Decision released from confidential session			
Recommendation from (agenda report)	**Date of meeting**	**Recommendation to (decision-making meeting)**	**Date of meeting**
Commercial Subcommittee	31 March 2016		
Report Title and number			
Forestry (R5472)			
Documents released			
Attachment A1416796 – Alan Bell and Associates Review of Nelson City Council Plantations 29 August 2015 and Attachment A1432701 - PF Olsen Ltd Response to Alan Bell and Associates Review of Plantations Report			
Decision			
N/A			

Nelson City Council

Review of Plantations

29 August 2015

On Behalf Of:
Nelson City Council

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29 August 2015

Review of Nelson City Council Forestry.

Table of Contents

Maitai forest, Compartment 4.

1. Summary and Recommendations.

A review of the Nelson City Council exotic plantations (NCC forests) has been completed on behalf of the Nelson City Council as at August 2015 as requested by Mr Dean Evans, Manager Environmental Programmes.

Field inspections were completed on 14-16 August 2015 and documention from the current forest managers, P F Olsen & Co Ltd were offered and perused as part of this review. A significant amount of useful historical information was passed on by PFO staff member David Fincham. PFO have been very helpful and forthcoming in providing information and field trip guidance.

A generic analysis showed that NCC radiata plantations are capable of an internal rate of return (IRR) of around 6% (real, before tax) and that an unpruned tending regime gives higher IRR (as opposed to a pruned regime).

The value of the existing NCC forests for insurance purposes is estimated to be $5.7 million as reported by PFO. The review found that most of the very young stands were undervalued by PFO and did not cover replacement value.

The market value reported by PFO was $5.12 million and this was confirmed by an independent check that gave an estimate of $4.96 million. However, it was found that the PFO crop market value for Maitai forest was likely to be optimistic due to higher logging costs that will be associated with stands close to the Maitai Stream and county road. The review found that yields based on forest inventory at Roding gave higher values than PFO had predicted. (PFO had used a generic yield table for some stands.)

A simplistic cashflow model was developed for the NCC estate based on a strategic plan as to future management of each forest stand. This cashflow model included costs and revenues up to 2048. The present value of this cashflow stream before tax and using 8% discount rate was $3.96 million. This showed that the NCC forest estate has a long term positive outlook. The cashflow assumed that forest overheads would be reasonably efficient at $100/ha per year. The cashflows show that there will be significant net revenue from harvesting over the next decade followed by a 12 year period during which there will be annual losses. At around 2036, harvest revenues will again be significant.

The review found that NCC needs to retain forest land for many reasons including water supply, recreation, infrastructure and utilities and water and soil protection. Using this land in multiple use with production forestry allows NCC to gain some tangible profit from long term ownership.

Looking ahead to the next rotation it is recommended that out of 166 ha at Maitai, only 129 be re-established with plantation species. At Roding all areas except 8.5 ha are recommended for ongoing plantation. Similarly at Marsden Valley all stands are expected to be harvested and re-established (in plantations) except for 5.2 ha of macrocarpa that may not be harvestable due to access issues. Brook forest was found to have no stands that are suitable for ongoing plantations once the existing crop has been harvested. This is due to their being too close to existing infrastructure and residential zones and/or lack of suitable access.

The current management structure for NCC forests needs to be revised to ensure clear lines of communication exist and to ensure that health and safety is maximised. This could involve a change in structure. Regardless of the management structure, an annual forest audit by a suitably qualified independent forest company should be undertaken with emphasis on health and safety and harvest costs and returns.

It is recommended that the NCC forests be removed from the ETS to avoid future liabilities and ongoing ETS costs.

Consideration should be given to tendering NCC mature forest on a contestable basis in an open market situation.

2. The Nelson CC Forests (briefly).

Maitai.

Maitai forest contains approximately 166 ha of plantations (Radiata and Douglas-fir). There are 14 ha of mature stands that are either unable to be harvested or can only be harvested with significant disruption to the public road. The largest over-mature stand, (1.01) contains 8.9 ha of 1981 radiata pine but also contains the Smith Grave site.

Maitai contains 117 ha of semi-mature stands planted between 1987 and 1995 that are coming up for harvest between 2017 and 2024.

There are 25 ha that were replanted in 2011 following harvesting.

It is recommended that some of the older stands be left to grow as protection forests because they are too difficult to harvest safely and profitably being close to the public road and/or immediately above the Maitai Stream and with no current access. Several stands that are located on accessible land are recommended to remain as plantation.

Harvesting at Maitai is further complicated by the presence of the water supply pipeline.

The Maitai water supply dam with Douglas-fir stand 10.01 on the right.

Roding.

Roding forest contains 151 ha of plantations including 125 ha planted between 1988 and 1993 that will be ready for harvest during the period 2016 to 2021. The forest has a solid roading network although the ford across the Roding Stream does present a barrier in wet weather.

Roding forest has been affected by windthrow in past years and some salvage operations have been carried out. The forest is used for water supply and there are strict conditions around the use of herbicides.

It is recommended that Roding forest remain as a production forest.

Harvesting at Roding forest, July 2014.

Marsden Valley.

Marsden Valley forest contains 133 ha of plantations including 20 ha of Douglas-fir that is growing on elevated slopes. Harvesting of 26 ha occurred in 2013 and replanting was completed in winter 2014.

The 24 ha of 1994 plantings are scheduled for harvest in 2022 and the 1997 radiata (50 ha) are expected to be harvested in 2025.

There is no harvest revenue expected until 2022.

The forest contains a good access road that will be used for harvesting of the 1994 and 1997 crops.

Marsden is relatively "unencumbered" although it is popular for walking and cycling and there is a launch site at the top.

It is recommended that Marsden forest continue as a production forest.

Brook and York Valley.

Brook forest contains approximately 126 ha of mostly radiata pine. The largest stand is expected to be harvested during 2015 but will not be replanted with exotics. Brook contains many small stands that are located close to city and suburban housing with associated challenges to carrying out normal production forest operations. It is recommended that all stands in Brook revert to natural forest to avoid future problems. This may involve harvesting of the existing crop or in some cases leaving the existing crop in situ.

Brook stands have also suffered significant wind damage over the past 2-3 years.

Stands in York Valley are associated with landfill and have also been affected by wind.

The largest of the Brook stands are located in the Tantragee block. There are 11 ha planted in 2013 and 34 ha planted in 2014 following harvesting by the previous owner. The purchase of this block does not appear to have been appraised in terms of suitability for forestry. Ownership of this block appears to be extending further the issues of forestry adjacent to housing development. Normal forest investors would not put money into such blocks.

3. Economics of NCC forests (IRR).

Analyses of internal rate of return (IRR) for unpruned and pruned radiata pine regimes using inputs relevant to NCC suggest that an unpruned regime of radiata pine can yield an IRR of 6% (real) and that a pruned regime would yield an IRR of 5.4%. Further, pruned log prices would need to rise to around $180/m3 in order to achieve an IRR of 6%.

So as a general statement, forestry in Nelson is capable of returning an IRR of 5 to 6% and is therefore a reasonable long term investment, especially for land that has very limited alternative economic use. Further, under current and past long term (3-year averages) log prices for radiata pine the highest return on investment is from a tending regime that does not involve pruning.

The IRR or return on investment (ROI) will be affected by extraordinary constraints that may be imposed on forestry operations. For example, the effect of the spraying consent within the water supply catchments will reduce the ROI because the cost of establishment will be higher. However, that is simply the compromise for ensuring other land uses (such as water collection) are not jeopardised by the forestry operations.

4. Why an unpruned regime?

As indicated above the IRR from an unpruned regime is higher than that from a pruned. In addition to this fundamental economic reason there are other advantages to an unpruned regime.

An unpruned regime is more flexible in terms of harvest age. This makes it more likely that losses arising from pre-mature harvesting will be less such as when salvage operations occur following windthrow.

An unpruned regime requires less upfront investment and less management input and felling age is not as critical as that for a pruned regime.

There are plenty of markets for unpruned sawlogs at local mills and for export logs.

The relatively modest growth rates and small branching characteristics of the forests make them suited to production of unpruned structural sawlogs.

5. Why should NCC be in forestry?

NCC owns land that is suitable for plantation forestry but which also has significant non-timber values and as such should remain in council ownership.

NCC is committed to providing for the long term health and well-being of its residents. Ownership of forests and land that have multiple uses is needed to satisfy those goals.

Being a forest owner on its own land allows NCC to manage its forestry assets to ensure all values are safeguarded whilst also allowing a modest return on investment from timber production.

NCC has invested in significant infrastructure (roading) in the past and continued ownership of the forests with limited wood production will allow NCC to reap the benefits from this earlier investment.

With appropriate "rules of engagement", NCC can provide a wide range of benefits from forest ownership. Owning its own forests allows NCC to incorporate specific constraints that are necessary for reasons of multiple use (such as the aerial spraying restrictions within water supply catchments).

NCC needs to own land in and around Nelson for various reasons including water supply, recreation and landscape. Certain portions of this land are suitable for exotic forestry. It is timely to review the options for NCC forest land.

In this report "forest" or "forest land" refers to land or forest that is primarily exotic plantation rather than large tracts of natural vegetation.

NCC forestry enables land that would otherwise be in noxious weeds to be productive.

6. Rationalising NCC forests.

It is timely to review the future of the NCC forests. As the city expands and housing moves closer to the forests, normal forestry becomes difficult, costly and health and safety may be compromised. Similarly, new initiatives such as the Brook Waimarama Sanctuary change the suitability of forestry as an adjacent land use. Most forests in the Brook group are located in less than ideal situations, in terms of forest efficiency and health and safety of both forest workers and the general public.

The high value placed on recreational pursuits such as walking and cycling by Nelson residents must be acknowledged in forest operations even if it means that forestry returns are reduced. Reduced returns result from higher costs of supervision during harvesting operations, spreading of harvest areas to reduce impact (reduction in scale) and re-instatement of trails following harvesting. It is in the long term interests of all concerned to endeavour to keep the forests safe for everyone. Management of forest operations should allow for heavy public use and should aim to keep the public "on side".

7. Value of NCC forests.

The NCC forests were valued as at 30 June 2015 by P F Olsen and Co in a report by Erin Leahy dated 22 June 2015.

The reported tree crop market value of the NCC estate was $5.120 million plus GST if any.

The reported insurance value (as at 30 June 2016) was $5.702 million.

During the review an independent check of the values has been completed and the results are shown in the table below.

	PFO Crop Market value	PFO Crop Insurance Value	Review Market Value (9%)	Review Value of Future Cashflows to 2048 (8%)
Brook	$ 784,992	$ 882,704	$ 726,830	$ 566,194
Maitai	$ 2,209,003	$ 2,438,639	$ 1,531,984	$ 1,226,371
Marsden	$ 683,264	$ 759,749	$ 742,574	$ 615,435
Roding	$ 1,443,689	$ 1,621,153	$ 1,959,992	$ 1,552,122
	$ 5,120,948	$ 5,702,245	$ 4,961,380	$ 3,960,122

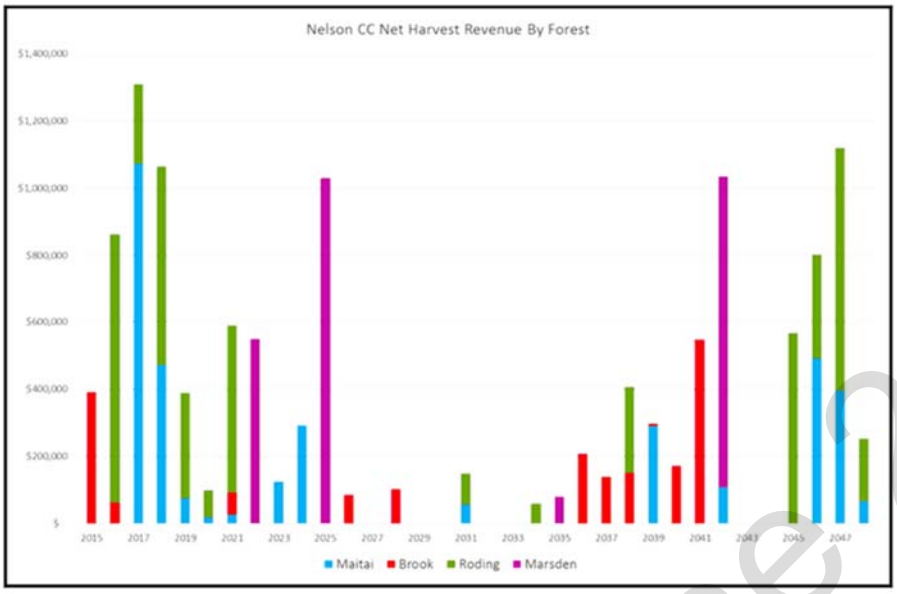
The values are similar overall in magnitude at least. Differences between the PFO values and the reviewed values are most significant at Maitai and Roding.
The PFO market analysis for Maitai may not be taking into account the major difficulties and high costs associated with harvesting in this forest and hence the PFO market value is significantly higher.
In both Roding and Marsden the review market value used yield tables that were based on forest inventory that PFO had undertaken. In some cases this gave higher yields than the generic yields used by PFO across their generalised crop types. The review value for young stands is based on investment to date. In the PFO valuation a similar approach was taken apparently but several stands had values that were less than the cost to replant them ie the value would not cover replacement cost. This situation was passed on to the Rotorua-based PFO valuer and it is understood that the erroneous values will be corrected (or may have already been). This suggests that the valuation was not checked by the local Nelson PFO staff and it is recommended that in future, this be carried out to ensure the values do reflect the local conditions.

