REGIONAL ECONOMIC IMPACTS
of
WEST COAST CONSERVATION LAND

Final Report

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Contents

SUMMARY OF THE PROJECT

The Department of Conservation (DOC) administers some 1.9 million Ha of Public Conservation Land (PCL) in the West Coast Conservancy. It spends $13 million annually and directly employs 150 people in the region to manage this estate. The land is used extensively for private sector commercial activities by the 682 non-mining and 58 mining concession holders who pay DOC about $1.3 million per year to use the public conservation lands. The non-mining concessions relate primarily to farming, tourism and public utilities such as Telecoms and electricity lines companies.

The maintenance and use of the conservation land gives rise to considerable economic benefits and economic and social impacts in the region, but this study examines and reports on only the economic impacts as measured by value added, household income and employment. Other economic benefits associated with consumer and producer surplus related to these lands are not addressed[1].

The primary objective of this project is to demonstrate how significant the public conservation lands are to the West Coast regional economy[2]. This scoping and inception report provides a brief overview of the literature, provides preliminary estimates of impacts, discusses limitations of the analysis reported herein, and identifies further research which could be undertaken to improve the accuracy and extend the scope of these estimates of economic impacts.

The principal source of impacts associated with the conservation lands are expected to be:

- DOC activities;
- Operation of concessions; and
- Commercial activity outside the conservation estate which depends on commercial and non-commercial use of the conservation estate, particularly by tourists.

This latter effect includes the multiplier effects arising from the support infrastructure for farming, mining and tourism concession activities as well as the impacts of any forward linkages of these activities and general visitor use of the PCL. These forward linkages include processing of primary products produced on the PCL and the provision of all the goods and services purchased by tourists who come to the West Coast so that they can use the conservation lands and/or the concessions that operate on them.

To estimate impacts we have:

- Gathered detailed data on DOC expenditure on the West Coast;
- Estimated the total commercial value of the concessions operations on PCL;

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[1] While total benefits may be much larger than the benefits associated with the commercial impacts reported here, these wider benefits have been excluded from the analysis because of the difficulty and cost of measuring them, the error margins inherent in such measurements, and the difficulty in placing the results in any meaningful context (other activities also generate consumer and producer surplus but this is not measured or reported anywhere).

[2] An earlier study by Gough and Ball (1995) undertook this work in a preliminary way, but did not attribute any particular proportion of West Coast tourism to Conservation lands.

- Estimated the approximate proportion of West Coast visitors who have come to the West Coast so that they can use the DOC lands or the concessions, and applied this proportion to updated[3] estimates of the economic impacts of visitor spending in West Coast region; and
- Updated the West Coast regional economic models from 1995/96 to 2000/01 and estimated tourism, farming and mining industry multipliers. We have also incorporated DOC expenditure and employment data into the model to estimate West Coast Regional multipliers for DOC operations themselves.

We report all these impacts in terms of local output, value added, household incomes and employment. We then put these impacts into the context of the relevant local and regional economies to show how significant these operations are from the local perspective.

[3] The visitor spending estimates are based on data relating to the annual economic impacts of tourism in 2000 (see Butcher 2001), as adjusted to take into account the wider geographic coverage of the West Coast conservancy and the increase in tourist numbers between 2000 and 2003.

RESULTS AND CONCLUSIONS

1. The West Coast Region economy is contracting with employment having fallen by 8 per cent in the 15 years to 2001. While many peripheral districts in New Zealand declined as a result of the government policy change in the late 1980s and technology changes since then, West Coast is one of the few regions where employment has continued to decline even in the last five years.

2. The direct economic activity associated with DOC operations is output of $12.8 million, employment of 150 FTEs and value added of $7.4 million[4], including payment of $6.4 million in wages and salaries.

3. The non-mining use of Public Conservation Lands (PCL) via concessions for tourism, farming and other activities such as gathering sphagnum moss generates direct annual output of $21.4 million, employment of 164 FTEs and Value Added of $9.4 million including $5.4 million of household income. These figures exclude economic activity associated with easements for telecommunications sites and power lines other than the amount of the annual concessions payments.

4. The mining use of the PCL currently generates output estimated to be worth $10.3 million at mine gate. The major production is coal, followed a distant second by aggregates with metallic minerals being worth slightly less than aggregates. Associated with this mining is direct employment estimated at 19 FTEs and value added of $5.1 million including wages and salaries of $1.2 million. The employment and value added figures are based on industry averages rather than reviews of the actual operations currently on DOC lands. These figures also relate to actual production and exclude exploration. Hence they understate the true situation. The figures also exclude the very large projects that have recently been approved including Pike River, Globe Progress and Blackwater, which are on PCL or have access over PCL, and between them would generate about 260 direct jobs in mining.

5. The volume of tourism in West Coast Region in the year ended March 2003 is estimated to be 2.1 times as great as the volume of tourism in Westland District[5] in the year to December 2000[6]. The implication is that tourism in West Coast Region in 2003 supported direct employment of 1,870 FTEs, output of $208 million, and Value Added of $112 million, including $60 million of household income. While there is no data available to compare spending per night in Westland with spending in Buller and Grey, our expectation is that Westland spending will be somewhat higher because of the significant expenditure in this area on activities such as high-cost scenic flying. However, since spending on all activities[7] in Westland is only 25 % of the total visitor

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[4] Output is the value of sales, whereas value added is the value of output less purchases of inputs from other suppliers. Value added includes wages, taxes, interest, depreciation, self-employed income and profit.

[5] Research in 2001 (Butcher *et al*) referred only to the Westland District, and this has to be rated up to get total figures for West Coast region.

[6] Assuming that visitor spend-per-night in Grey and Buller districts is similar to spending in Westland.

