Lake Rotorua Underutilised Māori Land Analysis

Prepared by

Perrin Ag Consultants Ltd

In conjunction with Scion

REPORT PREPARED BY

PERRIN
AG CONSULTANTS

REGISTERED FARM MANAGEMENT CONSULTANTS

Perrin Ag Consultants Limited
1330 Eruera Street, P O Box 596, Lake Rotorua

Phone: 07 349 1212 Fax: 07 349 1112
Mobile: 021 955 312 (D J Perrin) / 0292 955 312 (T Laan)
0293 955 312 (L Matheson) / 0273 403 984 (D Walker)

Email: consult@perrinag.net.nz

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EXECUTIVE SUMMARY

The Bay of Plenty Regional Council ("BOPRC") is in the process of implementing draft nutrient rules for all rural land in the Lake Rotorua catchment (Plan Change 10) with the purpose of improving water quality by reducing nitrogen inflows into the lake. Proposed Nitrogen Discharge Allowances ("pNDA") for each property have been derived using the Rule 11 Benchmark as a starting point with a percentage reduction in nitrogen discharge allocation based on where each properties' Rule 11 Benchmark sits relative to other properties of equivalent land use, otherwise known as the "sinking lid". The proposed discharge allowances are limited to a range of 48.7kg N/ha to 64.9kg N/ha[1] over the effective pastoral area for dairy farming operations and 17.1kg N/ha and 51.9kg N/ha[1] over the effective pastoral area for drystock farming operations[2].

Perrin Ag Consultants Ltd ("Perrin Ag"), in conjunction with Scion, were engaged to identify, quantify and describe underutilised Māori land in the Lake Rotorua catchment and assess the financial implications of the draft nutrient rules as it relates to potential land use change underutilised leased Māori land.

Underutilised Māori land in the catchment was identified by progressively eliminating Māori land deemed to be utilised given its existing land use[3] relative to the geophysical characteristics of the land and any environmental covenants limiting land use change. This step removed 6,764 hectares of utilised land, leaving 5,017 hectares of potentially underutilised Māori land in the catchment. However, size and contiguity of land parcels, contiguity with neighbouring land uses, access and cultural values are examples of limitations which can only be assessed on an individual parcel basis to accurately determine utilisation.

Baseline evaluation models were created from practical scenarios of farm/forest production systems. Financial implications of the draft nutrient rules as it relates to land use change were analysed by comparing the change in profitability when converting underutilised base models to the most profitable land use option;

i) prior to Rule 11;

ii) under Rule 11;

iii) under the draft nutrient rules.

[1] Overseer version 6.2.1.
[2] Drystock farming operations include dairy grazing and cropping for benchmarking purposes.
[3] As identified in the Rule 11 benchmarking process.

Prior to Rule 11

Prior to Rule 11, conversion to cropping is, on average, the most profitable land use conversion option, followed by dairy then dairy support. This is partly due to cropping only being considered suitable on LUC[4] Class 2 and Class 3 land but also due to the relatively low capital cost associated with converting to cropping compared to grazed pasture systems. Given the land being assessed is deemed underutilised, it is not unexpected that on average the change in total profitability when converting land to the most profitable land use option prior to Rule 11 (excluding any nitrogen discharge rules) results in an average increase in total profitability of $155/ha/yr.

Under Rule 11

By converting to the most profitable land use option under Rule 11, assuming the market value for tradeable nitrogen ("N") is $210/kg N, the result is an average increase in total profitability projected at $131/ha/yr.

However, while nitrogen is currently tradeable under Rule 11D, there is not necessarily an active market for traded nitrogen in the catchment. Assuming there is no market for traded N under Rule 11, then an average increase in the total profitability is projected at $71/ha/yr.

Under the Draft Nutrient Rules

By converting to the most profitable land use option under the draft nutrient rules, assuming the market value for tradeable nitrogen ("N") at $210/kg N, the result is an average increase in total profitability projected at $119/ha/yr.

Under the draft nutrient rules, conversion to the relatively low N leaching pastoral option of cut and carry is projected to be the most profitable land use conversion option. This is followed closely by forestry then Manuka. This is largely due to the assumption of capital nitrogen being realised at $210/kg N under these scenarios.

[4] Land use capability.

While the above figures illustrate the projected change in profitability from adopting the most profitable land use option under various nitrogen restriction rules, to assess the impact of the draft nutrient rules, the change in profitability under each scenario needs to be compared.

Assessing the impact of draft nutrient rules relative to the change in profitability which could have otherwise been achieved from land use change prior to Rule 11 is one perspective.

(i) Under this perspective the draft nutrient rules would result in an average net decrease in profitability of ($36)/ha/yr.

Assessing the change in profitability under the draft nutrient rules relative to the change in profitability which could have been otherwise achieved from land use change post Rule 11 is another perspective. This perspective also varies depending on whether the capital value of nitrogen is accounted for, i.e. whether there is assumed to be a market for traded nitrogen under Rule 11.

(i) Assuming the capital value of nitrogen is accounted for at $210/kg N under Rule 11, the draft nutrient rules would result in an average net decrease in total profitability of approximately ($12)/ha/yr. This is due to the impact of capital nitrogen already being accounted for under Rule 11.

(ii) Assuming there is no market for traded nitrogen under Rule 11, the draft nutrient rules would result in an average net increase in total profitability of approximately $48/ha/yr. This is primarily due to a market for traded nitrogen being created under the draft nutrient rules.

While the figures presented here show average profitability trends over the 5,017ha of potentially underutilised land in the catchment, under various nitrogen restriction scenarios, there is likely to be a significant range in these impacts between individual land parcels given the range in limitations to land use change that can only be assessed on an individual parcel basis.

PERRIN AG CONSULTANTS

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1. BACKGROUND AND TERMS OF REFERENCE

1.1. The Bay of Plenty Regional Council ("BOPRC") are in the process of developing draft nutrient rules (Plan Change 10) for all land in the Lake Rotorua catchment with the purpose of improving water quality by mitigating nitrogen inflows into Lake Rotorua over time.

1.2. As per the Regional Policy Statement, to achieve a sustainable in-lake nitrogen loading of 435t N, a total reduction of 320t N is required. This 320t N reduction is projected to be achieved by:

(i) 30t N removed by way of a reduction in gorse area;

(ii) 50t N removed by way of improvements in engineering;

(iii) 100t N removed by way of the incentives board purchasing nitrogen;

(iv) 140t N removed by way of implementing the draft nutrient rules.

1.3. The draft nutrient rules result in proposed Nitrogen Discharge Allowances ("pNDA") for rural properties within the Lake Rotorua catchment. These have been derived using the properties Rule 11 Benchmark as the starting point, with a percentage reduction in nitrogen discharge allocated based on where each properties Rule 11 Benchmark sits relative to other properties of equivalent land use. The extent of the proposed reduction is limited to a range in allowances of 48.7kg N/ha and 64.9kg N/ha[5] over the effective pastoral area for dairy farming operations and 17.1kg N/ha and 51.9kg N/ha over the effective pastoral area for drystock farming operations[6].

