

APPENDIX FIVE

Interpreting Revenue, Income and Present Value of Losses

APPENDIX 5 INTERPRETING REVENUE, INCOME AND PRESENT VALUE OF LOSSES

1 Lost landings revenue, lost annual income, and the present value of losses provide alternative measures of the likely impacts on the fishing industry and on related sectors of the economy. It is important to understand each measure and to make informed comparisons of these impacts.

2 In general, lost value of landings does not provide a good measure of the social and economic impact of TMP restrictions. Rather, the changes in income earned in the fishing industry and in related sectors is a better measure of the impacts of TMP restrictions.

3 The Ministry of Fisheries (MFish) has expressed the income losses in two different forms: as annual income losses (which might be considered first-year losses) and as the present value of the annual losses. These two sets of numbers measure the same changes, but on different time scales. If one thinks of the benefits of TMP options in terms of annual benefits, then the logical comparison is to annual costs. On the other hand, to understand the total economic impact of a decision over all future years, the present value of annual income losses is appropriate.

4 MFish used an economic model of the New Zealand economy to estimate direct harvesting income, direct processing income, indirect income, and induced income. Indirect income is the income generated in sectors that supply harvesting and processing sectors. Induced income is the income generated in the broader economy as other income is spent and generates demand for the output of consumer products.

5 When assessing the income impacts, the greatest concern will probably be the direct harvesting income losses and, to a somewhat lesser extent, direct processing income losses. Indirect income losses and induced income losses should probably generate less concern than the direct income losses.

6 When interpreting lost income, it is important to remember that when labour and capital are displaced from an industry, those factors of production will seek employment elsewhere. The social and economic impact of any displacement depends in large measure upon how hard or how easy it is for these factors to find employment elsewhere.

7 The impacts on labour and capital in the harvesting sector are the most direct. Labour and capital in the harvesting sector are likely to face the most difficulty in finding alternative employment. The seriousness of the impacts on labour and capital in the processing sector depends in part upon the other fish processing options that may exist. Where other fish products may be available for processing, the incomes losses may be offset by switching to other products. If, however, few alternative products are available for processing, the impacts may be much larger.

8 The methodology described above estimates the first-year impacts of options. The first-year impacts present an incomplete estimate of losses, because some of those losses will recur.

9 MFish examined each type of loss and capitalised first-year income losses into permanent losses by making the following assumptions.

- a) **Quota value.** The loss of quota value is assumed to be permanent.
- b) **Direct income in harvesting.** Because the capital and labour in the harvesting sector cannot be easily transferred to other uses, losses equal to several years of income will be incurred as resources are unemployed or underemployed. To approximate the losses through the adjustment period, a loss of 5 times the initial displaced annual income is used in calculations.
- c) **Direct income in processing.** The capital and labour in processing is less specialized to particular species, so the likely adjustment period will not be as long for processing. A loss of 2.5 times the initial annual displaced income is used in calculations.
- d) **Indirect income in supply sectors.** The sectors supplying the fishing and processing sectors also supply very similar products to other industries and sectors. The adjustment process for supply sectors will involve producing similar products for other sectors. A loss of 1.5 times the initial displaced income in supply industries is used in calculations.
- e) **Induced income in broader economy.** Because the total changes are small in relation to the overall New Zealand economy and because the New Zealand economy is currently operating at high levels of employment and capacity use, MFish believes that the broader adjustments by the economy will be rapid. MFish used one year of induced income losses.

10 MFish emphasizes that the estimated multipliers in the preceding paragraph are informed judgments. They are inherently imprecise. And because they multiply the annual impacts, they are the single most important driver of the final estimates of the present value of impacts. MFish believes that they are appropriate for the purpose of thinking about how changes are likely to unfold in the future. They are especially useful in understanding qualitatively which restrictions are associated with the largest costs, and which restrictions are less important in terms of overall cost impacts. But it is inappropriate to read high precision into the present value of losses that are computed from these income multipliers.

11 MFish developed estimates of the impact of TMP restrictions on quota value. MFish would caution that these estimates are based on an assumption of quota value reductions that are proportional to reductions in catches. How ACE prices and quota value are impacted by TMP restrictions will be the result of market forces in ACE markets, and are unlikely to be as uniform as MFish assumed in its assumptions. Because ACE price is a cost for the harvesting sector, the estimates of quota value affect the distribution of costs but not the overall level of costs.

12 In its tables, MFish does not report quota value as part of the annual, recurring losses. But because ACE generates income for the quota owners, reductions in ACE value are implicitly included in the definition of income. The owners of ACE may be in the harvesting sector, the processing sector, or in the other sectors supplying the harvesting sector. ACE may generate income explicitly, when ACE is sold to a third party to use, or implicitly, when a vessel has higher income because it does not have to purchase ACE. The estimates of loss of annual income therefore, quite correctly, include the value of ACE but not the permanent quota value loss.

13 For the estimates of the present value of income losses, MFish did include the value of lost quota. But, because quota value is the present value of future ACE value that it generates, it is necessary to reduce annual income by an estimate of ACE payments before capitalising those annual incomes.