[7] Primarily flying and guide walks

spending, then we would expect any overstatement of direct economic impacts in the West Coast region to be less than 10 per cent. We would also expect that use of commercial accommodation statistics to rate up Westland to West Coast data would lead to an understatement of Grey and Buller tourism, and these two effects will be to some degree offsetting.

6. A review of visitor survey data generated by Lincoln University in 2000/01 suggests that the Public Conservation Land (PCL) is responsible for a very large proportion of total West Coast tourism, probably in excess of 65 %. That is, we expect that at least 65 % of visitors to West Coast region would not go if they could not view and use the PCLs.

7. If this is the case then the PCL supports economic activity in tourism equivalent to $136 million in output, 1,220 FTE jobs, and value added of $73 million, including household income of $39 million. Note that these figures include the visitor expenditure on DOC tourism concessions.

Summary Table 1 Direct Economic Impacts of DOC Spending and Activities using Public Conservation Lands

	Direct Output ($m/year)	Direct Value Added ($m/year)	Direct Household Income ($m/year)	Direct Jobs (FTEs)
DOC Conservancy Activity	12.8	7.4	6.4	150
DOC Visitor Concessions	15.2	6.9	3.8	108
Other Visitor Spending by Visitors dependent on PCL	120.3	65.8	35.4	1,109
Mining	10.3	5.1	1.2	19
Other Commercial Activity on PCL	6.2	2.5	1.6	56
TOTAL DIRECT	**164.8**	**87.7**	**48.3**	**1,442**

8. We have estimated the total direct and flow-on (multiplier) effects of the PCL on the West Coast Regional economy by building an appropriate economic model and incorporating into it the financial and operational data made available by DOC to estimate DOC operations multipliers, by modifying and updating earlier estimates of Westland tourism multipliers, by estimating multipliers for other activities on PCL, and by applying these multipliers to estimates of direct economic impacts of DOC and PCL-related activities (see Summary Table 2).

Summary Table 2 Total Economic Impacts on West Coast Region of Economic Activity associated with DOC and the Public Conservation Lands

	Total Output ($m/year)	Total Value Added ($m/year)	Total Household Income ($m/year)	Total Jobs (FTEs)
DOC Conservancy Activity	21.4	11.3	8.2	209
DoC Visitor Concessions	23.6	11.5	6.3	173
Other Visitor Spending by Visitors dependent on PCL	155.9	84.8	44.3	1,283
Other Commercial Activity on PCL	20.7	10.2	3.4	149
TOTAL ALL ACTIVITIES (2003)	**221.6**	**117.7**	**62.1**	**1,814**
Total West Coast Region (2001)	2,175	980	480	12,321
DOC and PCL as % of region	**10.2 %**	**12.0 %**	**12.9 %**	**14.7 %**

9. It is expected that the operation of DOC and the use of PCL will generate a total of 1,814 FTE jobs in the West Coast region as well as $118 million per year in value added, which includes $62 million per year in household income.

   As is shown in Summary Table 2, DOC spending and the activities dependent on PCL form a significant part of the West Coast regional economy. They are equivalent to 15 per cent of employment, 13 per cent of earned household income and 12 per cent of regional value added.

10. These preliminary results need to be interpreted with caution. They indicate the size of the economic impacts associated with PCL, but further work would make the results more robust and would provide a better basis for decision making. In particular, it would be valuable to undertake a visitor survey focussing on the degree to which trips to the region are dependent on the existence of PCL and commercial concessions on this land. The estimate of the value of minerals produced from PCL is based on mining which currently takes place, and the numbers are indicative only. More importantly, they ignore the large numbers which are likely to be employed in mining should the coal field at Pike River and the Macraes gold mining operations at Blackwater (Prohibition Shaft) and Globe Progress go ahead.

11. The information on moss collecting is based on returns provided by pickers, and the results are inconsistent with export data and existing knowledge of the proportion of moss which comes from PCLs. A draft report on this moss picking has been prepared by a researcher, but the work is incomplete. The information on farming values is based on a very approximate estimate of the number of stock units running on the land and an even more approximate estimate of the likely gross farm output per stock unit.

12. If further work is to be done, then probably the most important research is to undertake a survey of the significance of the PCLs on visitors' decisions to come to the West Coast. This research is likely to be expensive (of the order of $10 – 30,000) and the results could still have wide error margins. However, it would give considerably more confidence in the results related to tourism use of PCL.

13. This analysis does not indicate whether current use of the land is an efficient use of resources. Rather, it provides some indication of likely employment and income effects so that the community is better able to assess the commercial value of the land in its current use.

1. STUDY BACKGROUND

1.1 Extent of Public Conservation Lands and Debate on its Use

The West Coast Conservancy of DOC administers public conservation lands covering 1.9 million Ha (84 % of all land in the region), employs 150 FTE[8] people and spent $12 million in 2002/03 to administer and manage this land and the associated concessions, undertake nature conservation programmes and provide visitor services and facilities.

There is frequent debate as to whether the use of this land for recreation generates many economic benefits to the West Coast community, and in particular whether DOC concessions generate sufficient economic impacts to justify both the costs to DOC in managing them and any costs which they impose on other conservation land users.

1.2 Report Scope

Butcher Partners Ltd has been asked by DOC to estimate the economic impacts which are likely to be generated in the West Coast Region as a result of the current use of the conservation lands. The proposal specifically excludes analysis of the total benefits of the conservation estate, which will include both consumer and producer surpluses arising from the use of the lands and from the option and existence values associated with the land. This is because of the difficulty and high cost of estimating these values, the high margin of error in such estimates, and the fact that it is difficult to place such values in context. Other economic activities also generate such values to a greater or lesser extent but they are not measured, and so any figures related to conservation lands can only be put into a limited context. The report also does not look at the protection and species conservation values associated with PCL[9].