1.4. The BOPRC engaged Perrin Ag Consultants Ltd ("Perrin Ag") to undertake analysis on the impact of the draft nutrient rules on underutilised Māori land within the Lake Rotorua catchment. The specific outcomes sought from the analysis were:

(i) To identify, quantify and describe all Māori land in the Lake Rotorua catchment.

(ii) To identify, quantify and describe all underutilised Māori land in the Lake Rotorua catchment.

(iii) To assess the financial implications of the draft nutrient rules on underutilised Māori land as it relates to potential land use change.

(iv) To inform decision making on the draft nutrient rules.

[5] Overseer version 6.2.1.
[6] Drystock farming operations include dairy grazing and cropping for benchmarking purposes.

1.5. This analysis was to be based around hypothetical lease models broadly representative of actual underutilised Māori land in the catchment.

2. METHODOLOGY

2.1. The analysis was governed by methodology outlined by the BOPRC in the Request for Quote documents ("RFQ").

2.2. The first stage of the analysis was to identify all Māori land within the Lake Rotorua catchment. Appropriate geographic information systems ("GIS") data for Māori land within the catchment was provided by the BOPRC and Te Tumu Paeroa ("TTP"). This used Scion's GIS capability who collated data, then segmented this data by existing land use as per the BOPRC Rule 11 benchmark land categorisation, plus geophysical categories including land use capability ("LUC"). The data set was then summarised in Microsoft Excel using pivot tables and graphs.

2.3. To quantify underutilised Māori land at a catchment level, a quantitative rather than subjective approach was implemented by which rules could be imposed to filter utilised land parcels using GIS.

i) The first filter was to remove any land which was deemed to be fully utilised given its existing land use. These areas include urban, water ways, wetlands, roading, housing etc.

ii) The second filter was to remove any land which is covenanted by an environmental programme preventing one or more types of land use change.

iii) Each existing land use was then split by land use capability. New Zealand Land Resource Inventory (NZLRI) is a national database of physical land resource information[7]. This enabled the geophysical characteristics of the land to be compared to land use, thus filtering out any land which was deemed utilised given its LUC.

2.4. The result of the filter process was a summary of potentially underutilised Māori land based on geophysical characteristics excluding any environmentally covenanted land.

2.4.1. Land with a formal governance structure was not filtered out as utilised land at this stage of the analysis but rather identified for discussion.

2.4.2. Similarly Significant Natural Areas (SNA's) were not filtered out as utilised land but were also identified for discussion.

[7] Ex Landcare Research.

2.5. Physical GIS data along with actual Rule 11 benchmark and pNDA data for these potentially underutilised areas were averaged for each land use category to create the base hypothetical underutilised land models in OVERSEER 6.2.1.

2.6. Guidelines from the BOPRC as to the nature of the hypothetical scenarios to be analysed were reviewed and adjusted utilising best professional judgement in order to deliver better illustration of the realistic scenarios within the Lake Rotorua catchment.

2.7. Hypothetical models were created for seven potentially underutilised land use categories with individual models replicated for each LUC class giving a total of 23 hypothetical base models. The seven initial land use categories were: Bush and Scrub, Cut and Carry, Forestry, Gorse, Grazed trees, Dairy Support, Dry Stock. Land in Dairy was considered fully utilised. While there is no land identified as used for Manuka honey, this was added as an eighth scenario option.

2.8. Given the scope of the study is concentrated on land use change, it was necessary to create a base model for each of the five LUC classes within each existing land use. The alternative would be to have a range of LUC classes within each base hypothetical model which would result in very complex modelling when assessing land use change with less interpretable results.

2.9. Scenario modelling was completed on the basis that each of the eight potential land use conversion options were considered providing the LUC class of the hypothetical model was suitable, thus resulting in a total of 144 scenario models being created.

2.10. As per the terms of the RFQ, change in operating profitability was measured by the relative change in assumed rental value for the land.

2.11. Conversion costs were analysed for each scenario, discounted at a rate of 8% (to represent the opportunity cost of these funds), which were then combined with the change in operating profitability to ascertain the total change in annual profitability for each scenario.

2.12. The change in land value resulting from any land use conversion was not analysed given the majority of the land in question is unlikely to be sold due to is being multiply owned Māori land. Therefore any capital gains or losses in land value is unlikely to be realised.

2.13. OVERSEER 6.2.1 outputs were then used in Perrin Ag's own financial analysis models to calculate the impact on profitability under Rule 11 and under the draft nutrient rules.

This enabled the impact of the draft nutrient rules to be compared assuming a starting point of either prior to or post Rule 11.

2.14. Land rental prices for all pastoral models and conversion costs used in all financial analysis reflect current seasonal averages which the authors considered appropriate as regards medium pricing expectations.

2.15. Given the significant impact slope has on forestry economics, the relativity between forestry lease rentals on each LUC class was important. Consequently, projected forestry annuities which achieve an equivalent Net Present Value at an 8% discount rate, were calculated for each LUC class assuming a structural grade management regime. These annuities were then reduced by 15% as a margin for risk to predict what a potential lessee may be willing to pay as forestry rental on each LUC class. Projected lease rentals were then cross referenced with actual lease rentals in the central north island.

2.16. Where land was assumed to be converted from gorse, the gorse clearing incentive of $4,500/ha provided by BOPRC was included when assessing the change in profitability from land use conversion under Rule 11 and the draft nutrient rules. However this incentive was not applied when assessing the change in profitability from land use conversion prior to Rule 11 given the gorse clearing incentive is a function of ROTAN modelling target to remove 320t N from the lake.

2.17. The impact of carbon trading under the emissions trading scheme ("ETS") and the afforestation grant scheme ("AGS") have been excluded from the financial analysis. While there is potential for land owners and/or lessees who are considering converting from pastoral land into trees to increase returns through carbon trading, there are a number of influencing factors affecting uptake of these schemes on leased land which are unable to be assumed in a high level analysis such as this. Influencing factors which are unable to be assumed include:

i) Individual risk to the land owner; particularly under a lease scenario where the lessee owns the trees.

ii) Eligibility; particularly when applying for the AGS given area the minimum needs to be greater than 5ha and priority given to areas which will see soil erosion reduced.

iii) Viability given compliance/registration costs relative to the land area in question.

2.18. The impact of Greenhouse Gas ("GHG") emissions was not included in the financial analysis.

3. MĀORI LAND IN THE LAKE ROTORUA CATCHMENT

3.1. Māori land in the Lake Rotorua catchment totals 11,781ha, more or less. This area is made up of a range land use categories as defined by the BOPRC as part of the Rule 11 benchmarking process (Figure 1).