When comparing the value of future cashflows to value of crop it is important to realise that the former includes cost of the next rotation whereas, by definition, the value of tree crop only includes the existing crop. The ongoing cashflows reflect the reality of the situation.

8. Cashflows over time.

Harvest Revenue.
The table below shows indicative expected net revenue from harvesting over the next 33 years. Net revenue from harvesting does not allow for re-establishment or future tending etc. The values in the table are displayed in the chart below. Log prices used are based on long term averages.

The chart below shows possible net harvest revenue by forest.



As can be seen in the chart above, revenue from harvesting is expected to be significant during 2015 through to 2025 followed by 12 years of minimal revenue. Note that it would be possible to spread the harvest in a more regular fashion during 2017 to 2026 if required.

The water pipeline in Brook forest following windthrow salvage in July 2014.

Table showing indicative harvest revenue by forest.

Year Begin 1 July	Net Harvest Revenue - Maitai	Net Harvest Revenue - Brook	Net Harvest Revenue - Roding	Net Harvest Revenue - Marsden	Net Harvest Revenue Total
	Maitai	Brook	Roding	Marsden	
2015	$ -	$ 391,549	$ -	$ -	$ 391,549
2016	$ -	$ 63,817	$ 799,822	$ -	$ 863,640
2017	$ 1,073,250	$ -	$ 235,249	$ -	$ 1,308,499
2018	$ 472,190	$ -	$ 593,118	$ -	$ 1,065,308
2019	$ 75,571	$ -	$ 312,863	$ -	$ 388,434
2020	$ 17,713	$ -	$ 81,539	$ -	$ 99,253
2021	$ 27,512	$ 64,384	$ 496,590	$ -	$ 588,486
2022	$ -	$ -	$ -	$ 549,243	$ 549,243
2023	$ 124,525	$ -	$ -	$ -	$ 124,525
2024	$ 293,163	$ -	$ -	$ -	$ 293,163
2025	$ -	$ -	$ -	$ 1,030,247	$ 1,030,247
2026	$ -	$ 84,872	$ -	$ -	$ 84,872
2027	$ -	$ -	$ -	$ -	$ -
2028	$ -	$ 103,687	$ -	$ -	$ 103,687
2029	$ -	$ -	$ -	$ -	$ -
2030	$ -	$ -	$ -	$ -	$ -
2031	$ 55,577	$ -	$ 94,412	$ -	$ 149,989
2032	$ -	$ -	$ -	$ -	$ -
2033	$ -	$ -	$ -	$ -	$ -
2034	$ -	$ -	$ 60,229	$ -	$ 60,229
2035	$ -	$ -	$ -	$ 79,868	$ 79,868
2036	$ -	$ 207,769	$ -	$ -	$ 207,769
2037	$ -	$ 138,513	$ -	$ -	$ 138,513
2038	$ -	$ 151,179	$ 254,289	$ -	$ 405,468
2039	$ 291,458	$ 7,048	$ -	$ -	$ 298,506
2040	$ -	$ 171,130	$ -	$ -	$ 171,130
2041	$ -	$ 546,978	$ -	$ -	$ 546,978
2042	$ 108,628	$ -	$ -	$ 927,162	$ 1,035,790
2043	$ -	$ -	$ -	$ -	$ -
2044	$ -	$ -	$ -	$ -	$ -
2045	$ -	$ -	$ 565,950	$ -	$ 565,950
2046	$ 490,500	$ -	$ 311,850	$ -	$ 802,350
2047	$ 396,000	$ -	$ 724,350	$ -	$ 1,120,350
2048	$ 67,500	$ -	$ 184,800	$ -	$ 252,300

Both Roding and Maitai have significant short term harvest revenue over the next decade.

Forest Costs.

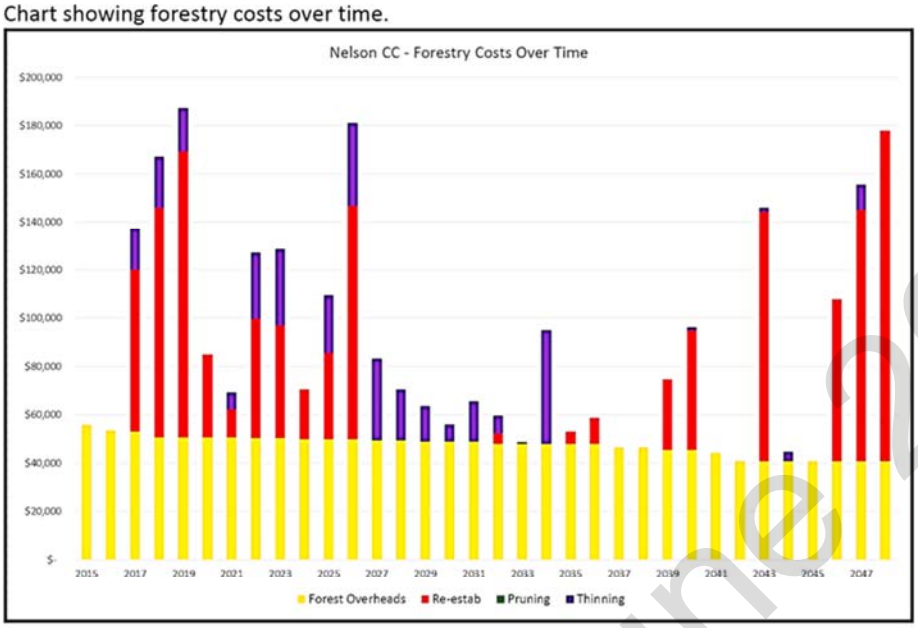
The table and chart below show the cost stream associated with the ongoing management of the forests. The re-establishment and tending costs are in line with the harvesting strategy shown above.

Table showing ongoing forestry costs.

Year	Forest Overheads	Re-estab	Pruning	Thinning	Total Cost
2015	$ 55,700	$ -	$ -	$ -	$ 55,700
2016	$ 53,700	$ -	$ -	$ -	$ 53,700
2017	$ 53,190	$ 66,885	$ -	$ 17,220	$ 137,295
2018	$ 50,740	$ 95,355	$ -	$ 21,000	$ 167,095
2019	$ 50,740	$ 118,755	$ -	$ 17,710	$ 187,205
2020	$ 50,740	$ 34,125	$ -	$ -	$ 84,865
2021	$ 50,740	$ 11,310	$ -	$ 7,280	$ 69,330
2022	$ 50,390	$ 49,335	$ -	$ 27,370	$ 127,095
2023	$ 50,390	$ 46,605	$ -	$ 31,640	$ 128,635
2024	$ 49,930	$ 20,670	$ -	$ -	$ 70,600
2025	$ 49,790	$ 35,685	$ -	$ 24,010	$ 109,485
2026	$ 49,790	$ 97,110	$ -	$ 34,230	$ 181,130
2027	$ 49,450	$ -	$ -	$ 33,880	$ 83,330
2028	$ 49,450	$ -	$ -	$ 21,000	$ 70,450
2029	$ 48,870	$ -	$ -	$ 14,700	$ 63,570
2030	$ 48,870	$ -	$ -	$ 7,070	$ 55,940
2031	$ 48,870	$ -	$ -	$ 16,730	$ 65,600
2032	$ 48,020	$ 4,290	$ -	$ 7,420	$ 59,730
2033	$ 48,020	$ -	$ -	$ 630	$ 48,650
2034	$ 48,020	$ -	$ -	$ 47,040	$ 95,060
2035	$ 48,020	$ 5,070	$ -	$ -	$ 53,090
2036	$ 48,020	$ 10,725	$ -	$ -	$ 58,745
2037	$ 46,520	$ -	$ -	$ -	$ 46,520
2038	$ 46,520	$ -	$ -	$ -	$ 46,520
2039	$ 45,420	$ 29,250	$ -	$ -	$ 74,670
2040	$ 45,420	$ 49,335	$ -	$ 1,540	$ 96,295
2041	$ 44,350	$ -	$ -	$ -	$ 44,350
2042	$ 40,930	$ -	$ -	$ -	$ 40,930
2043	$ 40,930	$ 103,350	$ -	$ 1,820	$ 146,100
2044	$ 40,930	$ -	$ -	$ 3,850	$ 44,780
2045	$ 40,930	$ -	$ -	$ -	$ 40,930
2046	$ 40,930	$ 66,885	$ -	$ -	$ 107,815
2047	$ 40,930	$ 104,130	$ -	$ 10,500	$ 155,560
2048	$ 40,930	$ 137,085	$ -	$ -	$ 178,015

Note that the overheads column is based on $100/ha/year of stocked production forest.

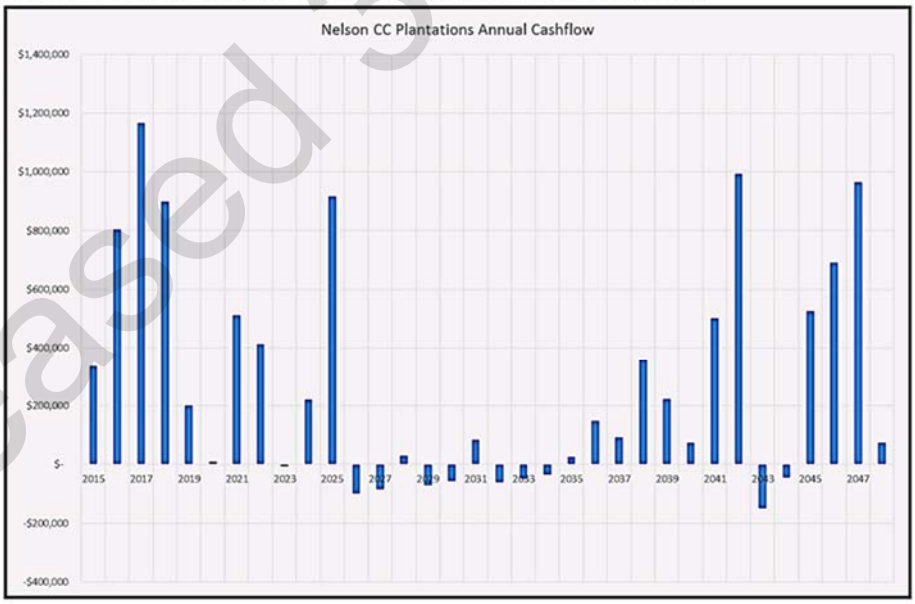
Chart showing forestry costs over time.



The overhead costs reduce because over time the forest area is reducing as certain stands are not replanted and are left to revert to natural vegetation.
The re-establishment costs follow the pattern of harvesting. This costing scenario assumes all future forests are treated on an unpruned regime involving one thinning at age 8.

Overall Cashflows.

The chart below shows the harvest revenue and forest costs combined.



The overall cashflows presented in the chart above and in the table below show that there is a 12 year period from 2026 to 2037 when cashflow is negative. This means that some of the net revenue from 2015 to 2025 will need to be retained to cover ongoing costs over the following decade.

Table showing ongoing cashflows for Nelson CC plantations.