This is not to say that there are not potentially very high non-commercial values associated with the conservation lands, and such values certainly need to be assessed when deciding whether or not a particular piece of land should or should not be part of the conservation estate. However, it is not the purpose of this report to guide land allocation decisions at the margin.

1.3 Structure of the Report

The report begins with a brief review of the literature on economic impacts studies. It then describes the current size and structure of the West Coast regional economy so that the economic impacts associated with DOC land can be put into some useful context. The report goes on to describe the analytical framework and then presents estimates of the direct and total regional

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[8] FTE denotes full time equivalent. DOC has 135 Full Time permanent staff and 40 Full Time Seasonal staff, with the season lasting for about one third of the year.

[9] Whitebait values, which Gough and Ball estimated to be well in excess of $3 million per annum, have been excluded.

economic impacts of DOC's operations, the operation of economic concessions on DOC land, and the impacts of tourism which are dependent on the existence of DOC land. Impacts are reported in terms of output, household income, value added[10] and employment in the West Coast Region. The report concludes with a description of further work which could be done to improve the estimates reported here.

1.4 Basis of Estimates

Estimates of direct economic impacts of DOC operations have been made on the basis of financial and physical data supplied by DOC for the West Coast conservancy. These data have been incorporated into an economic model of the West Coast Region to estimate the flow-on effects through these local economies. Flow on effects depend on the depth of a region's economic base, and the relatively narrow economic base of West Coast means that multipliers are relatively small compared to more economically diverse regions such as Christchurch or Auckland.

Economic impacts of concessions are based on concession revenue for the year to June 2003, and the assessed relationship between gross concessionaire revenue and the concession fees paid to DOC. The total economic impacts of concessions are calculated by applying to these output figures the multipliers derived from the regional economic model. The economic impacts of the mining concessions are based on data from the Ministry of Economic Development, who are paid a royalty based on either the tonnage mined or the value of the product at the mine gate and who have used this data to estimate the total value of production of minerals on PCL.

The proportion of tourism on the West Coast which is dependent on Public Conservation Land (PCL) is estimated on the basis of visitor perception data collected by Moore *et al* (2001). The direct and total economic impacts of all West Coast tourism are based on estimates of the impacts of tourism in Westland district in 2000 made by Butcher (2001) which are then updated to 2003 and expanded to cover the total West Coast Region.

[10] Value added is the returns to labour and capital. It is the equivalent of household income plus profits (before interest, depreciation and tax).

2. REVIEW OF THE LITERATURE ON ECONOMIC IMPACTS ON CONSERVATION LANDS

There is a reasonable quantity of literature on the economic impact values for National Parks and similar areas, both in New Zealand and internationally. Some of the relevant studies are described below.

2.1 Tourism Impact Assessments

Almost all reviewed impact studies focused on the expenditure of visitors in the parks or adjacent towns and this was established by surveys of visitor spending and estimates of total number of visitors to the park. In some cases[11] the implicit assumption has been made that visitors to the Park see the Park as a sole destination of their stay rather than as a stop en-route to some other destination or as one of several attractions visited during a stay in the area. In other cases the analysis only included the proportion of visitors who came because of the National Park itself. For example, the Kangaroo Island study[12] included only the 60 % of visitors for whom the Park Experience was a "critical factor" in a visit to the island, and this percentage was the proportion who said in an exit survey that the Park experience was "very important" in their visit to the island[13]. All their expenditure on the island was included in the economic impact. Another example was the estimate of the economic contribution of Tasmanian Parks and Wildlife Service (PWS) Estate[14] which assessed the total spending on a trip to Tasmania of all visitors who visited a PWS site, and then multiplied this by the ratio of time spent at PWS sites : time spent at all activities[15].

For most studies, economic multipliers were established using input-output models. Direct economic impacts were rated up using these multipliers to provide estimates of total economic impacts.

The approaches described above are similar to the approach that has been taken in this paper to estimate the tourism impact, but other studies do not consider non-tourism economic activities in the Park. This presumably is firstly because the focus of the studies is on tourism and secondly because many parks are not used for other commercial activities. The shortcoming of this study compared to some of those in the literature is that we have a less robust estimate of the proportion of visitors who would not come to the West Coast region in the absence of the Public Conservation Lands and the proportion by which stays would be reduced for those who will come anyway. A second problem for this study is that there may be a difference in spend per person for those coming primarily because of the PCL lands compared to those coming for other reasons, but we have no data on this relativity and have simply used average spend per visitor for the entire visitor population to Westland. The majority of studies in the literature have surveyed expenditure of those actually using the PCL.

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[11] See for example Mules and Cambourne (2002)

[12] Hudson Howells *et al* (2002)

[13] The survey asked visitors "what was important in their visit to the island", but it is not clear if the answers related to what was important in their decision to come to the island or to their enjoyment while they were on the island.

[14] Centre for Regional Economic Analysis (2000)

[15] 57 % for international visitors, 61 % for visitors from Mainland Australia and 78 % for local visitors.

2.2 Total Impact Assessment

One study[16] was identified which did consider the total economic impacts for West Coast PCL. While the study did not make any firm estimate of the proportion of tourism which was due to conservation lands it did conclude that *"more than 70 % of visitors to the region are attracted by the presence of conservation lands and the opportunities created by them"*. This conclusion was based on an analysis of data on visitor motivations reported in Sandrey[17]. The study also considered other sources of economic impact including mining, farming, sphagnum moss extraction, fishing and hunting. It did not analyse the economic impacts of DOC itself other than to report total DOC expenditure, not did it consider multipliers for anything other than tourism. This report was a useful first attempt to analyse the likely type and scale of economic impacts arising from PCL, but it did not provide any summary of the direct economic impacts, did not look at flow-on effects for anything other than tourism, and did not put impacts into the context of the total West Coast economy.