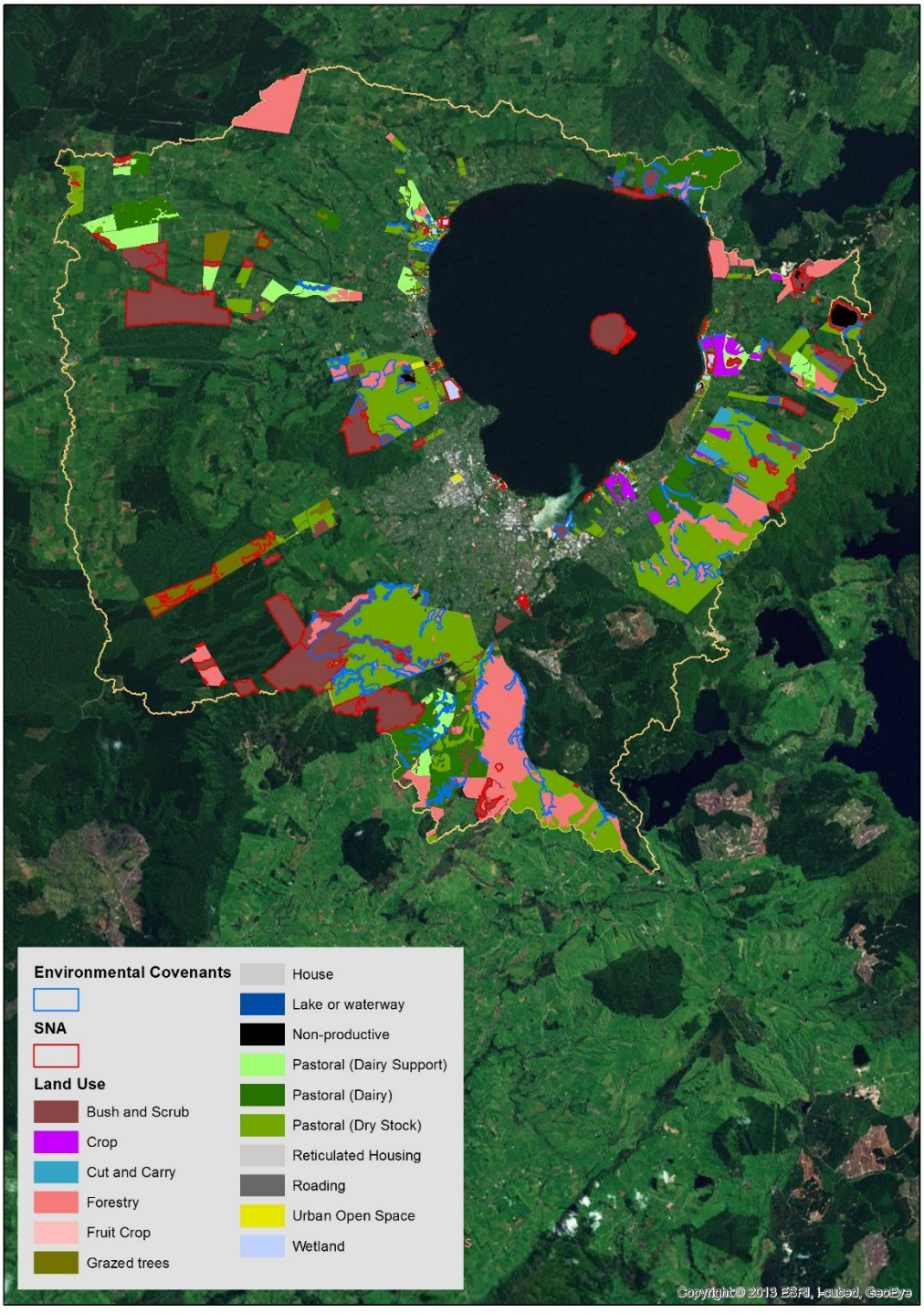

Figure 1. Māori land in the Lake Rotorua catchment by land use category, environmental covenants and significant natural areas (SNA).

3.2. 'Pastoral Drystock' represents the majority of the Māori land in the catchment totalling 3,828 hectares. 'Bush and Scrub' and 'Forestry' are the next largest contributors at 2,396 hectares and 2,053 hectares respectively (Table 1).

Table 1. Māori land in the Lake Rotorua catchment by land use and LUC.

Land Use catergory	2	3	4	6	7	8	Total
Bush and Scrub	6	150	688	994	503	55	2,396
Crop	101	73	21	2	-	-	197
Cut and Carry	17	26	5	3	-	-	51
Forestry	3	221	440	1,026	351	12	2,053
Fruit Crop	-	-	0	-	-	-	0
Gorse	4	14	95	349	143	2	607
Grazed trees	0	12	199	174	10	30	424
House	3	12	4	2	1	-	23
Waterway	-	1	-	0	0	-	1
Non-productive	0	3	6	5	8	3	25
Pastoral (Dairy Support)	5	98	283	216	52	-	654
Pastoral (Dairy)	75	178	196	700	64	-	1,214
Pastoral (Dry Stock)	64	293	944	2,183	302	42	3,828
Reticulated Housing	1	1	2	-	-	-	4
Roading	-	0	1	7	0	-	8
Urban Open Space	0	6	4	-	0	-	10
Wetland	3	81	3	-	3	-	89
Total	**282.8**	**1,169.6**	**2,890.3**	**5,659.7**	**1,437.2**	**144.6**	**11,584**
Lake							71
Town							126
All							**11,781**

3.3. The majority of Māori land in the catchment sits on LUC Class 4 to Class 7 land accounting for a total of 9,987 hectares or 84.8% of total Māori land in the catchment **(**Figure 2). Notably there were no parcels categorised as Class 1 land (flat, alluvial soils) or Class 5 (high producing land with physical limitations, like rocks or wetness) in the Lake Rotorua catchment.

3.4. While still included in the aggregated totals, Māori land categories with less than 1.0 hectares associated with a particular land use has been excluded from the illustrations from this point in the report.