																		8%
																		$ 3,960,122
Nelson CC Plantations																		
	Year Begin 1 July	Net Harvest Revenue	Area Cut (ha)	Land Prep	Plant	Release	Boron	Prune 1	Prune 2	CW Thin	Struct Thin	Overheads	Loan Costs	Other Costs	Net Cash
	2015	$ 391,549	20.0	$ -	$ -	$ -	$ -	$-	$-	$-	$ -	$ 55,700	$ -	$ -	$ 335,849
	2016	$ 863,640	39.4	$ -	$ -	$ -	$ 5,130	$-	$-	$-	$ -	$ 53,700	$ -	$ -	$ 804,810
	2017	$ 1,308,499	73.4	$ 27,440	$ 27,440	$ 12,005	$ 4,260	$-	$-	$-	$ 17,220	$ 53,190	$ -	$ -	$ 1,166,944
	2018	$ 1,065,308	60.9	$ 39,120	$ 39,120	$ 17,115	$ -	$-	$-	$-	$ 21,000	$ 50,740	$ -	$ -	$ 898,213
	2019	$ 388,434	17.5	$ 48,720	$ 48,720	$ 21,315	$ -	$-	$-	$-	$ 17,710	$ 50,740	$ -	$ -	$ 201,229
	2020	$ 99,253	5.8	$ 14,000	$ 14,000	$ 6,125	$ 5,145	$-	$-	$-	$ -	$ 50,740	$ -	$ -	$ 9,243
	2021	$ 588,486	28.8	$ 4,640	$ 4,640	$ 2,030	$ 7,335	$-	$-	$-	$ 7,280	$ 50,740	$ -	$ -	$ 511,821
	2022	$ 549,243	23.9	$ 20,240	$ 20,240	$ 8,855	$ 9,135	$-	$-	$-	$ 27,370	$ 50,390	$ -	$ -	$ 413,013
	2023	$ 124,525	15.2	$ 19,120	$ 19,120	$ 8,365	$ 2,625	$-	$-	$-	$ 31,640	$ 50,390	$ -	-$	$ 6,735
	2024	$ 293,163	19.7	$ 8,480	$ 8,480	$ 3,710	$ 870	$-	$-	$-	$ -	$ 49,930	$ -	$ -	$ 221,693
	2025	$ 1,080,247	49.8	$ 14,640	$ 14,640	$ 6,405	$ 3,795	$-	$-	$-	$ 24,010	$ 49,790	$ -	$ -	$ 916,967
	2026	$ 84,872	3.4	$ 39,840	$ 39,840	$ 17,430	$ 3,585	$-	$-	$-	$ 34,230	$ 49,790	$ -	-$	$ 99,843
	2027	$ -	-	$ -	$ -	$ -	$ 1,590	$-	$-	$-	$ 33,880	$ 49,450	$ -	$ -	-$	$ 84,920
	2028	$ 103,687	5.8	$ -	$ -	$ -	$ 2,745	$-	$-	$-	$ 21,000	$ 49,450	$ -	$ -	$ 30,492
	2029	$ -	-	$ -	$ -	$ -	$ 7,470	$-	$-	$-	$ 14,700	$ 48,870	$ -	$ -	-$	$ 71,040
	2030	$ -	-	$ -	$ -	$ -	$ -	$-	$-	$-	$ 7,070	$ 48,870	$ -	$ -	-$	$ 55,940
	2031	$ 149,989	10.7	$ -	$ -	$ -	$ -	$-	$-	$-	$ 16,730	$ 48,870	$ -	$ -	-$	$ 84,389
	2032	$ -	-	$ 1,760	$ 1,760	$ 770	$ -	$-	$-	$-	$ 7,420	$ 48,020	$ -	$ -	-$	$ 59,730
	2033	$ -	-	$ -	$ -	$ -	$ -	$-	$-	$-	$ 630	$ 48,020	$ -	$ -	-$	$ 48,650
	2034	$ 60,229	2.6	$ -	$ -	$ -	$ -	$-	$-	$-	$ 47,040	$ 48,020	$ -	$ -	-$	$ 34,831
	2035	$ 79,868	5.5	$ 2,080	$ 2,080	$ 910	$ 330	$-	$-	$-	$ -	$ 48,020	$ -	$ -	$ 26,448
	2036	$ 207,769	15.0	$ 4,400	$ 4,400	$ 1,925	$ -	$-	$-	$-	$ -	$ 48,020	$ -	$ -	$ 149,024
	2037	$ 138,513	10.0	$ -	$ -	$ -	$ -	$-	$-	$-	$ -	$ 46,520	$ -	$ -	$ 91,993
	2038	$ 405,468	26.0	$ -	$ -	$ -	$ 390	$-	$-	$-	$ -	$ 46,520	$ -	$ -	$ 358,558
	2039	$ 298,506	25.7	$ 12,000	$ 12,000	$ 5,250	$ 825	$-	$-	$-	$ -	$ 45,420	$ -	$ -	$ 223,011
	2040	$ 171,130	10.7	$ 20,240	$ 20,240	$ 8,855	$ -	$-	$-	$-	$ 1,540	$ 45,420	$ -	$ -	$ 74,835
	2041	$ 545,978	34.2	$ -	$ -	$ -	$ -	$-	$-	$-	$ -	$ 44,350	$ -	$ -	$ 502,628
	2042	$ 1,035,790	53.0	$ -	$ -	$ -	$ 2,250	$-	$-	$-	$ -	$ 40,930	$ -	$ -	$ 992,610
	2043	$ -	-	$ 42,400	$ 42,400	$ 18,550	$ 2,295	$-	$-	$-	$ 1,820	$ 40,930	$ -	$ -	-$	$ 148,395
	2044	$ -	-	$ -	$ -	$ -	$ -	$-	$-	$-	$ 3,850	$ 40,930	$ -	$ -	-$	$ 44,780
	2045	$ 565,950	34.3	$ -	$ -	$ -	$ -	$-	$-	$-	$ -	$ 40,930	$ -	$ -	$ 525,020
	2046	$ 802,350	53.4	$ 27,440	$ 27,440	$ 12,005	$ 4,260	$-	$-	$-	$ -	$ 40,930	$ -	$ -	$ 690,275
	2047	$ 1,120,350	70.3	$ 42,720	$ 42,720	$ 18,690	$ -	$-	$-	$-	$ 10,500	$ 40,930	$ -	$ -	$ 964,790
	2048	$ 252,300	15.7	$ 56,240	$ 56,240	$ 24,605	$ -	$-	$-	$-	$ -	$ 40,930	$ -	$ -	$ 74,285

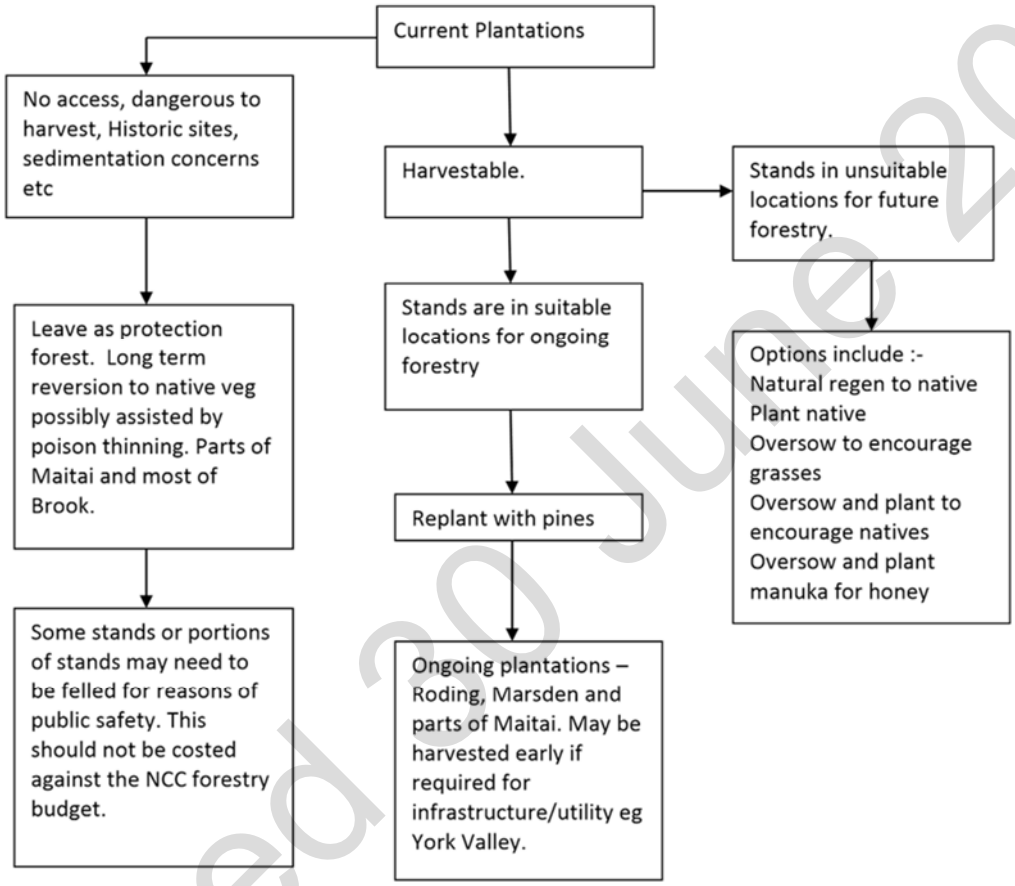
9. Future management by stand.

There are a number of options for future management of the NCC plantations. In general the Maitai, Roding and Marsden forests should continue as plantation forests but with some exceptions in Maitai where the current crop should either be left as protection forest or be harvested (cleared) and then allowed to revert to native vegetation (with or without assistance).

Most of the stands in the Brook forest should eventually become native vegetation to avoid ongoing problems in the future. This is because of the danger and difficulties associated with carrying out production forestry in close proximity to residential land.

The table below shows details and possible future management for each stand in each forest. This analysis is based on field inspections during 14-16 July 2015 plus previous inspections at Roding and Brook in relation to windthrow salvage operations. In addition there have been useful discussions with PFO staff some of whom have been working in the forests for over 20 years.

The options for future management are simplistically presented in the diagram below.



There is a need to rationalise the NCC forests into the following groups:-

Normal forestry – ongoing plantations – primary objective is to grow healthy forests for commercial return within the constraints of health and safety and environmental values.

Protection forest – exotic stands with no commercial value that should be left as protection forest. These stands could be poison thinned to promote long term native understory. Mature pines are valuable habitat for many native birds. In a number of cases harvesting is likely to cause more damage to neighbouring lands so it would be preferable to allow the pines to remain.

Amenity and/or unsuitable for commercial forestry – primary objective to provide recreational values for the local population – replant as native following harvest of current crop. Possibly lease for honey where appropriate and promote recreational values. If unable to be harvested safely investigate poison thinning to allow undergrowth to develop gradually.

Holding for infrastructure – likely to be harvested early pending land-use change or in some cases never to be harvested unless trees become dangerous – primary objective is to hold for infrastructure use. Investment in silviculture in such stands may be unwise.

York Valley 26.06 may be harvested early for landfill.

10. Stand by stand details and recommended future strategy.
Maitai Forest.

1.01 – over-mature stand of 8.9 ha on very steep slopes above the Maitai valley road and stream. Access is complicated by the Smith Grave site. Harvest revenue has been included for 2017 but the reality is that this stand may never be harvested.
1.02 and 1.03 – located on steep faces above the Maitai stream. Only access is from Hancock forests. Recommended to harvest using Hancock roads and then allow these areas to revert to native vegetation.
1.04 – mature stand above Maitai stream and road – will be difficult to harvest whole stand. Replant/revert to native or leave as is.
2.01 – small area of poor trees, leave as protection forest.
2.03 – 4.6 ha of elevated 1995 – harvest in 2023 then allow to revert to native.
2.04 – 15.3 ha significant area harvested and replanted in 2011 with access road in place, continue as ongoing plantation – unpruned regime.
3.01 and 3.02 – small mature stands in difficult location – leave as protection forest.
3.03 – 5.4 ha of 1988 – harvest in 2017 and continue as unpruned regime.
3.04 – 10.5 ha of 1995 harvest in 2023 and continue as unpruned regime.
3.05 – 10.0 ha harvested and replanted in 2011 with access road in place, continue as ongoing plantation – unpruned regime.
4.03 – small area of mature in difficult location – leave as is.
4.04 – 1986 D fir – harvest in 2031, replant to radiata.
4.05 – 26.4 ha of 1988 radiata harvest in 2018 replant into unpruned radiata.
4.08 – small area of wattle – leave as is.
4.11 – 17.4 ha of 1995 radiata harvest in 2024 and replant to unpruned regime.

4.12 – 0.9 ha of 1993 rad harvest in 2024 replant to unpruned regime.
5.01 – scattered 1995 rad, salvage/harvest when/if possible, aloe to revert to native.
5.02 – as for 5.01 (1992 rad).
7.02 – 0.9 ha 1993 near road – log in 2021, replant to unpruned regime.
8.02 – 3.6 ha of 1991 rad harvest in 2019 and replant to unpruned regime.
9.01 - 4.3 ha D fir harvest in 2042 and replant to D fir.
9.03 – 0.6 ha 1989 rad across stream – harvest if possible then leave to native reversion.
9.04 – 2 ha 1989 rad harvest in 2017 and replant to unpruned regime.
10.01 – 1.8 ha D fir leave as is (above lake)
10.02 – 1.9 ha 1992 rad harvest in 2020 or when fits with Hancock operations, replant to unpruned regime.
10.03 – 17.3 ha 1987 rad harvest in 2017 and replant to unpruned regime.

Brook 22.02 has no access and will not be harvested.

Marsden Forest.
42.05 – 23.9 ha 1994 Rad harvest in 2022 and replant to unpruned regime.
42.06 – 20.3 ha 1997 D fir harvest in 2042 and replant to D fir.
42.07 - 49.8 ha 1997 Rad harvest in 2025 replant to unpruned regime.
42.08 – 5.2 ha Macrocarpa will be difficult to access, leave and harvest when 2nd rotation of adjacent radiata is harvested (2052).
42.10 – 5.5 ha 2007 Rad harvest in 2035 replant to unpruned regime.
42.11 – 28.4 ha 2014 Rad harvest in 2042 replant to unpruned regime.