2.3 Economic Benefit Assessment

There have been a number of studies both in New Zealand and overseas which have attempted to measure the economic benefits of conservation lands, either from a narrow viewpoint by putting values on human enjoyment from use[18] or from a more holistic viewpoint by looking at social non-use impacts or by considering the wider benefits of, for example, maintaining biodiversity. Since the scope of this study excludes these other economic and environmental benefits, the literature on the economic benefits of conservation lands has not been further considered here.

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[16] Gough and Ball , 1995

[17] Sandrey, R. 1987. West Coast Visitor Survey. Unpublished Report. Lincoln University.

[18] For example, using the travel costs method to try and measure consumer surplus of users.

3. DESCRIPTION OF WEST COAST ECONOMY

The 2001 census reveals that at that time there were 12,210 FTE jobs in West Coast Region, and that employment in the region had declined by 8 per cent in the preceding 15 years. As in many other peripheral New Zealand regions, there was a decline in several sectors of the economy. Although farming employment did not fall much, there were major declines in forestry (- 25 %), mining (- 46 %), food processing (- 18 %), other manufacturing (- 46 %), electricity (- 85 %), transport (- 16 %), and communications (-82 %). It is clear that the West Coast Region has not only suffered the widespread shocks associated with structural change, but in addition it has suffered from collapses in the mining and forestry sectors.

Table 1 Employment in West Coast Region (FTE)[+] by Sector: 1986 – 2001

Industry	Numbers Employed			Percentage Change	
	1986	1996	2001	1986-1996	1986-2001
Agriculture	1,464	1,425	1,419	- 2.7	- 3.1
Forestry	516	435	387	- 15.7	- 25.0
Hunting and Fishing	123	111	96	- 9.8	- 22.0
Mining	777	615	417	- 20.8	- 46.3
Food Manufacturing	507	540	417	+ 6.5	- 17.8
All Other Manufacturing	1,731	987	933	- 43.0	- 46.1
Electricity, Gas & Water	216	87	33	- 59.7	- 84.7
Construction	1,056	789	807	- 25.3	- 23.6
Wholesale & Retail Trade	1,533	1,632	1,845	+ 6.5	+ 20.4
Restaurants	225	390	423	+ 73.3	+ 88.0
Accommodation	639	615	651	- 3.8	+ 1.9
Transport	675	477	570	- 29.3	- 15.6
Communications	459	108	84	- 76.5	- 81.7
Business & Prof. Services	519	708	759	+ 36.4	+ 46.2
Recreation & Cultural Services	219	222	255	+ 1.4	+ 16.4
Health & Education	1,725	1,434	1,458	- 16.9	- 15.5
All Other Services	843	1,074	1,008	+ 27.4	19.6
Not Identified	72	801	681		
TOTAL	13,287	12,420	12,210	- 6.5	- 8.1

+ Full Time Equivalent.

Employment in forestry, hunting and fishing, mining, food processing, other manufacturing, construction, electricity, transport and communications have all declined rapidly, and there may have been a minor decline in agriculture. By contrast, employment in business and professional services has increased rapidly. Growth in tourism-related industries has also been evident, with retailing (+ 20 %), restaurants (+ 88 %), accommodation (+ 2 %), and recreation and cultural services (+ 16 %) all having grown.

Changes in individual industries will have been distorted by the high numbers for whom their employing industry was not identified, but the general conclusion, that there has been a rapid decline in primary industry employment and a moderate decline in total employment, is robust.

4. THEORY AND RESEARCH METHOD

The objective of this project was to measure the level of economic activity (employment, household income and value added) which is dependent both directly and indirectly on the West Coast Public Conservation Land (PCL). This section describes the general concept of multiplier analysis and the way in which an economic model of the region was developed in order to estimate the wider economic impacts of the PCL. Appendix 1 describes various terms used throughout this section. Multipliers for West Coast tourism have already been generated in earlier research, but these are for Westland District rather than the entire West Coast and initial analysis suggests that multipliers are likely to be significantly different for the two geographic entities. A comparison of Westland District and West Coast Region[19] multipliers has been made, and Westland tourism multipliers[20] were adjusted accordingly to give approximate West Coast multipliers for tourism.

4.1 Principles of Multiplier Analysis

Operation of any business, including DOC itself, generates direct employment, output, and value added. DOC also purchases a range of inputs from other regional businesses which thus increase their income and employment, and these businesses in turn purchase inputs from still more businesses. These "business support" effects are generally termed "indirect" effects. To find out the scale of the indirect effects, one must examine the expenditure patterns of the primary business (e.g. DOC). What does it buy, and from where do the goods and services come (in the region or out of the region)?

As businesses expand, they also employ more labour and increase payments to households. The resultant increase in household expenditure generates further increases in output, value added and employment in the district and regional economy. These additional effects generated by household spending are termed "induced" effects, and their extent depends on the proportion of household spending which is done in the local economy.

The sum of direct, indirect and induced effects is the total effect, and the total effects: direct effects ratio is the “multiplier”.

4.2 Generation of a Regional Economic Model

Data on the likely direct spending patterns of DOC and visitors give only the first round of indirect impacts. To estimate the further impacts caused by the spending of businesses further down the chain, an estimate of the probable pattern of their expenditure was developed on the basis of information that already exists about national average expenditure patterns of businesses of each type and the regional location of businesses that supply those inputs. For example, if it is known that on average 3% of DOC costs is spent on uniforms and there are sufficient clothing factories in

[19] West Coast region includes Westland, Grey and Buller districts.