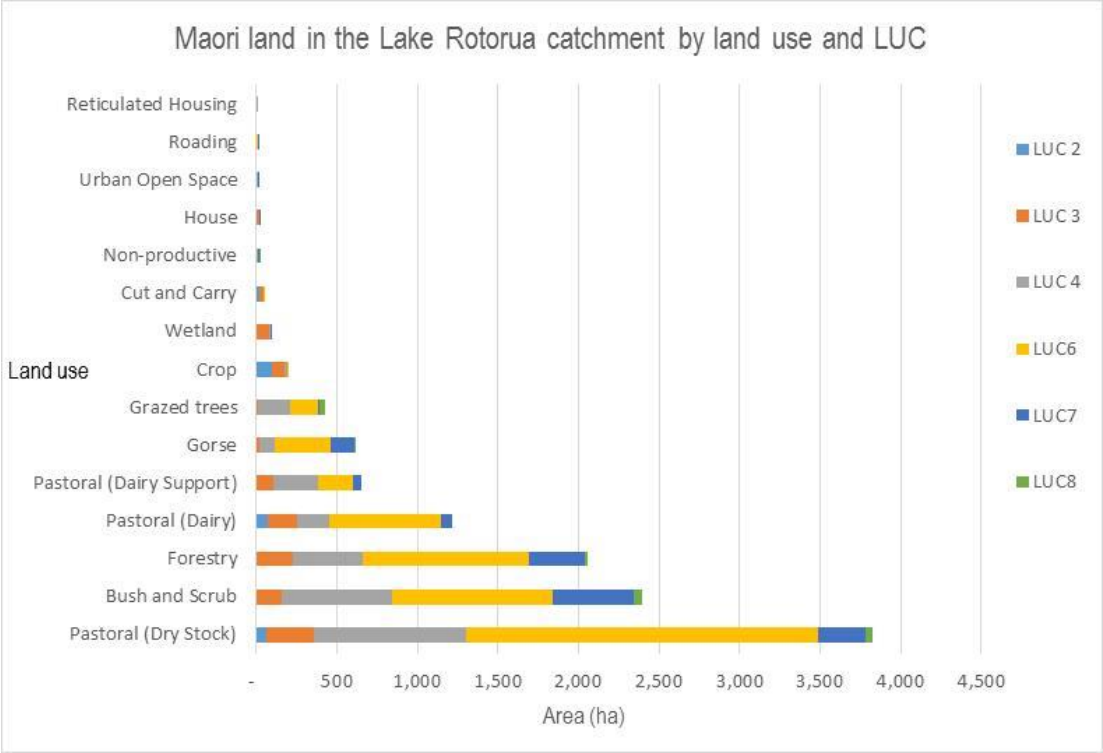

Figure 2: Māori land in the Lake Rotorua catchment by land use and LUC.

3.5. Māori land which forms part of the Lake or Town does not have an associated LUC class and is therefore is excluded from Figure 2.

3.6. Of the total area of Māori land in the Lake Rotorua catchment, 8,095 hectares has a formal governance structure with 3,686 hectares (31.3%) without a known formal governance structure.

3.7. Forestry, Bush and Scrub and Pastoral Drystock represent the majority of the land with no known governance structure (Figure 3).

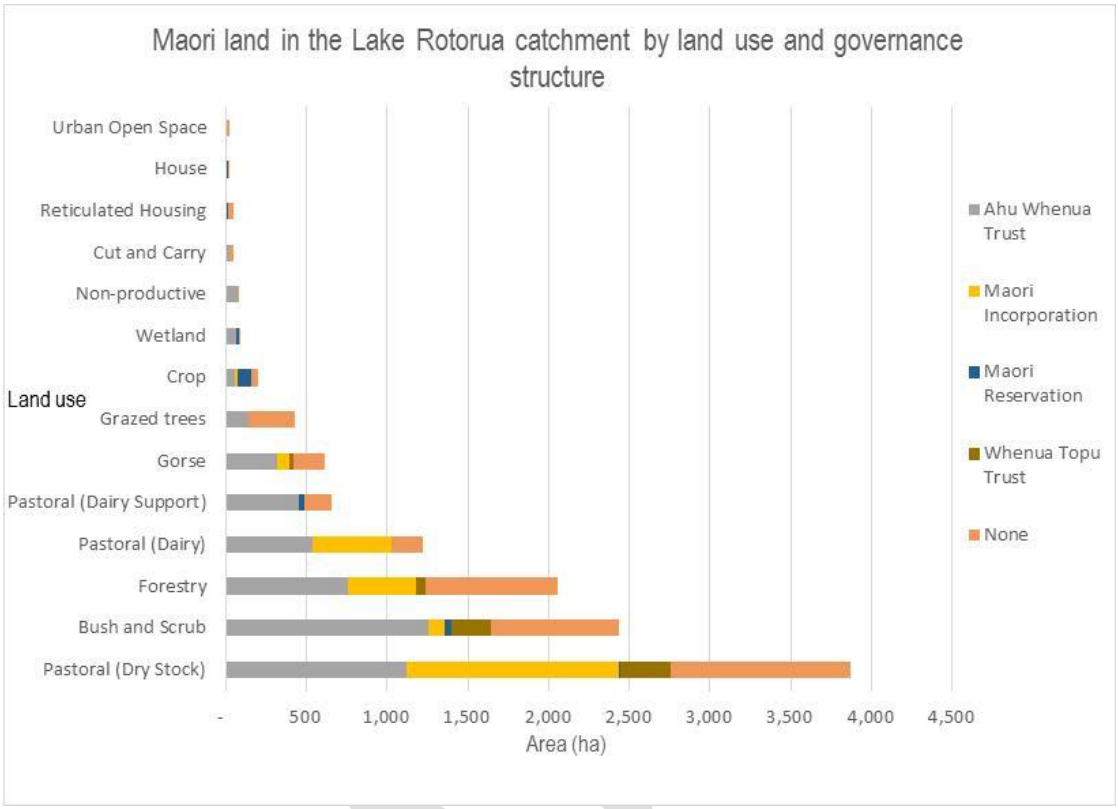

Figure 3. Māori land in the Lake Rotorua catchment by land use and governance structure.

4. UNDERUTILISED MĀORI LAND IN THE LAKE ROTORUA CATCHMENT

4.1. To identify potentially underutilised land in the Lake Rotorua catchment a filter process was implemented where land deemed to be utilised was removed on a progressive basis.

4.2. The first filter removed any non-productive area where land use change was not physically or financially feasible given the existing land use. These areas were deemed to be fully utilised. This filter removed 358 hectares of urban, roading, waterway, lake and wetland areas.

4.3. The second filter removed areas that are covenanted by existing environmental protection programmes limiting land use conversion. The following environmental programmes were assessed with regards to potential land use change:

i) Biodiversity Management Plan (BMP)

ii) Harbour Management Plan (HMP)

iii) Environmental Programmes (E Programme)

iv) Environmental Plans (E Plan)

v) Environmental Management Plan (EMP)

vi) Riparian Management Plan (RMP)

vii) QEII

4.3.1. This step identified a total of 536 hectares of Māori land in the catchment. However, as some of the areas with environmental covenants were removed in the first filter (4.2), the second filter removed a further 513 hectares as utilised land.

4.3.2. While there is likely to be areas within these covenanted parcels which have potential to be converted to another land use, such as gorse areas, it is likely that much of this land use conversion will be limited to native bush and scrub retirement given the environmental covenants in place.

4.4. After removing utilised land in the first two filters, a total of 10,910 hectares of potentially underutilised Māori land remains (Table 2).

Table 2. Māori land in the Lake Rotorua catchment with non-productive and environmental protection areas removed.

LUC	Pastoral (Dairy)	Pastoral (Dairy Support)	Crop	Cut and Carry	Pastoral (Dry Stock)	Grazed trees	Forestry	Bush and Scrub	Gorse	Total
2	74	5	101	17	64	0	3	5	4	274
3	178	98	73	26	290	11	221	135	12	1,043
4	195	283	21	5	932	199	423	670	88	2,816
6	693	216	2	3	2,130	174	935	935	301	5,388
7	64	52	-	-	283	8	272	470	107	1,255
8	-	-	-	-	42	29	7	53	2	134
	1,203	654	197	51	3,741	421	1,861	2,269	515	10,910

4.5. By comparing land use with LUC, the potentially productive Māori land was categorised as to whether land was deemed utilised or underutilised on a geophysical basis. Table 3 summarises land utilisation under various land use and LUC combinations.