Roding Forest.
51.01 - 4.5 ha 1990 Rad harvest in 2018 replant to unpruned regime.
51.02 – 13.5 ha 1991 Rad harvest in 2019 replant to unpruned regime.
51.03 – 3.9 ha 1992 Rad harvest in 2020 replant to unpruned regime.
52.02 – 24.1 ha 1990 Rad harvest in 2018 replant to unpruned regime.
52.04 – 6.4 ha 1989 Rad harvest in 2017 replant to unpruned regime.
53.01 – 1.0 ha 1989 Rad harvest in 2017 replant to unpruned regime.
53.02 – 3.3 ha 1990 Rad harvest in 2018 replant to unpruned regime.
53.04 – 7.0 ha 1989 Rad harvest in 2017 replant to unpruned regime.
54.02 – 8.5 ha 2003 Rad regen, harvest in 2031, revert to native.
55.01 – 7.3 ha 1993 Rad harvest in 2021 replant to unpruned regime.
55.02 – 34.3 ha 1988 Rad harvest in 2016 replant to unpruned regime.

55.04 – 2.2 ha 1990 Rad harvest in 2018 replant to unpruned regime.
55.06 – 0.4 ha 1991 Rad harvest in 2019 replant to unpruned regime.
56.01 – 17.1 ha 1993 Rad harvest in 2021 replant to unpruned regime.
56.04 - 0.4 ha 1990 Rad harvest in 2018 replant to unpruned regime.
56.05 – 2.6 ha 2006 Rad harvest in 2034 replant to unpruned regime.
56.07 – 15.0 ha 2010 Rad harvest in 2038 replant to unpruned regime.

Brook Forest.
21.04 – 20.0 ha 1986 Rad harvest in 2015, revert to native.
22.05 – 1.6 ha 1987 Rad harvest in 2016, revert to native.
22.06 – 3.5 ha 1988 Rad harvest in 2016, revert to native.
22.09 – 11.0 ha of 2011 Rad harvest in 2038, revert to native.
22.02 – 3.0 ha of 1981 Rad with no access, leave as protection forest.
22.08 – 3.4 ha of 1981 D fir, harvest in 2026, revert to native.
22.03 – 5.8 ha of 1983 D fir, fell in 2028, revert to native.
25.01 – 2.5 ha of 1994 macrocarpa, wind damaged, leave as protection forest.
26.01 – 1.9 ha of 1994 macrocarpa, buffer for landfill, leave as protection forest.
26.02 – 0.5? ha remnant Rad, leave as protection forest.
26.05 – 15 ha (approx.) of 2009 Rad, wind damaged, harvest in 2036, or when needed for landfill.
26.06 – 10 ha 2010 Rad, wind damaged, harvest in 2037 or when needed for landfill.
26.07 – 0.4 ha 2012 Rad, harvest in 2039 or when needed for landfill.
28.01 – above College 3.0 ha 1993 Rad, fell in 2021, revert to native.
29.01 – 10.7 ha 2013 Rad, fell in 2040, revert to native.
29.02 – 34.2 ha 2014 Rad, fell in 2041, revert to native.
29.03? Tantragee remnant, mature trees left behind by previous owner on very dangerous site above houses. Clear for safety reason but will be expensive operation. Replant to native.

Brook 28.01 College Block 1993 Radiata – visible from the centre of Nelson City.

The table below includes stand by stands details for each forest and the possible future strategy as outlined above.

Forest	Stand	Species	Nsa (ha)	Avg Age	Indicative Value	Year	Comments	Harvest Year	Replant to?	Future Regime
Maitai	1.01	P.rad	8.9	34	$ 117,671	1981	Smith Grave site	2017??	Native Regen	n/a
Maitai	1.02	P.rad	6.4	26	$ 90,295	1989	Access from Hancock	2017	Native Regen	n/a
Maitai	1.03	P.rad	7.5	25	$ 94,975	1990	0	2017	Native Regen	n/a
Maitai	1.04	P.rad	1.1	30	$ 10,745	1985	50% too hard	2017 Part	Native Regen	n/a
Maitai	2.01	P.rad	0.3	34		1981	Small area, poor trees	No fell	Leave as is	n/a
Maitai	2.02							No fell	Leave as is	n/a
Maitai	2.03	P.rad	4.6	20	$ 12,627	1995	Poor, exposed	2023	Native Regen	n/a
Maitai	2.04	P.rad	15.3	4	$ 41,483	2011	0	2039	Radiata	Unpruned
Maitai	3.01	P.rad	1.2	33		1982	Small area, poor trees	No fell	Leave as is	n/a
Maitai	3.02	P.rad	2.3	29		1986	Above river	No fell	Leave as is	n/a
Maitai	3.03	P.rad	5.4	27	$ 26,101	1988	0	2017	Radiata	Unpruned
Maitai	3.04	P.rad	10.6	20	$ 35,465	1995	Water pipeline	2023	Radiata	Unpruned
Maitai	3.05	P.rad	10	4	$ 23,230	2011	0	2039	Radiata	Unpruned
Maitai	4.03	P.rad	0.5	32		1983	Above river	No fell	Leave as is	n/a
Maitai	4.04	Psmen	2.2	29	$ 11,028	1986	0	2031	Radiata	Unpruned
Maitai	4.05	P.rad	26.4	27	$ 351,100	1988	Water pipeline	2018	Radiata	Unpruned
Maitai	4.08	Aamel	1.3	20	nil	1995		No fell	Leave as is	n/a
Maitai	4.11	P.rad	17.4	20	$ 100,253	1995	Water pipeline	2024	Radiata	Unpruned
Maitai	4.12	P.rad	0.9	22	$ 4,392	1993	0	2024	Radiata	Unpruned
Maitai	5.01	P.rad	1.4	20	$ -	1995	Scattered, wind damaged	Salvage	Native Regen	n/a
Maitai	5.02	P.rad	0.5	23	$ -	1992	Difficult	Salvage	Native Regen	n/a
Maitai	7.02	P.rad	0.9	22	$ 10,243	1993	Tidy, near road	2021	Radiata	Unpruned
Maitai	8.02	P.rad	3.6	24	$ 51,323	1991	0	2019	Radiata	Unpruned
Maitai	9.01	Psmen	4.3	18	$ 814	1997	0	2042	Douglas-fir	Unpruned
Maitai	9.02	P.rad	9.8	28	$ 158,125	1987	0	2017	Radiata	Unpruned
Maitai	9.03	P.rad	0.6	26	$ 9,258	1989	Across stream	2017	Native Regen	n/a
Maitai	9.04	P.rad	2	26	$ 32,626	1989	0	2017	Radiata	Unpruned
Maitai	10.01	Psmen	1.8	18	$ 130	1997	0	No fell	Leave as is	Unpruned
Maitai	10.02	P.rad	1.9	23	$ 10,165	1992	Via Hancock	2020	Radiata	Unpruned
Maitai	10.03	P.rad	17.3	28	$ 339,931	1987	0	2017	Radiata	Unpruned
Marsden	42.05	P.rad	23.9	21	$ 279,548	1994	Clearwood CT4	2022	Radiata	Unpruned
Marsden	42.06	Psmen	20.3	18	$ 4,033	1997	0	2042	Douglas-fir	Unpruned
Marsden	42.07	P.rad	49.8	18	$ 381,625	1997	0	2025	Radiata	Prune
Marsden	42.08	Cumac	5.2	18		1997	Access difficult	No fell	Leave as is	n/a
Marsden	42.10	P.rad	5.5	8	$ 18,044	2007	0	2035	Radiata	Unpruned
Marsden	42.11	P.rad	28.4	1	$ 58,819	2014	0	2042	Radiata	Unpruned
Roding	51.01	P.rad	4.5	25	$ 52,611	1990	0	2018	Radiata	Unpruned
Roding	51.02	P.rad	13.5	24	$ 208,537	1991	0	2019	Radiata	Unpruned
Roding	51.03	P.rad	3.9	23	$ 50,230	1992	0	2020	Radiata	Unpruned
Roding	52.02	P.rad	24.1	25	$ 312,330	1990	0	2018	Radiata	Unpruned
Roding	52.04	P.rad	6.4	26	$ 53,669	1989	0	2017	Radiata	Unpruned
Roding	53.01	P.rad	1	26	$ 12,408	1989	0	2017	Radiata	Unpruned
Roding	53.02	P.rad	3.3	25	$ 42,685	1990	0	2018	Radiata	Unpruned
Roding	53.04	P.rad	7	26	$ 126,166	1989	0	2017	Radiata	Unpruned
Roding	54.02	P.rad	8.5	12	$ 12,302	2003	Regen, Thinned	2031	Native Regen	n/a
Roding	55.01	P.rad	7.3	22	$ 52,979	1993	Framing	2021	Radiata	Unpruned
Roding	55.02	P.rad	34.3	27	$ 724,246	1988	0	2016	Radiata	Unpruned
Roding	55.04	P.rad	2.2	25	$ 27,673	1990	0	2018	Radiata	Unpruned
Roding	55.06	P.rad	0.4	24	$ 4,558	1991	0	2019	Radiata	Unpruned
Roding	56.01	P.rad	17.1	22	$ 223,713	1993	Framing	2021	Radiata	Unpruned
Roding	56.04	P.rad	0.4	25	$ 5,031	1990	0	2018	Radiata	Unpruned
Roding	56.05	P.rad	2.6	9	$ 12,788	2006	0	2034	Radiata	Unpruned
Roding	56.07	P.rad	15	5	$ 38,066	2010	0	2038	Radiata	Unpruned
Brook	21.04	P.rad	20	29	$ 388,649	1986	Brook Sanctuary	2015	Native Regen	n/a
Brook	22.05	P.rad	1.6	28	$ 19,026	1987	0	2016	Native Regen	n/a
Brook	22.06	P.rad	3.5	27	$ 38,103	1988	0	2016	Native Regen	n/a
Brook	22.09	P.rad	11	4	$ 29,825	2011	0	2038	Native Regen	n/a
Brook	22.02	P.rad	3	34	n/a	1981	No Access	No fell	Leave as is	n/a
Brook	22.08	Psmen	3.4	34	$ 29,043	1981	0	2026	Native Regen	n/a
Brook	22.03	Psmen	5.8	32	$ 26,683	1983	0	2028	Native Regen	n/a
Brook	25.01	Cumac	2.5	21		1994	Wind damaged, scattered	No fell	Leave as is	n/a
Brook	26.01	Cumac	1.9	21		1994	Landfill Buffer	No fell	Leave as is	n/a
Brook	26.02	P.rad	.5?	28			Remnant	No fell	Leave as is	n/a
Brook	26.05	P.rad	15	6	$ 38,066	2009	0	2036	Landfill	n/a
Brook	26.06	P.rad	10	5	$ 25,377	2010	0	2037	Landfill	n/a
Brook	26.07	P.rad	0.4	3	$ 846	2012	0	2039	Landfill	n/a
Brook	28.01	P.rad	3	22	$ 36,004	1993	Above College	2021	Native Regen	n/a
Brook	29.01	P.rad	10.7	2	$ 24,377	2013	Tantragee	2040	Native Regen	n/a
Brook	29.02	P.rad	34.2	1	$ 70,832	2014	0	2041	Native Regen	n/a
			577.0		$4,960,874					

11. Communication between NCC and forest manager.

Recent events have highlighted a need to ensure there are clear lines of communication between Nelson CC as forest owners and the PFO as forest contractor.

Stand 21/04 in the Brook forest represents a significant source of income for the Council (in the order of $300,000 net revenue) being around 20 ha of mature pruned radiata pine.

Harvesting was scheduled in 21/04 by PFO to occur in late 2015. However, to fit in with work at the adjacent Brook Waimarama sanctuary, harvesting was brought forward so that the trees would be harvested in July/August ahead of the construction of the final section of predator-proof fence. A considerable amount of pre-planning had been undertaken for this operation by PFO and it was included in the budget for 2015/16.

Having managed to rearrange the harvest crew and to develop a safe harvest plan, the operation was further stalled because Nelson CC felt that there had not been sufficient consultation and further meetings would be needed to approve this work.

This situation appears to have arisen partly through an article in the local newspaper that suggested the harvest operation would result in heavy use of suburban streets by logging trucks.

While it is understood that public consultation is necessary, it is equally important to ensure that harvest operations are planned ahead and that the planned schedule is maintained. PFO were endeavouring to place the wood in local markets as much as possible and scheduling is critical. Further, in the new climate of health and safety in the forest industry, every effort must be made to ensure the safety of all concerned. In this respect PFO had secured a contractor with a hauler and falcon claw. This reduces the need for men to be amongst the cutover when logs are being hauled back and is a much safer operation.