[20] As assessed by Butcher *et al* (2001)

West Coast for the region to be 50 per cent self-sufficient in clothing, then it has been assumed that 1.5% of DOC inputs are made in the region and a further 1.5% of inputs are imported into the West Coast Region.

The basic regional economic model is generated using an existing national input-output model, information about the regional distribution of employment and output, and a relatively simply mathematical technique called GRIT (Generation of Regional Input-output Tables) which estimates the source of inputs into local industries. This model is then adjusted by incorporating into it information about the likely expenditure patterns of the visitor industry and of DOC. In the case of DOC, employment and operational financials have been provided by DOC. An analysis of each line item was undertaken to ascertain what sort of goods or services it related to and where they were supplied from, and the information was used to create a separate DOC industry within the base economic model. The resultant input-output model can then be used to calculate the total effects on all sectors of an increase in output of any single sector, and in particular to calculate the total effects of DOC and of tourism. These total effects include the original effect and all the consequential rounds of indirect and induced effects.

The locality in which wages and salaries will be spent depends on where staff live. In the DOC case it has been assumed that 100 % of staff will live within the region (due to the distance of the regional offices from centres of population outside the region). Obviously not all household spending will be done locally because of limits to the range of goods and services available and the desire by some members of small communities to use outside professional assistance in order to preserve their privacy. The economic model takes these factors into account. It is estimated that those living in West Coast Region will do 42 % of their spending outside the West Coast Region, including their spending on imports from other countries. Note that for New Zealand as a whole, 10 % of spending is done on goods and services imported from other countries.

4.3 Estimates of Multipliers

Once the DOC expenditure information had been incorporated into the regional model, employment, output, value added and household income multipliers for DOC on the West Coast can be estimated using matrix algebra[21]. Type II multipliers (which include induced effects) were calculated. It is clear that the increased direct household income from DOC operations will stimulate household spending and hence economic activity in the region, and for this reason it seems appropriate to use Type II multipliers to calculate total economic impacts of DOC. The multipliers are applied to DOC's actual direct employment, output, value added and household income in the year to June 2003 to get estimates of total employment, output, value added and household income arising in West Coast Region from the operations of DOC in that year.

West Coast multipliers were also calculated for coal mining and for "other mining" (which

[21] Readers who wish to know more should consult a text on input-output models. Customised software (e.g. IO7) which undertakes the matrix manipulation is readily available.

excludes oil and gas). These multipliers assumed that typical average New Zealand technologies for these industries are used in mining operations on PCL.

5. DIRECT ECONOMIC IMPACTS

This section contains a summary of the estimated direct commercial economic impacts associated with the use of the West Coast Conservancy Public Conservation Land (PCL). The tourism figures in particular can be no more than indicative estimates because of the lack of visitor survey data specifically asking the importance of conservation lands in visitor destination decisions, although related questions have been asked in an earlier study on West Coast tourism[22].

5.1 Department of Conservation

Examination of West Coast Conservancy 2002/03 financial data shows that the department has direct output valued at $12.8 million[23]. This figure includes depreciation of $1.0 million, but because depreciation is not a cash cost it is generally excluded from impact analysis. Discussion with the department suggests that annual capital expenditure, excluding expenditure on land[24], is significant and since this is likely to be on-going expenditure as the department continues to expand its asset base, the associated impacts could arguably be included in the analysis. However, it has not been on the grounds that capital expenditure is volatile and may not occur in future years.

The Department of Conservation employs 135 permanent full time staff and an additional 40 full time staff for about 4 months of the summer season. This is equivalent to 150 permanent full time jobs (FTEs).

Value added is the payments to land, labour and capital owned by the department, and hence is equivalent to wages and salaries, depreciation and profits. This amounted to $7.5 million, including $6.35 million on wages and salaries. It is assumed that the conservancy makes no profit, and that the $1.2 million it gets in hut fees, professional fees for staff time, shop sales and donations plus the $1.3 million it gets in concession fees are offset by the costs of providing and managing these goods and services.

5.2 Concessions

There were in excess of 600 non-mining concessions related to PCL plus a further 147 mining rights either applied for or granted on PCL. Of the mining rights, 55 have Ministry of Economic Development (MED) approval to mine but have not yet applied for DOC approval for access or are in the process of getting approval, and 81 have both MED and access[25] permission, but only

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22 Moore *et al* (2001)

23 A further $3.1 million is the conservancy share of HO/Regional Corporate Costs. Since these are not spent on the West Coast, this figure has been excluded from the analysis.

24 Purchases of land represent a transfer of ownership in exchange for a transfer of cash and do not actually generate any economic impact.

25 In most cases the access has been approved by DOC, but in 12 cases the access appears to be under long-

about 56 of these are active. The status of a further 11 mining concessions is not known. According to MED, only 31 mining rights on PCL land actually involved production during 2003[26].

Table 1 Concessions related to the West Coast (number and revenue)

	Number of Concessions as at June 2003 Conservancy Managing the Concessions			Annual Revenue $ / year (02/03)
	West Coast	Other	Total	
Access	45		45	92,400
Accommodation	56		56	7,300
Extraction (sphagnum moss and one timber)	26		26	0
Filming	1	1	2	8,100
General Agriculture	1		1	
Grazing	159		159	112,600
Structures	5		5	
Telecommunications	24		24	151,400
Unidentified	3		3	
Wild Animal Control	13	33	46	
Tourism				
Access	6		6	200
Accommodation	1		1	200
Aircraft	17	2	19	408,900
Boating	8		8	1,800
Events	1	3	4	0
Guiding	41	167	208	522,400
Structures	1		1	
Vehicles	5		5	200
Total (non-mining)	**413**	**206**	**619**	**$1,305,500***
Mining Concessions				
MED & Access Approved				
Active	58			
Non-Active	23			
MED approved, no access	55			
Status Unknown	11			
Total Mining	**147**	**0**	**147**	**$85,000****

* Excludes $149,000 from sale of a piece of land

** Royalty collected by Ministry of Economic Development

On average the DOC revenue from concessions related to guiding are equivalent to approximately 7.5 % of the amount paid by the client, and the revenue from concessions related to aircraft landings are equivalent to 5 % of the passenger fare. The revenue from

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standing arrangements in place before DOC took over the land.