Table 3. Land utilisation by land use and LUC.

LUC	Pastoral (Dairy)	Pastoral (Dairy Support)	Crop	Cut and Carry	Pastoral (Dry Stock)	Grazed trees	Forestry	Bush and Scrub	Gorse
2	U	UU	U	UU	UU	UU	UU	UU	UU
3	U	UU	U	UU	UU	UU	UU	UU	UU
4	U	U	U	U	UU	UU	UU	UU	UU
6	U	U	U	NA	U	U	U	UU	UU
7	U	U	NA	NA	U	U	U	UU	UU
8	NA	NA	NA	NA	NA	NA	U	U	U
	U = Utilised		UU = Underutilised			NA = Not applicable			

4.6. After removing land deemed to be utilised on a geophysical basis (Filter 3) the remaining potentially underutilised Māori land totals 5,017ha covering 23 land uses and LUC combinations (Table 4). These 23 scenarios form the base hypothetical models in the next stage of the analysis.

Table 4. Māori land in the Lake Rotorua catchment with, environmental protection areas and land deemed to be utilised given its LUC class, removed.

LUC	Pastoral (Dairy Support)	Cut and Carry	Pastoral (Dry Stock)	Grazed trees	Forestry	Bush and Scrub	Gorse	Total
2	5	17	64	0	3	5	4	99
3	98	26	290	11	221	135	12	793
4	-	-	932	199	423	670	88	2,312
6	-	-	-	-	-	935	301	1,237
7	-	-	-	-	-	470	107	576
Total	103	43	1,286	210	647	2,215	513	5,017

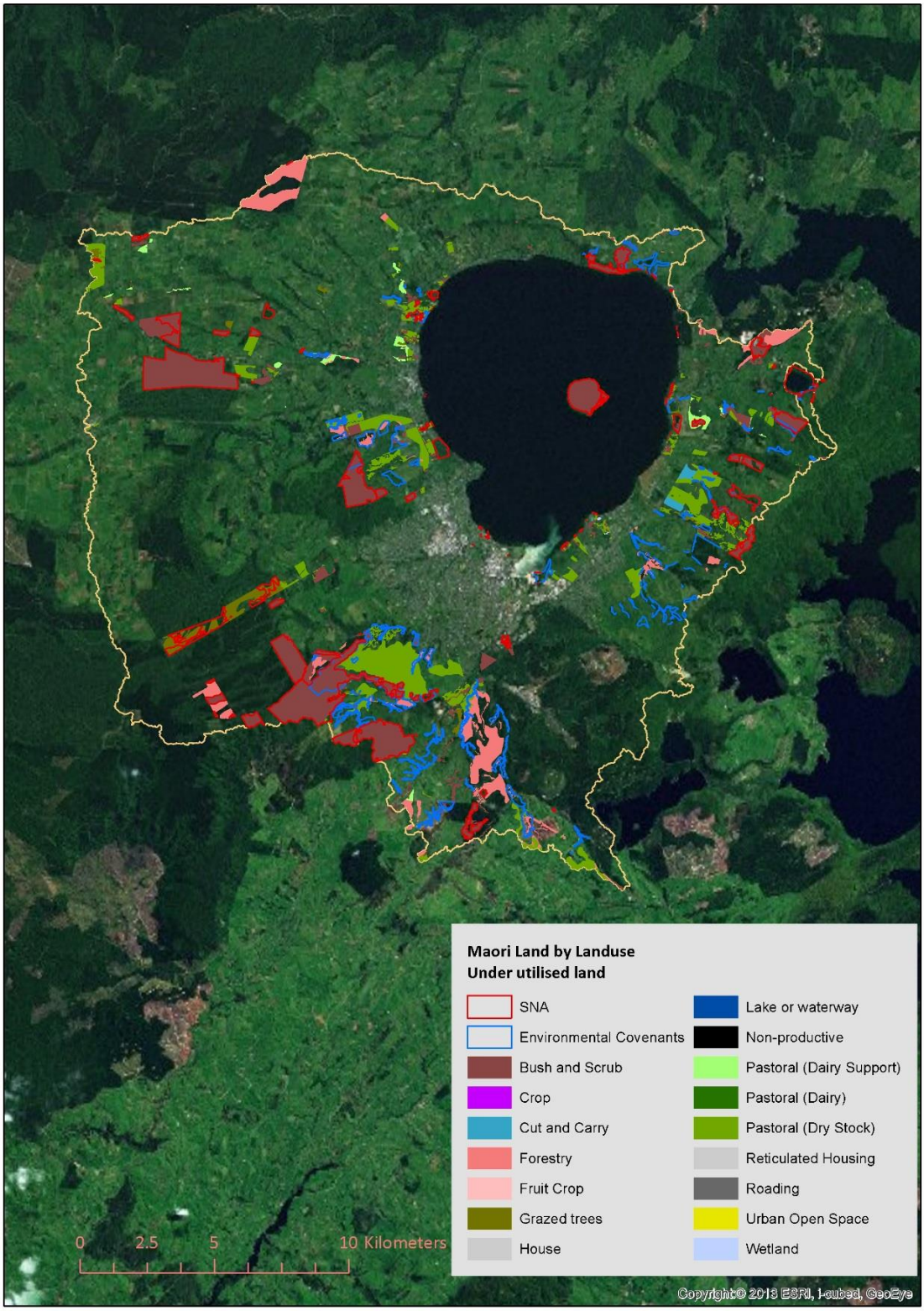

Figure 4. Potentially underutilised Māori land in the lake Rotorua catchment totalling 5,017ha.

4.7. Actual physical GIS data and nitrogen discharge data for each land class deemed underutilised in Table 4 were aggregated and averaged to be used in the hypothetical

base models in the next stage of the analysis. Actual GIS data used in the hypothetical models include:

i) rainfall;

ii) slope;

iii) predominant soil type;

iv) Rule 11 Benchmark;

v) provisional Nitrogen Discharge Allowance (pNDA).

4.8. Of the 5,017ha of potentially underutilised land in the Lake Rotorua catchment, 3,285ha (65.5%) has a formal governance structure and 1,732ha (34.5%) has no known formal governance (Figure 5).