It is difficult for forest management to be efficient and to maximise returns in a safe manner if scheduled work programmes are affected by unexpected holdups.

The situation demonstrates a lack of understanding of the need to carefully manage forestry operations to ensure;

- Health and safety of the general public
- Health and safety of forest workers
- Maintenance of skills and capability in forest contractors (not using the on/off switch approach)
- Environmentally positive outcomes.
- Where practical, realisation of potential profit.

While the current management plan identifies Mr Lindsay Barber as the prime contact between Nelson CC and PFO (the current forest managers) recent events associated with harvesting of Brook 21.04 have shown that when controversial issues arise, the normal lines of communication may break down. In such situations it is important that both forest owner and forest manager are fully informed and that communication is both ways and timely.

Forestry is long term and harvest planning in particular must be taken extremely seriously. This is critical in order to maximise health and safety and to ensure least damage to the environment. It is no longer sufficient to simply say that the forests shall be managed to maximise returns.

The health and safety of forest workers and the general public must be top priority for forest owners with environmental outcomes and sustainability next on the list.

Once these are taken care of then the objective of maximising revenue can come into play.

The idea of harvesting when export prices are high, for example, is no longer an option even if it were a practical one. Harvesting must be planned ahead along with associated roading. Harvest crews need continuity of work in order to facilitate sufficiently high standards of safety. Further, in order to secure supply into local mills, customers need to have confidence that they will be supplied certain quantities at certain times of the year. The local Nelson mills pay export-equivalent (or better) prices for logs but they need to be assured of supply and quality.

PFO are promoting the use of the Falcon Claw which reduces the need for men on steep forests as the claw grabs the logs by itself. This avoids the need for men to be amongst fallen logs on steep hills when they are being hauled back to the skid. Similarly the use of tethered machines on steep slopes is also being promoted. This is where a felling machine is tethered to a winch and is used to fell and bunch stems on steep hills, again avoiding the need for men in this situation.

These initiatives need to be encouraged. There needs to be agreement on the long term (1-2 year) plan and budget and then the forest manager should be allowed to get on with the job. Of course the forest manager needs to keep the forest owner informed along the way, especially ahead of any unplanned changes in approach.

12. Avoiding conflicts of interest in current management.

The current management setup is that PFO carry out all forestry functions including harvesting, marketing, replanting, tending, annual budgeting, financial reporting, forest inventory, forest valuation, casual management requests as well as any one-off reviews such as the Economic Evaluation of Potential Harvest Areas (26 January 2015).

There are no independent checks on the harvesting and marketing operation. For example if PFO had a financial interest in the harvest crew this could lead to a conflict of interest whereby harvest costs might be higher to ensure there was an adequate return on their investment in machinery.

Of course the forest owner benefits from a healthy relationship between PFO and the harvesting crew as this facilitates timely harvesting and promotes health and safety.

Although they are interested in what PFO are doing, the current NCC forestry staff have limited experience in forest operations and are unlikely to be able to discern whether or not PFO (or the current forest manager) are carrying out their duties to a high standard or not. This in itself could leave NCC liable from a health and safety point of view, given that NCC is indeed in the "business of forestry".

This leads into the area of forest auditing. It is recommended that NCC implement an annual audit of operations with particular emphasis on health and safety in relation to harvesting.

A further method that could be employed to ensure that harvesting is giving maximum benefit back to NCC would be to make all significant harvesting operations "contestable" ie call for tenders/proposals for certain stands or groups of stands are ready for harvest. An obvious project for tender is the 150 ha (approx.) of radiata that will be harvestable at Roding over the next 6-7 years.

There are a number of reputable harvesting and marketing companies in the Nelson area and there is plenty of competition for this work.

13. Management Structures of other Councils and small owners.

Palmerston North CC – owns approximately 400 ha of radiata pine forest. Two PNCC staff are members of the NZ Institute of Forestry and are involved with their forestry operations but not full time. All work is carried out by contractors but there is no overall management contractor involved. The 2

staff members liaise with contractors separately as required. There is no annual management fee required and therefore a saving of around $60,000 per year compared to Nelson CC.
At PNCC, harvesting is currently contracted to John Turkington Ltd, forest valuation and inventory work is carried out by a registered forestry consultant and tending is completed by a local silvicultural contractor. PNCC has health and safety policies and seminars that all contractors must attend in order to be fit for contract.
It is understood that PNCC have paid off their forestry encouragement loans.

Wanganui DC – owns 1,140 ha of mostly radiata pine and has no forestry staff. However, they have a consultant (Ian Moore, MNZIF) who has previous experience in their forests who effectively manages contractors on an "as required" basis. There is no monthly fee and all operations are carried out on contract. WDC are likely to announce a sale of their forests this year. Forest valuations are carried out by a registered forestry consultant.

Both PNCC and WDC forestry operations are effective and profitable.

Hawkes Bay DC – own approx. 1200 ha. They have a dedicated forest planner plus all operations are managed by PFO in a similar way to NCC.

Tararua DC – all operations managed by PFO. Minimal in-house forestry expertise.

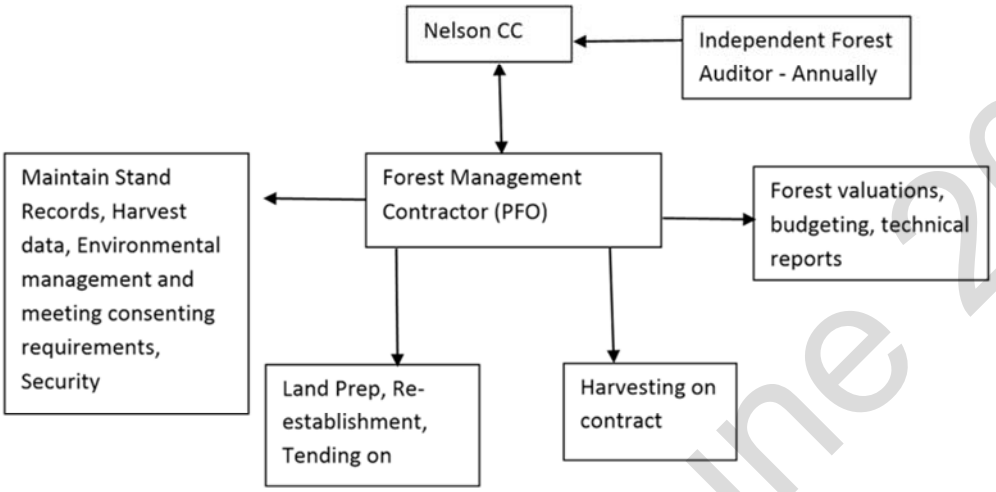
GWRC – previously had 5 full-time staff with all work being carried out on contract but no overall management contract. Around 4,000 ha total exotic forest. Last year GWRC sold their forests on a 60 year cutting right basis.

Anglican Schools owned approx. 3,000 ha in the Wairarapa. They had a full-time forest manager who carried out quality control but all forestry work including harvesting was carried out on contract. Forest valuations were carried out by an independent registered forestry consultant. Last year these forests were sold to an overseas company.

Rangitikei DC own around 150 ha. RDC have no forestry staff but use contractors as required. Their main harvest contractor (JTL) assists with advice when required.

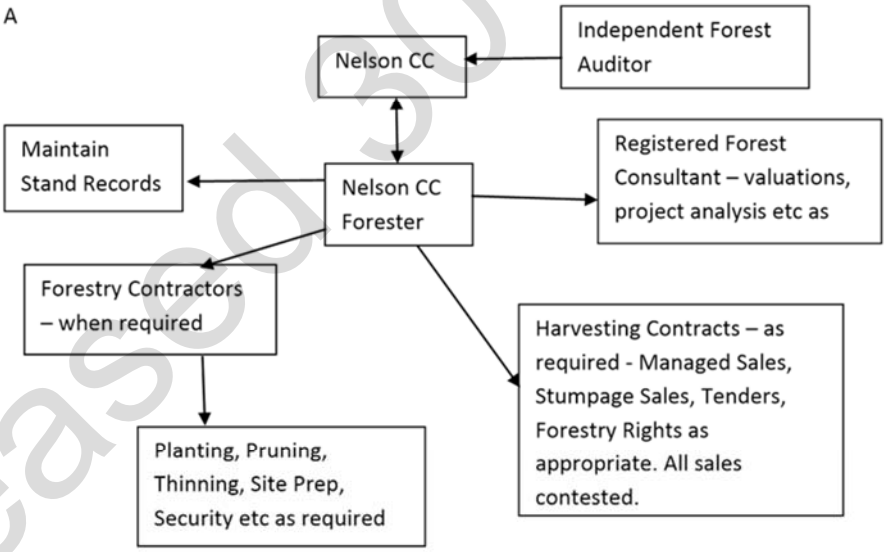
Brook windthrow and breakage in early 2014.

14. Current Management Structure – NCC Forests.



15. Possible Alternative Management Structures

A



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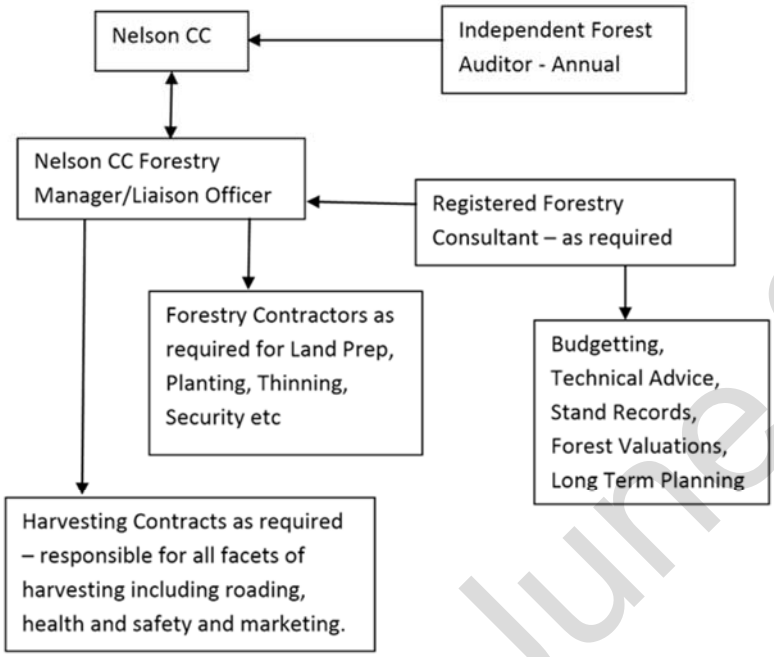

16. Emissions Trading Scheme (Forestry in the ETS).
Post-1989.

The table below shows the stands that have been registered for the Post 1989 voluntary ETS scheme. It is understood that while these stands have been registered and measured for the ETS, at this stage no Carbon units (NZU's) have been sold from them.

The Post-1989 stands are mostly quite old in terms of the ETS and do not contain significant amounts of safe carbon (ie carbon that can be sold and never has to be surrendered at harvest). This means that any carbon sold from these stands will need to be paid back (surrendered) after harvesting, even if they are replanted. So there is minimal benefit from having these stands registered as the carbon being sequestered cannot be sold without creating risk. This risk arises from the possibility that the carbon price will rise in real terms between when they are sold and when they must be paid back. Further, there are ongoing costs of re-measuring the carbon plots that are required for registrants that have more than 100 ha in the scheme.

There is further risk from fire and wind events in which case NCC will have to surrender the carbon lost.

Nelson CC Forest Stands that are registered for Post 1989 ETS Scheme.

Forest	CPT	Stand	Spp	YOE	Ha
Maitai	8	2	P.rad	1991	3.6
Maitai	7	2	P.rad	1993	0.9
Maitai	5	2	P.rad	1992	0.5
Maitai	5	1	P.rad	1995	1.4
Maitai	3	4	P.rad	1995	10.6
Maitai	2	3	P.rad	1995	4.6
Maitai	1	3	P.rad	1990	7.5
Marsden	42	5	P.rad	1994	29.0
Marsden	42	7	P.rad	1997	49.8
Marsden	42	8	C.mac	1997	5.2
					113.1

Pre-1990 credits.
It is unclear whether or not NCC has sold its allocation of Pre-1990 NZU's. If not then it would be worth waiting longer until demand and price increase over time. Prices have increased during 2015 to around $7 but it is reasonable to expect further increases over the next 2-3 years if the ETS carries on and emitters are brought in line.