[26] Some of the other active concessions will have been for exploration rather than production.

grazing concessions is equivalent to an average of about $6 per Stock Unit, and the revenue from moss concessions is equivalent to about $110 per tonne (wet), which is about 12 % of the value. Mining royalties (which accrued to MED and not to DOC) are less than 1 % of the value of production. The implication (seeTable 2) is that the direct output related to these concessions is about $32 million per annum, and that the concessions also support directly 183 jobs and $14.5million of value added (including $6.5 million of gross household income).

Table 2 Direct Economic Activity Related to Concessions

Concession Type	Output ($m / yr)	Value Added ($m / yr)	Household Inc. ($m / yr)	Employment (FTEs)
Guiding	7.0	3.4	2.7	70
Aircraft & other Transport	8.2	3.5	1.1	39
Sporting & Special Events	-	-	-	-
Filming	0.4	0.2	0.1	2
Grazing	1.7	0.8	0.3	9
Telecommunications	0.2	-	-	-
Residential Occupants	0.1	-	-	-
Other Occupations	0.7	-	-	-
Electricity Generation	-	-	-	-
Easements	0.1	-	-	-
Extraction – Sphagnum	3.0	1.5	1.2	45
Mining	10.3	5.1	1.2	19
	31.7	14.5	6.5	183

Note: Output of Telecoms and Easements is assumed to be equivalent to the rental paid to DOC

5.3 Tourism

Moore (2000) undertook a large scale survey of visitors to Westland. The survey objectives included finding out when and how people made destination decisions, but there was no specific question as to which of the various aspects of the West Coast most affected their decision to include Westland in their itinerary. However, there was an open-ended question asking what visitors felt was most important about their West Coast visit, and a closed question asking them to rate various aspects of the West Coast experience. The results are reproduced in Table 3 and Table 4. It is quite clear that various aspects of the natural environment rate as generally being of very high importance, and are what the vast majority of visitors to the West Coast list as being the important attractions of the region. Relatively little mention is made of other things, including the built environment, as being significant attractions, although when prompted visitors rate these things as being moderately important elements of a visit to the West Coast.

The visitor survey focussed on the entire West Coast and there were around 1,200 respondents. Hence the survey should be reasonably representative of visitors to the West Coast region. We assume that business and VFR[27] trips are not dependent on the conservation estate, and although there is no firm data on the proportion of trips which fall into these categories, it is believed to be of the order of 10 - 20 per cent[28].

[27] VFR: Visiting Friends and Relatives

[28] For all international tourism the figure is 27 % but only 19 % of the people surveyed by Moore *et al* mentioned seeing friends / family / peoples as a main attraction of the West Coast, let alone the principal reason.

Table 3 Main Attractions of the West Coast

Responses to the question: *What are the main attractions for you in the West Coast area.?*

	First Mention		Second Mention		Third Mention	
	Number	%	Number	%	Number	%
Nature	427	36.1	359	36.7	199	32.7
Glaciers	295	24.9	125	12.8	47	7.7
Activities	138	11.6	143	14.6	91	15.0
Friends/Family/People	107	9.0	48	4.9	29	4.8
Particular Place	87	7.3	119	12.2	90	14.8
Bush/Coast/Sea	55	4.6	86	8.8	57	9.4
Convenience / Vacation	20	1.7	17	1.7	14	2.3
Cultural / Heritage / History	13	1.1	32	3.3	31	5.1
Other	44	3.7	49	5.0	50	8.2
	1,186	100	978	100	608	100

Source: Table 20 Moore *et al* (2001)

N.B. This was generally an exit survey, so the question is not directly about factors which made the respondents choose to come to the West Coast.

Table 4 Attraction Importance Rating

Responses to the question: *Rank the importance of these features to your party while you were on the West Coast.*

	Importance Rating (from 1 "Important" to 5 "Not so important") Percentages of all people ranking this attraction					Total responses
	1	2	3	4	5	
Scenic Features						
Mountains	68 %	18 %	10 %	3 %	2 %	1,187
Bush	54 %	21 %	16 %	6 %	3 %	1,184
Seashore	49 %	23 %	17 %	7 %	4 %	1,174
Wild Coastlines	57 %	21 %	12 %	5 %	3 %	1,177
Walks						
Bush	44 %	20 %	13 %	8 %	15 %	1,113
Alpine	30 %	16 %	14 %	12 %	28 %	1,073
Overnight	18 %	9 %	12 %	12 %	49 %	1,049
Remote	19 %	13 %	12 %	12 %	45 %	1,042
Short Exploration	45 %	25 %	12 %	6 %	12 %	1,119
Other Attractions						
Museums	17 %	15 %	23 %	13 %	31 %	1,124
Eating Places	21 %	22 %	24 %	14 %	20 %	1,133
Inns and Pubs	14 %	15 %	24 %	18 %	29 %	1,114
Heritage Sites	25 %	24 %	25 %	14 %	13 %	1,128
Nature Sites	54 %	29 %	11 %	2 %	4 %	1,142
Glaciers	57 %	17 %	10 %	4 %	12 %	1,124
Crafts	16 %	17 %	26 %	18 %	22 %	1,113
Enjoyable Driving	41 %	24 %	17 %	6 %	12 %	1,119

Source: Table 21: Moore *et al* (2001)

Note: Percentages add across the line to 100 % (excluding rounding errors)

On the basis of these figures we assume that around 65 % of all holiday visitors' trips to the West

Coast would not occur in the absence of the PCL and the concessions that operate on them. The figure is believed to be conservative and has been adopted in the absence of survey data relating to a more specific question about the factors which determined visits to the West Coast.