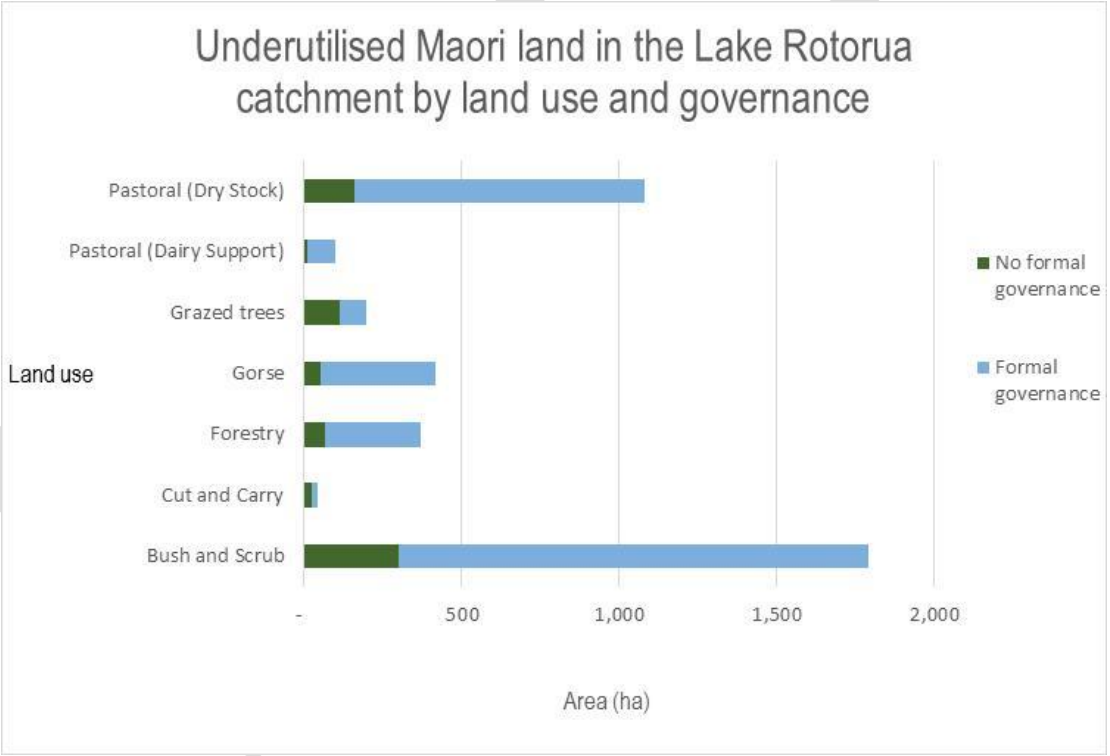

Figure 5. Potentially underutilised Māori land in the Lake Rotorua catchment by governance and land use.

4.9. While it could be argued that for Māori land with a formal governance structure, there may have been a conscious decision made not to convert to an alternative land use, however this is not a determinant of physical or legal utilisation of land for the purpose of this report.

4.10. Significant Natural Area's ("SNA") account for 2,202ha (18.7%) of all Māori land in the catchment. Native bush and scrub accounts for the majority of this SNA area on Māori land at 1,860ha (84.5%).

4.11. While SNA areas are not necessarily restricted from all land use change, it is likely that assessed utilisation will differ depending on who is making this judgement and whether the land is being assessed from a cultural or financial perspective. Consequently these areas would need to be assessed on an individual parcel basis to determine utilisation.

4.12. Comparatively, by removing all Māori land with a formal governance structure or associated SNA, a total of 1,120ha remains (Table 5 and Figure 6).

Table 5. Māori land in the Lake Rotorua catchment excluding covented land, SNA areas and land with a formal governance structure

LUC	Pastoral (Dairy Support)	Cut and Carry	Pastoral (Dry Stock)	Grazed trees	Forestry	Bush and Scrub	Gorse	Total
2	-	15	13	0	-	3	1	31
3	15	7	161	7	182	20	9	401
4	-	-	189	85	158	61	35	529
6	-	-	-	-	-	35	90	126
7	-	-	-	-	-	25	8	34
Total	15	21	363	92	340	145	143	1,120

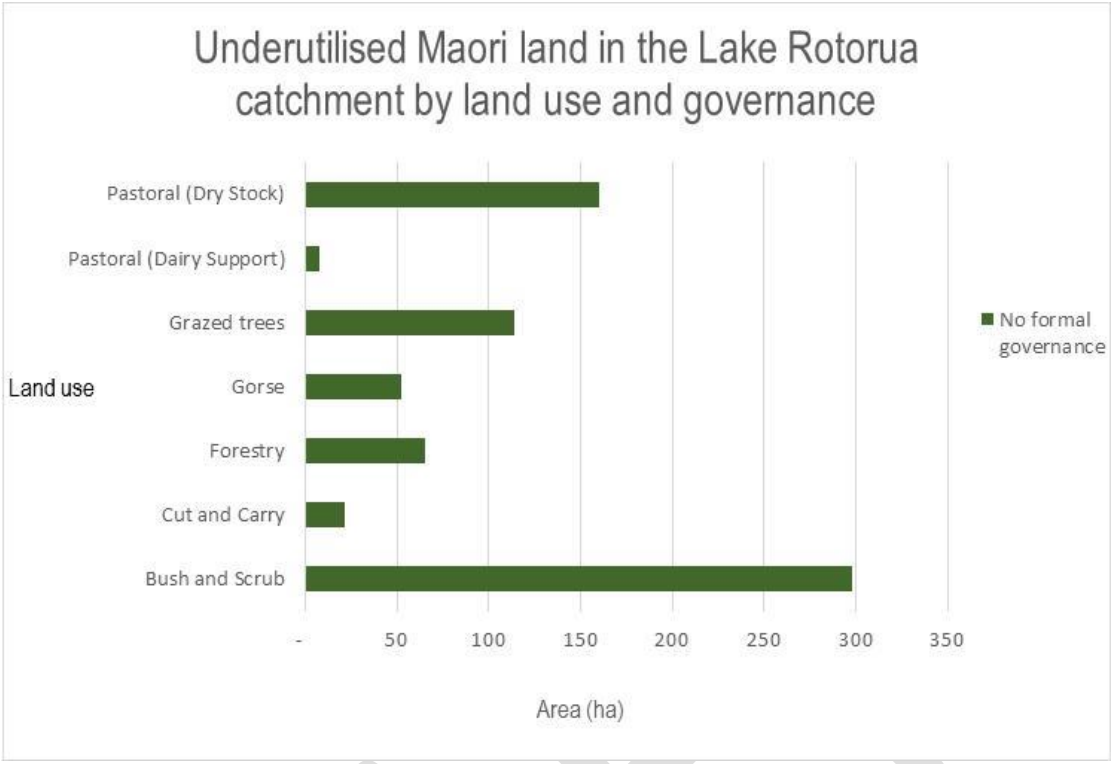

Figure 6. Māori land in the Lake Rotorua catchment excluding covented land, SNA areas and land with a formal governance structure

5. HYPOTHETICAL BASE MODELS

5.1. A total of 23 hypothetical base models were created to represent the 5,017 hectares of underutilised Māori land in the Lake Rotorua catchment.

5.2. The hypothetical base models were loosely based on realistic farm systems regarding accurate pasture growth parameters, mix of operating policies and base productivity indices. The base hypothetical models are briefly outlined below, however details of each model can be found in Figure 7 and the appendices.

5.2.1 Leased pasture (Drystock): There are three drystock base models ranging from LUC 2 to LUC 4 land. These models encapsulate a lamb and steer trading policy with stocking rate based relative to the projected pasture production for each LUC class. Assumed land rental for the drystock base models range from $650/ha on LUC 2 land to $450/ha on LUC 4 land.