17. Avoiding fluctuations in harvest revenue.
The most volatile factor determining harvest revenue is log prices. However it is futile to try to predict how log prices will change over time. And unless the forest is already roaded and ready to harvest and there is a harvest crew available, it is impossible to successfully "pick the market".
The most rewarding long term strategy is to develop a schedule of harvest over time so that this can be factored into harvest contractor availability and local mill demand. In this way everyone knows what is coming up. This includes the public and any important stakeholders.
In the new climate of health and safety for forest operations it is critical to plan ahead and to ensure all parties know what will happen and how it will be carried out.
In summary it is not practical or safe to manage forest harvesting on an on/off basis. Rather, the most rewarding strategy will be to harvest a certain quantity of forest each year on a known schedule. In this way there is more chance of achieving long term average revenue as there will be times when you strike the highs and there will be times when you strike the lows. It is no longer acceptable practice to expect harvest contractors to respond to short term price increase or decreases.

18. Alternative mechanisms for harvesting forests.
There are many ways to sell forests with harvesting and marketing companies keen to secure wood either in log form and/or standing. However, most companies will bid only for unencumbered forests or portions thereof. They are risk averse and they know the potential issues around, for example, harvesting in and around suburbs. Methods of sale include;

- Sale of forestry rights
- Managed sale (open book)
- Sale of land and trees.

- Sale of standing trees (stumpage sale) – reduced risk of costs increasing, reduced risk of low prices – sell on basis of long term averages, reduced risk through health and safety.

The Roding block contains approx. 150 ha of 1988-1993 radiata pine that would be suitable for a one-off forestry right/sale of existing trees. The advantages of a sale of forestry rights is that NCC would receive payment for the trees upfront and the price would be based on long term average log prices. This would then remove the risk of logging during periods of low log prices as that risk would pass to the forestry right holder. Obviously there would be some trade-off because the forestry right buyer would apply a discount to allow for the risks associated with predicting yield and for log price variability.

Separating forest management from forest harvesting and marketing would assist;

- Accountability
- Independence
- Remove potential conflict of interest
- Enhance returns through competitive tenders
- Shift the risk to an independent forest/log/stumpage buyer

19. Initiatives/Action points for NCC.

- Familiarisation tour for Nelson CC senior management to see at first hand the forests and issues therein.
- De-register the Post-1989 forests and handback the appropriate NZU's.
- Initiate peer review from local consultant/s as required.
- Implement annual audit of forestry operations by an appropriate registered forestry consulting firm eg Forme.
- Review costs of insurance as they appear to be high in comparison with other forests.
- Sell maturing stands at Roding on an open market basis (tender).

20. Risks.

1. **Health and Safety.**
   It is no longer adequate to simply rely on a management contractor. NCC needs to be involved and demonstrate that it is taking steps to ensure its contractors are maintaining a high standard of health and safety.
   Health and Safety Plan.

2. **ETS.**
   Risk from increase in value of NZU's if NCC sells Post 1989 units. Risk from wind and fire events – currently carbon is not insured. Should de-register immediately.

3. **Environmental.**
   Spraying. Riparian. Sediment post-harvest. Diseases and pests. Rain events.

4. **Recreational.**
   Increasing demand. Population increasing and using natural areas more and more. Brook-Waimarama sanctuary – need to make the most of existing natural areas and supplement them. Need to educate the public about forest operations that assist NCC to cover some costs of recreation.

5. **Fire and Wind.**
   Crop loss.
   Carbon loss.
   Fire Plan.
   Insurance.

6. **Water supply pipelines.**
   Careful consideration during harvesting.

7. **Powerlines.**
   Constraint during harvesting.
   Can cause fires.
   Public liability.

8. **Insurance.**
   Fire, wind, Carbon.

21. Performance of current forest manager.

The current forest manager P F Olsen and Co have a district office in Richmond with backup from Rotorua. Forest valuations are completed in Rotorua. PFO are a large NZ forest management company and have comprehensive systems and procedures in place for environmental and health and safety performance.

PFO have invested in harvesting initiatives aimed at making logging safer and more efficient. Time has been spent consulting with local interests.

Local PFO staff vary in their knowledge of the NCC estate. David Fincham has over 20 years' of experience with NCC forests and was involved when the first rotation stands were harvested during the 1990's. The current branch manager in Nelson, Brendan Horrell, has spent much less time in the area but appears very capable and is committed to managing the NCC forest for best overall return.

Several items of minor concern have appeared during this review;

- Harvest scheduling of the estate appears to be inconsistent with wood availability. For example the current plan includes only 5 ha of harvesting in 2017.
- Costs – insurance costs appear to be relatively high.
- Valuation – lacking local detail and not being peer reviewed – mistakes not being picked up. Eg incorrect crop typing, values not covering replacement value.
- Stand Records – in place but some operations not updated eg 2012 wind damage not in records.

22. Forest efficiency.

There are a number of initiatives that can be used to minimise costs and maximise returns for any forestry operation. It is vital that ongoing costs are not allowed to creep up as the forests will not be providing any net revenue during the period 2026 to 2034. The following are worth noting here;

- Keep overheads down.
- Review insurance costs.
- Be more aware of costs of requests to forest managers.
- Develop in-house expertise (NCC) and/or local peer review.
- Harvest suitable blocks faster.
- Look at forestry right for Roding.

- Use contractors directly rather than use a forest management company – would require a full-time staff position or assistance from suitably qualified forest professional.

23. Advantages of exotic forestry for NCC.

- Allows use of land for economic return that would otherwise not be earning.
- Allows multiple use of land – long rotations facilitate wildlife and recreation use during the growing phase tracks and roads can be used by people when harvesting is not occurring.
- Provides soil and water conservation values.
- Supplements adjoining indigenous forests – habitat, biodiversity.
- Allows for certain uses where indigenous forest is not suitable eg 4WD.
- Allows NCC to take advantage of the existing infrastructure and opportunities provided by the vibrant forest industry in the Nelson/Marlborough region.
- May enhance carbon sequestration objectives of NCC.
- Growth is reasonable and trees have good form and branching in general.
- The forests are very close to a variety of local and export markets including Port of Nelson and Nelson Pine Industries.
- Nelson forests have an enviable position in having a nearby outlet for low grade (chip) logs.
- Climate and soils are generally suitable for radiata pine and Douglas-fir.
- There is a variety of forest companies and contract managers in the area including Tasman Forest Management, P F Olsen & Co, Nelson Forests Ltd, Hancock Forest Management.
- There are several options for management of Nelson CC forests.

24. Disadvantages of exotic forestry for NCC.

- Possible spread of wildings into indigenous vegetation – already in place now so not worth worrying about?
- Recreational use must be managed and there is risk and cost associated with public use.
- The forest must be managed in order to ensure safety and to ensure returns are as expected.
- Harvesting phase is unpleasant and unsightly to the general public.
- Some parcels of land are unsuitable for exotic forestry for reasons such as; too close to built-up areas, no suitable access for log extraction, altitude too high and/or exposed, being too small to allow economies of scale, being associated with sensitive Council infrastructure eg water pipes.

25. Challenges of the NCC forests for timber production include the following;

- Several are in close proximity to Nelson suburbs with associated high landscape and recreational values
- They are generally on steep slopes that require cable-based log extraction with high logging costs and significant roading costs.
- Roading to and within the forests requires significant earthworks on steep land with river and stream crossings frequent.
- County roads to the forests are narrow and winding with significant non-forestry use.
- The forests contain heavy weed presence that hinders re-establishment of both exotic and native plant species.

- Whilst close to markets, cartage of logs from the forests involves logging trucks negotiating narrow winding roads as well as suburban streets.
- Both Maitai and Roding forests provide water for Nelson and have high recreational and biodiversity values.
- Marsden forest contains mountain bike trails and a hang-gliding launch pad.
- Brook forest stand 21/04 is adjacent to the developing Brook Waimarama bird sanctuary.
- Nelson CC has self-imposed restrictions on aerial spraying operations that prevent normal re-establishment of plantation species.
- Local population has a heightened interest in forestry operations, particularly the dramatic (but temporary) effects of harvesting.
- York forest is associated with landfill operations and the current crop may need to be harvested early in order to extend the present landfill.
- Brook forest contains city infrastructure and has heavy use for mountain biking and walking.
- Several of the Nelson CC plantations are located on land that was purchased for recreational purposes and the existing plantations were acquired without specific economic analysis. In fact some portions of these forests could be considered liabilities rather than an assets (eg Tantragee block).
- Unlike forests owned by some other Councils (eg Palmerston North CC), Nelson CC forests are intimately associated with the city population and infrastructure.
- To an outsider, Nelson CC appears to lack empathy with the production side of forestry and the forests appear over-burdened by self-imposed rules and regulations. Examples of this are the restricted use of aerial spraying and certain herbicides in parts of the forests that adds extra cost to re-establishment operations, the purchase of the Tantragee and College blocks that have issues from being in close proximity to residential areas, the location and sensitivity around water piplelines in Maitai and the Brook that increase costs of harvesting, the need to maintain public access and to be seen to be doing so, the high concern and awareness of the negative aspects of clearfelling and roading operations and the fact that environmental and recreational forest values are often higher than the wood production values.

Alan Bell
Registered Forestry Consultant (RMNZIF)
Saturday, 29 August 2015

Appendices.
Cashflows by Forest.

RODING.

C:\SHEETS\RODING_2015 v11\CashFlows

Roding Year Begin 1 July	Net Harvest Revenue	Area Cut (ha)	Land Prep	Plant	Release	Boron	Prune 1	Prune 2	CW Thin	Struct Thin	Overheads	Other Cost	Other Cost	Net Cash
														8%
														$ 1,552,122
2015	$ -	0.0	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 15,150	$ -	$ -	-$ 15,150
2016	$ 799,822	34.3	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 15,150	$ -	$ -	$ 784,672
2017	$ 235,249	14.4	$ 27,440	$ 27,440	$ 12,005	$ -	$ -	$ -	$ -	$ -	$ 15,150	$ -	$ -	$ 153,214
2018	$ 593,118	34.5	$ 11,520	$ 11,520	$ 5,040	$ -	$ -	$ -	$ -	$ 10,500	$ 15,150	$ -	$ -	$ 539,388
2019	$ 312,863	13.9	$ 27,600	$ 27,600	$ 12,075	$ -	$ -	$ -	$ -	$ -	$ 15,150	$ -	$ -	$ 230,438
2020	$ 81,539	3.9	$ 11,120	$ 11,120	$ 4,865	$ 5,145	$ -	$ -	$ -	$ -	$ 15,150	$ -	$ -	$ 34,139
2021	$ 496,590	24.4	$ 3,120	$ 3,120	$ 1,365	$ 2,160	$ -	$ -	$ -	$ -	$ 15,150	$ -	$ -	$ 471,675
2022	$ -	0.0	$ 19,520	$ 19,520	$ 8,540	$ 5,175	$ -	$ -	$ -	$ -	$ 15,150	$ -	$ -	-$ 67,905
2023	$ -	0.0	$ -	$ -	$ -	$ 2,085	$ -	$ -	$ -	$ -	$ 15,150	$ -	$ -	-$ 17,235
2024	$ -	0.0	$ -	$ -	$ -	$ 585	$ -	$ -	$ -	$ -	$ 15,150	$ -	$ -	-$ 15,735
2025	$ -	0.0	$ -	$ -	$ -	$ 3,660	$ -	$ -	$ -	$ 24,010	$ 15,150	$ -	$ -	-$ 42,820
2026	$ -	0.0	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 10,080	$ 15,150	$ -	$ -	-$ 25,230
2027	$ -	0.0	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 33,880	$ 15,150	$ -	$ -	-$ 49,030
2028	$ -	0.0	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 15,150	$ -	$ -	-$ 15,150
2029	$ -	0.0	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 14,700	$ 15,150	$ -	$ -	-$ 29,850
2030	$ -	0.0	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 5,110	$ 15,150	$ -	$ -	-$ 20,260
2031	$ 94,412	8.5	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 15,150	$ -	$ -	-$ 79,262
2032	$ -	0.0	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 14,300	$ -	$ -	-$ 14,300
2033	$ -	0.0	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 14,300	$ -	$ -	-$ 14,300
2034	$ 60,229	2.6	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 14,300	$ -	$ -	$ 45,929
2035	$ -	0.0	$ 2,080	$ 2,080	$ 910	$ -	$ -	$ -	$ -	$ -	$ 14,300	$ -	$ -	-$ 19,370
2036	$ -	0.0	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 14,300	$ -	$ -	-$ 14,300
2037	$ -	0.0	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 14,300	$ -	$ -	-$ 14,300
2038	$ 254,289	15.0	$ -	$ -	$ -	$ 390	$ -	$ -	$ -	$ -	$ 14,300	$ -	$ -	$ 239,599
2039	$ -	0.0	$ 12,000	$ 12,000	$ 5,250	$ -	$ -	$ -	$ -	$ -	$ 14,300	$ -	$ -	-$ 43,550
2040	$ -	0.0	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 14,300	$ -	$ -	-$ 14,300
2041	$ -	0.0	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 14,300	$ -	$ -	-$ 14,300
2042	$ -	0.0	$ -	$ -	$ -	$ 2,250	$ -	$ -	$ -	$ -	$ 14,300	$ -	$ -	-$ 16,550
2043	$ -	0.0	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 1,820	$ 14,300	$ -	$ -	-$ 16,120
2044	$ -	0.0	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 14,300	$ -	$ -	-$ 14,300
2045	$ 565,950	34.3	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 14,300	$ -	$ -	$ 551,650
2046	$ 311,850	18.9	$ 27,440	$ 27,440	$ 12,005	$ -	$ -	$ -	$ -	$ -	$ 14,300	$ -	$ -	$ 230,665
2047	$ 724,350	43.9	$ 15,120	$ 15,120	$ 6,615	$ -	$ -	$ -	$ -	$ 10,500	$ 14,300	$ -	$ -	$ 662,695
2048	$ 184,800	11.2	$ 35,120	$ 35,120	$ 15,365	$ -	$ -	$ -	$ -	$ -	$ 14,300	$ -	$ -	$ 84,895

BROOK.