Tourism in Westland district in the 2000 year was estimated[29] to directly generate $82 million of output, $44 million of value added including $24 million of household income, and 810 jobs (FTE[30]). Since this time tourism has grown in volume by 31 per cent[31] and probably a further 10 % in value[32], while tourism in Westland district is only 57 % of total West Coast tourism[33]. On this basis we estimate that the total direct impact of tourism in West Coast region is output of $209 million, value added of $112 million including household income of $60 million, and the generation of 1,870 jobs (FTE). If 65 % of tourism is dependent on the PCL, then these lands have direct forward tourism linkages that are equivalent to output of $135 million, value added of $73 million including household income of $39 million and 1,220 jobs (FTE). These direct impacts generate their own backward linkages in the same way as does any other activity (see section 5).

Note that the economic impacts related to tourism concessions are driven by tourism spending and hence are implicitly included in the above impacts, so the tourist impacts other than at DOC concessions become $120 million output, 1,110 jobs and $66 million of added value including $35 million of household income.

4.4 Combined Direct Employment

The direct employment related to DOC operations, tourism concessions on PCL, other economic activity on PCL and tourism which depends on the visitors non-commercial use of PCL is 1,442 jobs including 150 FTEs in DOC, 108 FTEs in commercial tourism concessions on PCL, 1,109 in tourism which depends on non-commercial visitor use of the PCL, and and 75 FTEs in the non-tourism concessions (including mining) on PCL, with the majority of the latter employment being in sphagnum moss collection[34].

4.2 Combined Direct Value Added

The direct value added related to PCL is $88 million including $7.4 million in DOC, $6.9 million in commercial tourism concessions on PCLs, $66 million in tourism which depends on non-commercial visitor use of the PCLs, and and $7.6 million in the non-tourism concessions

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29 Butcher *et al* 2001

30 FTE stands for Full Time Equivalent. A person working half time for half of the year is 0.25 FTEs.

31 From 482,000 visitor nights in Westland District in the year ended December 2000 to 631,000 visitor nights in the year ended December 2003.

32 Assuming an average 3 % per annum increase in prices paid by visitors.

33 Based simply on a comparison of visitor nights in commercial accommodation, which totalled 1,114,000 in West Coast region for the year to December 2003. We would expect a somewhat higher proportion of visitors to Grey and Buller districts to be staying with friends and relatives.

34 The data on sphagnum moss is considered to be extremely unreliable.

(including mining) on PCL.

4.4 Combined Direct Household Income

The direct household income related to PCL is $47 million jobs including $6.4 million in DOC, $3.8 million in commercial tourism concessions on PCL, $35.4 million in tourism which depends on non-commercial visitor use of the PCL, and $2.8 million in the non-tourism concessions (including mining) on PCL.

Table 5 Direct Economic Impacts of DOC Spending and Activities using Public Conservation Lands

	Direct Output ($m/year)	Direct Value Added ($m/year)	Direct Household Income ($m/year)	Direct Jobs (FTEs)
DOC Conservancy Activity	12.8	7.4	6.4	150
DoC Visitor Concessions	15.2	6.9	3.8	108
Other Visitor Spending by Visitors dependent on PCL	120.3	65.8	35.4	1,109
Other Commercial Activity on PCL	16.5	7.6	2.8	75
TOTAL DIRECT	**164.8**	**87.7**	**48.3**	**1,442**

5. MULTIPLIERS AND TOTAL PCL ECONOMIC IMPACTS

5.1 Estimates of Multipliers and Total Impacts

Once the basic regional models had been expanded to incorporate the expenditure and employment estimates for DOC, it was possible to calculate employment, output, value added and household income multipliers for DOC. Tourism Multipliers were based on multipliers estimated in earlier work[35] on tourism. However, these multipliers were calculated for Westland District only, which has a considerably narrower economic base than does West Coast region as a whole. A comparison of Westland and West Coast multipliers for typical tourist industries (accommodation, retail, passenger transport etc) suggests that the flow-on impacts in the larger region will be significantly greater than in the smaller region, and for this reason we have adjusted the original Westland district multipliers. The derived multipliers have been applied to the direct impacts shown in Table 5 in order to estimate the total impacts as shown below in Table 6. While the multipliers were derived at a very disaggregated level, the results are presented below only in an aggregated form. More detailed results are contained in Appendix 2.

Table 6 Total Economic Impacts on West Coast Region of Commercial Activity associated with DOC and the Public Conservation Lands

	Total Output ($m/year)	Total Value Added ($m/year)	Total Earned* Household Income ($m/year)	Total Jobs (FTEs)
DOC Conservancy Activity	21.4	11.3	8.2	209
DoC Visitor Concessions	23.6	11.5	6.3	173
Other Visitor Spending by Visitors dependent on PCL	155.9	84.8	44.3	1,283
Other Commercial Activity on PCL	20.7	10.2	3.4	149
TOTAL ALL ACTIVITIES	**221.6**	**117.7**	**62.1**	**1,814**
Total West Coast Region	2,175	980	480	12,321
DOC and PCL as % of region	**10.2 %**	**12.0 %**	**12.9 %**	**14.7 %**

* Earned household income includes income of self-employed, but excludes transfers such as welfare benefits

5.3 The Economic Impacts dependent on DOC and the Public Conservation Lands, and their significance in the West Coast Context

The inclusion of flow on effects means it is expected that the operations of DOC and the use of Public Conservation Lands will generate output of $222 million, Value added of $118 million (including $62 million of household income), and 1,814 jobs. This indicates that the conservation lands support something like 12 % of regional value added, 13 % of regional earned household

[35] Butcher *et al*, 2001

income, and 15 % of regional employment (see Table 6).