5.2.2 Leased pasture (Dairy Support): There are two dairy support base models on LUC 2 and LUC 3 land. These models encapsulate a traditional mix of pastoral heifer and winter cow grazing. Assumed land rental for the dairy support base models are $800/ha on LUC 2 and $700/ha on LUC 3 land.

5.2.3 Leased pasture (Cut and Carry): There are two cut and carry models on LUC 2 and LUC 3 land. These models are based on a strict cut and carry system with no cropping or grazing. Given these operational limitations the assumed rental on these base models is projected below dairy support at $700/ha on LUC 2 and $600/ha on LUC 3 land.

5.2.4 Leased forestry (unowned cutting rights): There are three forestry base models on LUC 2, 3 and 4 land. The lease rental was calculated based on a 15% discount of the projected annuity for each LUC class. Assumed rental ranged from $311/ha on LUC 2 land to $266/ha on LUC 4 land. This is based on the costs associated with establishing the roading infrastructure for the first crop; subsequent crops would have lower infrastructure costs.

5.2.5 Native bush and scrub: There are seven bush and scrub base models ranging from LUC 2 to LUC 7 land. There is no lease rental assumed for this land.

5.2.6 Gorse: There are seven gorse base models ranging from LUC 2 to LUC 7 land. The associated Rule 11 Benchmarks for the gorse models range from 5.6kg

N/ha to 11.7kg N/ha[8]. This suggests a small amount of pastoral grazing was also associated with these blocks, however the assumed lease for these models is $0/ha given there is no grazing on these blocks in the base modelling.

5.2.7 Grazed trees: There are three grazed tree base models ranging from LUC 2 to LUC 4 land. The lease rental was calculated based on the assumed production potential of these areas which was assumed at an 84% reduction to the leased pasture drystock models. The rental for the grazed tree base models ranged from $104/ha on LUC 2 land to $72/ha on LUC 4 land.

5.3. As mentioned in 2.5 above, average physical GIS data of the potentially underutilised land (Figure 7) was used to populate the hypothetical base models in OVERSEER 6.2.1.

5.4. Actual Rule 11 benchmark and pNDA data[9] was also averaged for each hypothetical base model to be used in the next stage of the analysis (Figure 7).

[8] Overseer version 6.2.1.
[9] Migrated to Overseer version 6.2.1.

Underutilised Maori land - Base models							
	Leased pasture (Drystock)	Leased pasture (Dairy support)	Leased Cut and Carry	Leased Forestry (Unowned cutting rights)	Native Bush and Scrub	Gorse	Grazed Trees (lease)
LUC2							
NZSC Soil Order Group Subgroup	RTBP	RTT	RTBP	RTT	LOT	LOT	RTT
Soil type	Kopu_8a.1	Teran_6a.1	Kopu_8a.1	Teran_6a.1	Ngak_15a.1	Ngak_15a.1	Teran_6a.1
Ranfall	1390	1450	1371	1335	1410	1386	1486
Slope	0-8	0-8	0-8	0-8	0-8	0-8	0-8
Benchmark (kg N/ha/yr)	29.5	19.6	24.1	3.1	3.0	11.7	12.9
pNDA (kg N/ha/yr)	23.8	17.1	19.3	3.1	3.0	9.9	12.9
LUC3							
NZSC Soil Order Group Subgroup	LOT	MOT	RTBP	LOV	ZOT	LOT	RTT
Soil type	Ngak_15a.1	Turan_10a.1	Kopu_8a.1	Hapa_2a.1	Mku_1a.1	Ngak_15a.1	Teran_6a.1
Ranfall	1567.0	1618.0	1345.0	1619.0	1592.0	1471.0	1648.0
Slope	8-15	8-15	8-15	8-15	8-15	8-15	8-15
Benchmark (kg N/ha/yr)	23.9	35.1	23.3	2.5	3.0	5.7	12.5
pNDA (kg N/ha/yr)	21.0	28.4	18.6	2.5	3.0	5.6	12.5
LUC4							
NZSC Soil Order Group Subgroup	LOT			ZOT	ZOT	ZOT	ZOT
Soil type	Ngak_15a.1			Mku_1a.1	Mku_1a.1	Mku_1a.1	Mku_1a.1
Ranfall	1585.0			1571.0	1599.0	1599.0	1727.0
Slope	16-20			16-20	16-20	16-20	16-20
Benchmark (kg N/ha/yr)	24.7			2.5	3.0	5.6	4.8
pNDA (kg N/ha/yr)	22.4			2.5	3.0	6.1	4.8
LUC6							
NZSC Soil Order Group Subgroup					ZOT	LOV	
Soil type					Mku_1a.1	Hapa_2a.1	
Ranfall					1574.0	1515.0	
Slope					>26	>26	
Benchmark (kg N/ha/yr)					3.0	8.2	
pNDA (kg N/ha/yr)					3.0	9.5	
LUC7							
NZSC Soil Order Group Subgroup					ZOT	ZOH	
Soil type					Mku_1a.1	Wyma_2a.1	
Ranfall					1637.0	1521.0	
Slope					>26	>26	
Benchmark (kg N/ha/yr)					3.0	6.6	
pNDA (kg N/ha/yr)					3.0	8.4	

Figure 7. Physical and benchmark data for hypothetical base models[10].

5.5. Rule 11 benchmarks range from 23.9kg N/ha to 29.5kg N/ha for drystock base models with pNDA ranging from 21.0kg N/ha to 23.8kg N/ha (Figure 7).

5.6. The range in the Rule 11 benchmark for dairy support base models is greater at 19.6kg N/ha to 34.0kg N/ha with pNDA ranging from 17.1kg N/ha to 27.5kg N/ha.

5.7. Rule 11 Benchmark and pNDA's for the cut and carry base models are significantly higher than the projected leaching from the scenario cut and carry modelling. This is due to the definition of the cut and carry being strictly adhered to in the scenario modelling compared to the reality of these predominant cut and carry blocks which would have likely included some cropping and grazing in the benchmark period.

[10] All Overseer output data in table is from Overseer version 6.2.1.

5.8. While OVERSEER 6.2.1 does not accurately capture potential leaching under gorse, the relativity of the gorse base models to the Rule 11 Benchmark's and pNDA's is still able to be analysed. The base models are projected to leach the same as native bush and scrub 3.0kg N/ha/yr. As mentioned in 5.2.6 above, the associated Rule 11 Benchmark for the gorse base models range from 5.6kg N/ha to 11.7kg N/ha which suggests a small amount of pastoral grazing occurred on these blocks during the benchmark period. Given the grazed contingent of these parcels from the benchmark period will increase to the lower end of the pNDA range, this is why the pNDA on gorse base models LUC 4, LUC 6 and LUC 8 are slightly higher than the Rule 11 benchmark for these blocks.

6. SCENARIO MODELS

6.1. Land use conversion from the hypothetical base models to a range of hypothetical scenario models formed the basis of the financial analysis.