E:\SHEETS\Brook 2015 Act\Cashflows

Brook and York Valley Year Begin 1 July	Net Harvest Revenue	Area Cut (ha)	Land Prep	Plant	Release	Boron	Prune 1	Prune 2	CW Thin	Struct Thin	Overheads	Other Cost	Other Cost	Net Cash
2015	$ 391,549	20.0	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 11,860	$-	$-	$ 379,689
2016	$ 63,817	5.1	$ -	$ -	$ -	$ 5,130	$ -	$ -	$ -	$ -	$ 9,860	$-	$-	$ 48,827
2017	$ -	0.0	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 9,350	$-	$-	$ 9,350
2018	$ -	0.0	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 10,500	$ 9,350	$-	$-	$ 19,850
2019	$ -	0.0	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 7,000	$ 9,350	$-	$-	$ 16,350
2020	$ -	0.0	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 9,350	$-	$-	$ 9,350
2021	$ 64,384	3.0	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 280	$ 9,350	$-	$-	$ 54,754
2022	$ -	0.0	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 7,490	$ 9,050	$-	$-	$ 16,540
2023	$ -	0.0	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 31,640	$ 9,050	$-	$-	$ 40,690
2024	$ -	0.0	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 9,050	$-	$-	$ 9,050
2025	$ -	0.0	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 9,050	$-	$-	$ 9,050
2026	$ 84,872	3.4	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 9,050	$-	$-	$ 75,822
2027	$ -	0.0	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 8,710	$-	$-	$ 8,710
2028	$ 103,687	5.8	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 8,710	$-	$-	$ 94,977
2029	$ -	0.0	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 8,130	$-	$-	$ 8,130
2030	$ -	0.0	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 8,130	$-	$-	$ 8,130
2031	$ -	0.0	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 8,130	$-	$-	$ 8,130
2032	$ -	0.0	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 8,130	$-	$-	$ 8,130
2033	$ -	0.0	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 8,130	$-	$-	$ 8,130
2034	$ -	0.0	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 8,130	$-	$-	$ 8,130
2035	$ -	0.0	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 8,130	$-	$-	$ 8,130
2036	$ 207,769	15.0	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 8,130	$-	$-	$ 199,639
2037	$ 138,513	10.0	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 6,630	$-	$-	$ 131,883
2038	$ 151,179	11.0	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 6,630	$-	$-	$ 144,549
2039	$ 7,048	0.4	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 5,530	$-	$-	$ 1,518
2040	$ 171,130	10.7	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 5,530	$-	$-	$ 165,600
2041	$ 546,978	34.2	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 4,460	$-	$-	$ 542,518
2042	$ -	0.0	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 1,040	$-	$-	$ 1,040
2043	$ -	0.0	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 1,040	$-	$-	$ 1,040
2044	$ -	0.0	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 1,040	$-	$-	$ 1,040
2045	$ -	0.0	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 1,040	$-	$-	$ 1,040
2046	$ -	0.0	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 1,040	$-	$-	$ 1,040
2047	$ -	0.0	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 1,040	$-	$-	$ 1,040
2048	$ -	0.0	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 1,040	$-	$-	$ 1,040
													8%	$ 566,194

MAITAI.

E:\Sales\Maitai_2015.xlsx\Cashflows																		8%	$ 1,226,371
Maitai Forest																			
Year Begin 1 July	Net Harvest Revenue	Area Cut (ha)	Land Prep	Plant	Release	Boron	Prune 1	Prune 2	CW Thin	Struct Thin	Overheads	Other Cost	Other Cost	Net Cash
2015	$ -	-	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 15,900	$ -	$ -	-$ 15,900
2016	$ -	-	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 15,900	$ -	$ -	-$ 15,900
2017	$ 1,073,250	59.0	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 3,010	$ 15,900	$ -	$ -	$ 1,054,340
2018	$ 472,190	26.4	$ 27,600	$ 27,600	$ 12,075	$ -	$ -	$ -	$ -	$ -	$ 13,450	$ -	$ -	$ 391,465
2019	$ 75,571	3.6	$ 21,120	$ 21,120	$ 9,240	$ -	$ -	$ -	$ -	$ 10,710	$ 13,450	$ -	$ -	-$ 69
2020	$ 17,713	1.9	$ 2,880	$ 2,880	$ 1,260	$ -	$ -	$ -	$ -	$ -	$ 13,450	$ -	$ -	-$ 2,757
2021	$ 27,512	1.4	$ 1,520	$ 1,520	$ 665	$ 5,175	$ -	$ -	$ -	$ 7,000	$ 13,450	$ -	$ -	-$ 1,818
2022	$ -	-	$ -	$ 720	$ 315	$ 3,960	$ -	$ -	$ -	$ -	$ 13,400	$ -	$ -	-$ 19,115
2023	$ 124,525	15.2	$ -	$ -	$ -	$ 540	$ -	$ -	$ -	$ -	$ 13,400	$ -	$ -	$ 110,585
2024	$ 293,163	19.7	$ 8,480	$ 8,480	$ 3,710	$ 285	$ -	$ -	$ -	$ -	$ 12,940	$ -	$ -	$ 259,268
2025	$ -	-	$ 14,640	$ 14,640	$ 6,405	$ 135	$ -	$ -	$ -	$ -	$ 12,800	$ -	$ -	-$ 48,620
2026	$ -	-	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 24,150	$ 12,800	$ -	$ -	-$ 36,950
2027	$ -	-	$ -	$ -	$ -	$ 1,590	$ -	$ -	$ -	$ -	$ 12,800	$ -	$ -	-$ 14,390
2028	$ -	-	$ -	$ -	$ -	$ 2,745	$ -	$ -	$ -	$ 21,000	$ 12,800	$ -	$ -	-$ 36,545
2029	$ -	-	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 12,800	$ -	$ -	-$ 12,800
2030	$ -	-	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 1,960	$ 12,800	$ -	$ -	-$ 14,760
2031	$ 55,577	2.2	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 12,800	$ -	$ -	-$ 42,777
2032	$ -	-	$ 1,760	$ 1,760	$ 770	$ -	$ -	$ -	$ -	$ 7,420	$ 12,800	$ -	$ -	-$ 24,510
2033	$ -	-	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 630	$ 12,800	$ -	$ -	-$ 13,430
2034	$ -	-	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 12,180	$ 12,800	$ -	$ -	-$ 24,980
2035	$ -	-	$ -	$ -	$ -	$ 330	$ -	$ -	$ -	$ -	$ 12,800	$ -	$ -	-$ 13,130
2036	$ -	-	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 12,800	$ -	$ -	-$ 12,800
2037	$ -	-	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 12,800	$ -	$ -	-$ 12,800
2038	$ -	-	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 12,800	$ -	$ -	-$ 12,800
2039	$ 291,458	25.3	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 12,800	$ -	$ -	$ 278,658
2040	$ -	-	$ 20,240	$ 20,240	$ 8,855	$ -	$ -	$ -	$ -	$ 1,540	$ 12,800	$ -	$ -	-$ 63,675
2041	$ -	-	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 12,800	$ -	$ -	-$ 12,800
2042	$ 108,628	4.3	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 12,800	$ -	$ -	$ 95,828
2043	$ -	-	$ 3,440	$ 3,440	$ 1,505	$ 2,295	$ -	$ -	$ -	$ -	$ 12,800	$ -	$ -	-$ 23,480
2044	$ -	-	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 12,800	$ -	$ -	-$ 12,800
2045	$ -	-	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 12,800	$ -	$ -	-$ 12,800
2046	$ 490,500	34.5	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 12,800	$ -	$ -	$ 477,700
2047	$ 396,000	26.4	$ 27,600	$ 27,600	$ 12,075	$ -	$ -	$ -	$ -	$ -	$ 12,800	$ -	$ -	$ 315,925
2048	$ 67,500	4.5	$ 21,120	$ 21,120	$ 9,240	$ -	$ -	$ -	$ -	$ -	$ 12,800	$ -	$ -	$ 3,220

MARSDEN VALLEY.

C:\SHEETS\[Marsden_2015.xlsx]Cashflows

														8%
Marsden Valley														$ 615,435
Year Begin 1 July	Net Harvest Revenue	Area Cut (ha)	Land Prep	Plant	Release	Boron	Prune 1	Prune 2	CW Thin	Struct Thin	Overheads	Other Cost	Other Cost	Net Cash
2015	$ -	0.0	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 12,790	$ -	$ -	-$ 12,790
2016	$ -	0.0	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 12,790	$ -	$ -	-$ 12,790
2017	$ -	0.0	$ -	$ -	$ -	$ 4,260	$ -	$ -	$ -	$ 14,210	$ 12,790	$ -	$ -	-$ 31,260
2018	$ -	0.0	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 12,790	$ -	$ -	-$ 12,790
2019	$ -	0.0	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 12,790	$ -	$ -	-$ 12,790
2020	$ -	0.0	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 12,790	$ -	$ -	-$ 12,790
2021	$ -	0.0	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 12,790	$ -	$ -	-$ 12,790
2022	$ 549,243	23.9	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 19,880	$ 12,790	$ -	$ -	$ 516,573
2023	$ -	0.0	$ 19,120	$ 19,120	$ 8,365	$ -	$ -	$ -	$ -	$ -	$ 12,790	$ -	$ -	-$ 59,395
2024	$ -	0.0	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 12,790	$ -	$ -	-$ 12,790
2025	$ 1,030,247	49.8	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 12,790	$ -	$ -	$ 1,017,457
2026	$ -	0.0	$ 39,840	$ 39,840	$ 17,430	$ 3,585	$ -	$ -	$ -	$ -	$ 12,790	$ -	$ -	-$ 113,485
2027	$ -	0.0	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 12,790	$ -	$ -	-$ 12,790
2028	$ -	0.0	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 12,790	$ -	$ -	-$ 12,790
2029	$ -	0.0	$ -	$ -	$ -	$ 7,470	$ -	$ -	$ -	$ -	$ 12,790	$ -	$ -	-$ 20,260
2030	$ -	0.0	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 12,790	$ -	$ -	-$ 12,790
2031	$ -	0.0	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 16,730	$ 12,790	$ -	$ -	-$ 29,520
2032	$ -	0.0	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 12,790	$ -	$ -	-$ 12,790
2033	$ -	0.0	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 12,790	$ -	$ -	-$ 12,790
2034	$ -	0.0	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 34,860	$ 12,790	$ -	$ -	-$ 47,650
2035	$ 79,868	5.5	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 12,790	$ -	$ -	$ 67,078
2036	$ -	0.0	$ 4,400	$ 4,400	$ 1,925	$ -	$ -	$ -	$ -	$ -	$ 12,790	$ -	$ -	-$ 23,515
2037	$ -	0.0	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 12,790	$ -	$ -	-$ 12,790
2038	$ -	0.0	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 12,790	$ -	$ -	-$ 12,790
2039	$ -	0.0	$ -	$ -	$ -	$ 825	$ -	$ -	$ -	$ -	$ 12,790	$ -	$ -	-$ 13,615
2040	$ -	0.0	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 12,790	$ -	$ -	-$ 12,790
2041	$ -	0.0	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 12,790	$ -	$ -	-$ 12,790
2042	$ 927,162	48.7	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 12,790	$ -	$ -	$ 914,372
2043	$ -	0.0	$ 38,960	$ 38,960	$ 17,045	$ -	$ -	$ -	$ -	$ -	$ 12,790	$ -	$ -	-$ 107,755
2044	$ -	0.0	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 3,850	$ 12,790	$ -	$ -	-$ 16,640
2045	$ -	0.0	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 12,790	$ -	$ -	-$ 12,790
2046	$ -	0.0	$ -	$ -	$ -	$ 4,260	$ -	$ -	$ -	$ -	$ 12,790	$ -	$ -	-$ 17,050
2047	$ -	0.0	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 12,790	$ -	$ -	-$ 12,790
2048	$ -	0.0	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 12,790	$ -	$ -	-$ 12,790

Nelson City Council

Response to Alan Bell and Associates Review of Nelson City Council Plantations Report

dated 17 August 2015

August 2015

PFOLSEN

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Table of Contents

1. Summary

PF Olsen has corrected a few errors in the review that are relatively inconsequential. These are minor details such as stand areas and numbers and incorrect assumptions around the ability to harvest and replant some stands. We have made suggestions on some alternative options.