6. FURTHER WORK

This work has established the approximate level of economic activity on the West Coast which depends on, or is undertaken on, the conservation estate. The results could be significantly affected by any revisions to the estimates of the proportion of tourism which is dependent on the existence of the Public Conservation Lands. The estimates used in this report are based on research which, while shedding considerable light on the topic, was trying to answer different questions. Hence the results are not as robust as we would like.

Estimates of the value of sphagnum moss are very approximate and could possibly be improved. However, this will be difficult given the fragmented nature of the industry and the expected unwillingness of the industry to provide reliable data.

To improve the estimates of the economic impacts associated with agriculture would also probably cost of the order of $2,000 – $3,000, and would best be done by an agricultural economist with some understanding of, or access to information about, the Westland livestock industry. Given the small proportion of activity related to grazing leases this work is probably not worthwhile, except to inform any debate about the level of impacts if grazing leases are withdrawn to improve conservation outcomes.

The largest changes to economic impacts associated with PCL are likely to arise from changes to the assumptions about the proportion of visitor spending which is dependent on the existence and use of PCL. The assumptions could be made more reliable and supportable by undertaking a survey of visitors[36] to identify how likely they would have been to come to the West Coast if they had not been able to use the conservation lands. Survey work is generally expensive, and this work would probably cost of the order of $10 – 30,000 depending on the length of the questionnaire needed to get reliable answers and the number of responses which were deemed necessary to get a statistically reliable sample.

[36] David Palmer has done an M.Com. Thesis (Otago 1995) called *Visitor Satisfaction: A methodology for determining the reasons for visitation and the influence of environmental factors on visitor satisfaction.*

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APPENDIX 1 DEFINITIONS

Employment

Employment is work done by employees and self-employed persons, and is measured in Full-Time-Equivalent jobs (FTEs). A person working part time all year is deemed to be equivalent to 0.5 FTEs. Where work is seasonal, the conversion to FTEs is based on 12 months work per year. So a seasonal worker working full time for six months per year is 0.5 FTEs, and a part time seasonal worker working ten hours per week for 4 months is 0.1 FTEs.

Output

Output is the value of sales by a business. In the case of wholesale and retail trade, it is the total value of turnover (and not simply gross margins) [37].

Value Added

Value added includes household income (wages and salaries and self-employed income), and returns to capital (including interest, depreciation and profits). It also includes all taxes. Put another way, Value Added is equal to Output less costs other than wages, salaries, depreciation and interest.

Household Income

Household income is the gross income of households. It includes the income of self-employed persons. There is sometimes considerable uncertainty as to the proportion of business income which goes to households, especially for small businesses. In assessing this proportion, dividends and interest payments have been excluded. Conceptually they should be included, but it is difficult to be clear what proportions have gone to households. When estimating indirect economic impacts, one needs to know the increase in household income which occurs in the region. Where owners of business capital live out of the district, shares and interest do not form part of the district household income.

Direct Economic Impacts

The direct impact arises from the initial spending by DOC on goods and services they purchase in order to operate. The direct employment is of people who work for DOC. The direct output is the value of production. The direct value added is the value added in DOC itself.

Indirect Economic Impacts

The indirect impact arises from increased spending by businesses as they buy additional inputs so that they can increase production to meet visitor demand. This indirect effect can be envisaged as an expanding ripple effect. For example, DOC buys food and drink for staff at a cafe. The cafe has to employ more staff and buy more bread, so the bakery output expands. The bakery has to employ more staff and buy more electricity, so the power company increases its output. The

37 Care has to be taken in combining retail sales figures with employment per $million of output from input - output tables. In these tables, output is generally defined as gross margin. By contrast, business statistics figures usually give employment per $million of turnover.

power company has to increase its maintenance, so it employs another person and spends more on a vehicle for that person. All the increased employment, output and value added (apart from that at DOC) are the indirect effect.

Note that indirect effects only include "upstream" effects (via buying more inputs), but do not include any stimulated development downstream. If, for example, DOC attracts tourists and hence leads to an expansion of restaurants and accommodation in the area, the extra activity is not included as a flow on effect of DOC and hence is not included in the multiplier.

Induced Economic Impact

The induced impact is the result of increased household income being spent, and leading to a further ripple effect of increased employment, output and income.

Flow on Effects / Upstream Impacts

The sum of indirect and induced effects is sometimes termed the flow on effects, or upstream impacts.

Downstream Impacts

Impacts which are not driven by an activity's demand for extra inputs, but which might arise as a result of a particular activity, are sometimes called the "Downstream impacts". An example would be where DOC attracts visitors, who then purchase food and accommodation in the area. The accommodation and food is not an input into DOC and hence is not an indirect or induced effect of DOC operations. It is a downstream effect.

Total Economic Impacts

The total Type I impact is the sum of the direct and indirect impacts, and a Type II impact is the sum of direct, indirect and induced impacts.

Multipliers

A Type I multiplier is the ratio of (direct + indirect) impacts to direct impacts, and a type II multiplier is the ratio of (direct + indirect + induced) impacts to direct impacts. The Type II multipliers include the impact of household spending and hence will always be greater than a Type I multiplier. Both multipliers will always be greater than 1. Note that downstream effects (whether positive or negative) are not included in the multiplier, and must be calculated separately.