model FTE	<ul style="list-style-type: none"> ⌋ Page 19 of the report acknowledges that the modelling undertaken utilises an estimate of 285 FTEs over the two regions supporting an output of 6,000 tonnes of Salmon. ⌋ The actual value is 321 FTEs. This discrepancy is not explained except to note that it provides for a 'conservative estimate.' We assume that this may be due to a renormalization of production from an actual to an estimated value, but further explanation as to why estimated rather than 'actual' values were utilised would be worthwhile.
Price Sensitivity	<ul style="list-style-type: none"> ⌋ IO methodology assumes that prices are fixed. ⌋ It is reasonable to assume that changes to production at the levels being considered would not have significant price effects, but it would be useful to reference the percentage change in production (relative to national production) being considered to further support the use of price insensitive modelling.
Allocation of Operating Expenditure	<ul style="list-style-type: none"> ⌋ The analysis assumes that all packing materials are sourced in the region, but the report identifies that packing materials are sourced from within the region or from China. ⌋ This is not likely to make a material difference, but sensitivity testing would be warranted.

1.4 Salmon Farm Capital Expenditure Review

Review of analysis	
Key point	EY Comments
Regional Employment Capacity	<ul style="list-style-type: none"> ⌋ The analysis assumes that all FTE required for capital and construction expenditure will be sourced from the region, as in the operational section additional context would be useful to understand whether it is likely that the region can support this employment increase.
Allocation of Capital Expenditure	<ul style="list-style-type: none"> ⌋ Capital expenditure required was assumed to be \$6m over one year for each new site. ⌋ Pen structures and Polyester nets were assumed to be sourced in the region, but it seems likely that at least some of these structures will be sourced from outside the region or overseas, reducing the overall economic value.

1.5 Best Management Practices Impact: Review

Review of analysis	
Key point	EY Comments
Change to Production Levels	<ul style="list-style-type: none"> u BMP were quantified using the feed discharge levels using Cawthron Institute's projected feed discharge levels. u The analysis appropriately takes into account lost production resulting from temporary destocking requirements. u It would be worthwhile to more clearly summarise the potential losses to production from changes to feed discharge levels versus those resulting from fallowing.
Calculation of Impacts	<ul style="list-style-type: none"> u The use of this multiplier analysis to calculate the likely impact of employing BMP has also been performed in accordance with accepted practice.
Price Effects	<ul style="list-style-type: none"> u As previously noted, it is unlikely that changes to production at the levels being considered would have significant price effects, but it would be useful to reference the percentage change in production (relative to national production) being considered to further support the use of price insensitive modelling.

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