The conclusion to convert the entire resource to an unpruned resource is too simplistic. Roding Forest with lower growth rates and smaller branching characteristics is managed on a structural (unpruned) regime. Marsden Forest was established on fertile ex-pasture sites where trees have faster growth rates and develop larger branching habits. This forest has been managed on a clearwood (pruned) regime to date. PF Olsen recommend the decision on regime for the next rotation be made closer to the harvest of the existing crop. Full economic valuation of pruning regimes can be made at that time.

The suggestion to sell cutting rights for Roding Forest is counterproductive to the stated council aims for water and soil quality management and recreation management. The purchasers of these stands do not have the same long term objectives as council. The buyers of these cutting rights will sell the logs on the spot market rather than obtaining the financial gains from a consistent domestic supply. These buyers will also purchase the cutting rights to make a margin, and this will mean reduced sales revenue for the Nelson City Council (NCC). Indeed, less than 5% of mature stands in New Zealand are sold in this manner due to the lower financial returns.

The option for council employing its own staff will increase the risks around legislative compliance and contractor performance. Engaging a national based forest manager with local knowledge provides the NCC with the most efficient forest management available. Specialist health and safety, environmental, and engineering expertise is required in this increasingly complex and legislative environment. When utilising the services of PF Olsen this cost is spread over a much larger resource, reducing the costs for the NCC.

PF Olsen calculate that NCC would be financially better off by reducing the Emissions Trading Scheme (ETS) registered area from the current 123 hectares down to 99 hectares.

2. Introduction

PF Olsen response to review	PF Olsen has noted some errors and assumptions in the review by Alan Bell and Associates dated 17 August 2015. We have noted our views in the same order as the original review for ease of comparison by NCC.

3. Economics of NCC Forests (IRR)

Prune/unpruned	See following chapter.

4. Why an unpruned regime?

To prune or not to prune	The modest growth rates and small branching characteristics of some forests do suit an unpruned structural regime. PF Olsen is presently managing stand under a structural regime in Roding Forest. Marsden Forest is established on fertile ex-pasture sites. Trees on these high fertility sites display above average growth rates and larger branching characteristics that benefit from a pruning regime. PF Olsen recommend the decision on regime for the next rotation be made closer to harvest of the current crop. Full economic valuation of pruning regimes can be made at that time. Very little pruning has been undertaken in the Nelson region over the past few years and eventually the pruned resource will run out. This will increase demand for good pruned logs. We are already selling pruned logs for in excess of $180 m^3. We think keeping options open at this stage is prudent.

5. Why should NCC be in forestry?

Forestry benefits	PF Olsen concur with the observations in this chapter.

6. Rationalising NCC forests

Rationalisation of the forest estate

This should be reviewed over the entire estate to provide clarity for the management of the resource. It would reduce a lot of the public interface with the forests, whilst enhancing the non-financial benefits of the forests. PF Olsen has the local knowledge to assist with this process. Each stand should be ranked by financial output then this compared to non-commercial values. This could be implemented over a period of time to minimise costs.

7. Value of NCC forests

Forest Valuation

The valuation of the tree crop asset owned by Nelson City Council was prepared for the purpose of financial reporting. The application of generic yield tables and costs is appropriate for this purpose. To change the valuation process to stand based yields and costs would require detailed harvest planning of each block. This would significantly increase the costs of preparing this valuation. In his valuation, Alan does not state the basis of his discount rate assumptions. The difference in the value estimate may actually be from a slightly different discount rate assumption. The difference between the PF Olsen tree crop value estimate and Alan Bell's assessment undertaken as part of his review is only 3%. We consider this difference in the tree crop value estimate to be relatively small and immaterial.

Alan's comments that the valuation was prepared by a Rotorua-based valuer and had not been checked by the PF Olsen Nelson-based staff is incorrect. Whilst a specialist valuer based in Rotorua prepared the valuation, Erin Leahy worked closely with the PF Olsen Nelson staff who provided all cost information based on their operational knowledge of the blocks. The valuation was peer reviewed by Theo Vos, the consulting manager at PF Olsen with 27 years of experience in forest valuations.

The error in replacement costs methodology for young stands was unfortunately overlooked by PF Olsen, but the impact of this oversight should not be overstated. These young crops contribute little to the total tree crop value estimate. Correcting this error increased the tree crop value by only 4.4%. PF Olsen apologised for this error and provided a replacement report as soon as the error was noted.

The time frame to meet NCC reporting requirements did not allow for the latest inventory data to be validated and used. This has now been incorporated into the most recent 10 year plan.

8. Cashflows over time

Cashflows	Included in forest value chapter.

9. Future management strategy by stand

Strategy by stand	See following chapter.

10. Stand by stand details and possible future strategy

Alternative recommendations	PF Olsen local staff have made some alternative suggestions to the recommendations by Alan on individual stand management. We have listed these by forest in the same order as Alan's original report. It should be noted that reversion from pine to native will require management intervention. This was attempted with stand 54.02 in the Roding Forest and ended with P.rad natural regen of 5,000 stems per hectare.
Maitai	1.01 Some harvesting of at least part of this stand is practical. 1.02 Infrastructure will be in place following harvest so no reason not to replant. 2.01 Harvest with 2.03 3.01/3.02 Can harvest 4.03 Harvest if economic return to NCC. 4.05 Harvest sooner. Latest data analysis show this stand is ready to harvest now. 4.08 Small area of non-commercial wattle. Fell to waste to eliminate weed spread. 4.13 Harvest with surrounding stands and replant. 4.14 Harvest with 4.04 and replant. 9.01 Plant with P. rad instead of D.fir. 10.1 Harvest and replant with P.rad to prevent wilding spread (Has been harvested previously). 10.2 Can be harvested independent to Hancocks.

Marsden	42.06 Harvest early (Possibly with stands 42.07 and 42.08) and replant with P. rad. NCC staff are concerned about possible wilding spread. 42.07 Recommend decision on pruning the next rotation be made following harvest of the current crop. 42.08 Harvest with 42.06 and 42.07 and replant with P. rad.
Roding Forest	54.02 Reversion to native will require management intervention as mentioned previously.
Brook Forest	21.04 Recreation reserve enhancement as currently being considered by NCC. This is a far cheaper option than native reestablishment and planting. 22.09 Recommend replant with P. rad. Infrastructure is in place and harvesting is straight forward. Cycle access through the stand can be controlled for harvesting operations. 22.02 Will need to review economic feasibility of harvesting. No replant 22.08 Once harvested infrastructure will be in place so the option to replant with P.rad will exist. 22.03 Replant with P.rad. Access is in place and easy harvesting. 25.01 Fell to waste before trees get too large then allow to revert to native. 26.01 Harvest when current landfill moves. 26.02 Harvest when current landfill moves. 29.01 Replant with P.rad. Harvesting of these stands will be at least 25 years away so a decision on future commercial forestry here should be made closer to that time. Costs to convert large areas to native will be very high. 29.02 Possible replant. Review options. As above.

11. Communication

Public input	PF Olsen agree that improved communication channels from NCC would facilitate forest management planning. But the NCC Forests are located where they are, and the ownership means political input from ratepayers will always be a significant factor. The judicious reversion of some stands to native or longer rotation exotic species after clear fell will alleviate some perceived conflict issues.

12. Conflicts of Interest

Deliberately independent

PF Olsen works hard to maintain its independence to ensure it provides a comprehensive service to its clients with minimal conflicts of interest.

Please note that PF Olsen is not a stakeholder in any of the following activities:

- Forest ownership[1],
- Harvesting,
- Log cartage,
- Log processing,
- Export log trading.

13. Management structure of other councils

Tararua DC

PF Olsen does not manage forest operations for Tararua Council as stated in the report, but does undertake their annual forest valuation.

Other Councils

PF Olsen considers the management of other council estates as irrelevant and questions the costs and benefits mentioned in the review.

They do not allow for costs such as mapping, stand records, maintaining databases for health and safety and environmental management, increased consulting and auditing costs.

There is no allowance for increased risk in:

- Health and safety performance
- Environmental performance
- Financial results
- Reputational damage

For the record PF Olsen manage forest operations for 11 councils in New Zealand.

[1] with the exception of one small legacy holding on the East Coast of the North Island

14. Current management structure

Current structure	This is too simplistic and doesn't cover all the duties of a competent and professional forest manager.

15. Possible alternative management structure

Council managing own forests	More councils are moving away from in-house management due to the following reasons: • Increased complexity around health and safety legislation. • Increased liabilities in health and safety principal duties. • Continuity of management. • More thorough planning and management of harvesting which is becoming increasingly important as forest management complexity increases. • Ability to benefit from specialist expertise (health and safety, environmental, harvest planning, marketing) employed by forest management companies spread over a much larger resource to reduce cost. • Improved marketing in a volatile market environment. Alan Bell has not factored in the costs of specialist consultant expertise, maintaining mapping and stand record systems, increased auditing costs or the costs of risk as mentioned previously.

16. Emissions trading scheme

ETS

PF Olsen agree that if the council is not going to take a more active role in trading NZUs, then there is no point in being in the ETS (money under the mattress analogy). Other PF Olsen forest owner clients have taken advantage of opportunities arising out of the ETS to date, e.g. selling NZUs at $20 and buying back NZUs at $2, or taking advantage of the arbitrage opportunity, deregistering from the ETS and surrendering cheap imported ERUs. The NCC did not take advantage of the arbitrage opportunity. If de-registering now, the council would need to surrender all units (NZUs) claimed to date. The ETS is subject to a review starting this year and we do not know if there will be changes to the scheme that will make it more attractive to the NCC.

An option for the council to avoid the significant costs of the FMA plotting, is to reduce the registered ETS area from 123ha down to 99ha. This would remove the requirement for the FMA plotting which is a significant cost. This option was put to the council in 2012 and remains available. If continuing with 99ha registered in the ETS, then the council reduces the costs of participation in the ETS, but retains a large part of the potential future benefits. These benefits likely include carbon trading. The cost of participation in the ETS would then be limited to only preparing emissions returns, with one emission return required every 5 years.

17. Avoiding fluctuations in harvest revenue

Optimising harvest revenue

The reasons mentioned in the review are exactly the reasons why harvesting the resource in a considered consistent approach with a competent manager is more likely to achieve better financial results than selling stumpage or cutting rights on the market.

18. Alternative mechanisms for harvesting forests

Sale options

All these points listed are incorrect. There is no proof that accountability or independence are improved by separating the tasks of forest management from harvesting. In fact you would significantly increase cost and risks.

The risk is not shifted to the forest/log/stumpage buyer at all. The NCC is still a principal and in fact increases its risk by engaging with a wider variety of entities.

19. Initiatives/action points for NCC

NCC Forest visit	PF Olsen staff encourage NCC staff to visit the forest operations on a more regular basis to familiarise themselves with the management of the resource. PF Olsen recommends maintaining one point of contact in NCC for forest management.
Deregister from ETS	Already covered.
Initiate peer review.	Isn't that what this review was meant to be?
Annual audit	Is an annual audit necessary or justified? PF Olsen has a strong risk management emphasis in its services and undertakes regular external and internal auditing as part of ISO and FSC accreditation management systems. Forme Consulting, Du Pont and Cosman Parkes (TDC estate) also audited PF Olsen health and safety performance recently. PF Olsen is also a NCC approved contractor which is reviewed 2 yearly by NCC.
Review insurance	PF Olsen is happy to provide a quote for insurance on our Group Scheme.
Sell maturing blocks on open market	Not recommended for reasons already stated. No forests in Nelson are sold this way. This NCC volume would just be swamped with all the other maturing woodlots volume in Nelson.

20. Risks

Risks	All a repeat of previous comments made elsewhere in Alan's report. .

21. Performance of the current forest manager

Harvest scheduling	Harvest plan recently completed and sent to NCC. It seems Alan hasn't been provided with a copy of this.
Insurance	Alan has stated in this section that insurance costs appear to be relatively high. PF Olsen does not provide the insurance cover for NCC. We would be happy to provide a quote for insurance.
Valuation and stand records	Mentioned earlier.

22. Forest efficiency

Forest efficiency	All repeat comments.

23. Advantages of exotic forestry for NCC

Multiple advantages	Agree with comments here. There are more domestic options than mentioned in the review.

24. Disadvantages of exotic forestry for NCC

Wildings	Control of wildings spreading into native should be undertaken.

25. Challenges of managing NC forests

Management challenges	These are further reasons why the forest will perform better in all respects under a competently managed harvesting and marketing programme than an ad-hoc sale process.

26. PF Olsen Limited

PF Olsen Ltd	PF Olsen Ltd changed its name from PF Olsen and Co over eight years ago.