6.2. Similar to the base models, scenario models were loosely based on realistic farm systems regarding accurate pasture growth parameters, mix of operating policies and base productivity indices. Where scenario models and base models align on equivalent LUC classes the assumed operating policy is identical.

6.3. A total of eight land use options were analysed for each base model resulting in a total of 144 scenario models being produced.

6.4. Projected pasture growth potential excluding nitrogen grown feed, differs depending on land use and LUC class (Table 6). Similarly, lease rental for both the base models and scenario models differ depending on land use and LUC class (Table 7).

Table 6. Projected base pasture growth (kg Dry Matter/ha, excluding N grown feed) for base and scenario models.

	Leased pasture (Dairy)	Leased pasture (Drystock)	Leased pasture (Dairy support)	Leased Cut and Carry	Leased Cropping	Leased Forestry	Native Bush and Scrub	Gorse	Tree crop (Leased Manuka)	Grazed Trees (lease)
LUC2	12,500	11,500	11,500	12,500	n/a	n/a	n/a	n/a	n/a	1,840
LUC3	12,500	11,500	11,500	12,500	n/a	n/a	n/a	n/a	n/a	1,840
LUC4	11,500	10,500	10,500	11,500	n/a	n/a	n/a	n/a	n/a	1,680
LUC6	9,000	8,000	8,000	n/a	n/a	n/a	n/a	n/a	n/a	1,280
LUC7	n/a	7,000	7,000	n/a	n/a	n/a	n/a	n/a	n/a	n/a

Table 7. Projected lease rentals

	Leased pasture (Dairy)	Leased pasture (Drystock)	Leased pasture (Dairy support)	Leased Cut and Carry	Leased Cropping	Leased Forestry	Native Bush and Scrub	Gorse	Tree crop (Leased Manuka)	Grazed Trees (lease)
LUC2	$ 1,000	$ 650	$ 800	$ 700	$ 900	$ 245	$ -	$ -	$ 100	$ 104
LUC3	$ 900	$ 550	$ 700	$ 600	$ 800	$ 227	$ -	$ -	$ 100	$ 88
LUC4	$ 800	$ 450	$ 600	$ 500	$ 700	$ 173	$ -	$ -	$ 100	$ 72
LUC6	$ 600	$ 250	$ 400	$ -	$ -	$ 133	$ -	$ -	$ 100	$ 40
LUC7	$ -	$ 200	$ 200	$ -	$ -	$ 42	$ -	$ -	$ 100	$ -

6.5. Parameters of the scenario models are further summarised below:

6.5.1. **Leased pasture (Dairy):**

(i) Stocking rate on the leased pasture dairy scenario models range from 3.3 crossbred cows[11] per hectare on LUC 2 land to 2.6 cows per hectare on LUC 6 land.

(ii) Milk solids production totals 350kg MS/cow in all models.

(iii) All young stock are assumed to be grazed off farm from weaning to 1 May as R2 heifers in all models.

(iv) All cows are assumed to be wintered off farm in all models from 1 June to 31st July.

(v) Silage made on platform ranges from an average of 1.0t/ha of on LUC2 and LUC 3 land to 0t/ha on LUC 6 land. All silage fed out on property.

(vi) Nitrogen fertilised applied totals 152kg N/ha for all dairy models being 4 applications of 38kg N/ha with no nitrogen applied from May to July.

(vii) Imported supplement totals 1.0t PKE per hectare in all dairy models.

(viii) No cropping is assumed in dairy models.

6.5.2. **Leased pasture (Drystock):**

(i) All drystock models are assumed to be operated as part of lamb and steer finishing operations.

(ii) Lambs are assumed to be purchased in December at 30kg live weight and finished at 42kg live weight between January and June. Stocking rate ranges from 16 lambs per hectare on LUC 2 land to 10 lambs per hectare on LUC 7 land.

(iii) Steers are assumed to be purchased in March at 250kg liveweight and taken through and finished at 550kg liveweight as 2 year olds. Stocking rate ranges from 1.5 steers per hectare on LUC 2 land to 0.9 steers per hectare on LUC 7 land.

(iv) Silage is assumed to be harvested on LUC 2 and 3 land at an average of 0.3t DM/ha. All silage fed out on property.

[11] Crossbred cow liveweight assumed at 480kg.

(v) A total of 10kg N/ha is assumed to be applied as nitrogen fertiliser to all drystock models.

(vi) No cropping is assumed in drystock models.

6.5.3. Leased pasture (Dairy Support):

(i) Dairy support models are based off a traditional mix of winter cows for 8 weeks and heifer grazing from weaning at 1 December through to 1 May as R2 heifers.

(ii) Stocking rates of 2.0 crossbred heifers per hectare and 3.5 crossbred cows per hectare are assumed on LUC 2 land through to 1.5 heifers per hectare and 1.2 cows per hectare on LUC 6 land.

(iii) Silage made ranges from an average of 1t/ha of on LUC2 and LUC 3 land to 0t/ha on LUC 6 land. All silage fed out on property.

(iv) A total of 50kg N/ha is assumed to be applied annually in 2 applications in each dairy support model.

(v) No cropping is assumed in dairy support models.

6.5.4. Leased pasture (Cut and Carry):

(i) Cut and carry models are based on all pasture being harvested and exported off farm.

(ii) A total of 80kg N/ha of nitrogen fertiliser is applied annually in all models.

(iii) No cropping is assumed in cut and carry models.

(iv) Given cut and carry models are assumed to include no grazing, lease rental is reduced by $100/ha relative to the equivalent dairy support model.

6.5.5. Leased pasture (Cropping)

(i) Cropping models assume maize grown for silage yielding 22t DM/ha with all maize being exported off farm.

(ii) Annual ryegrass is assumed to be planted following the maize with all pasture silage exported off farm.

(iii) A total of 264kg N/ha (12kg N per ton DM maize) of nitrogen fertiliser is applied to the maize crop with a total of 61kg N/ha applied to pasture silage crop.

(iv) No grazing occurs on cropping models.

6.5.6. **Leased forestry:**

(i) The scenario models for leased forestry assume land is leased for a minimum period of 26 years for the purpose of production *Pinus radiata* managed under a structural grade regime.

(ii) The lessee is responsible for all costs associated with establishing, maintaining, and harvesting the crop and receives all timber revenues. However it is assumed the land owner clears the land to a suitable state for planting.

(iii) Lease values have been initially established by way of calculating potential annuities for each LUC class at an 8% discount rate. A reduction of 15% from the projected annuity has been assumed as a risk margin to ascertain what a potential lessee may be willing to pay. Small scale woodlots have been assumed when assessing production and costs. Table 8 summarises the annuities and corresponding leases which have been assumed. Full details of the annuity calculations can be found in Appendix 10.25.

Table 8. Summary of forestry annuities and corresponding potential lease rentals

LUC	300 Index	Slope (degrees)	Annual costs (incl	HTR	Annuity	Risk margin for lease	Lease
2	36.9	5	80	$ 50	$ 288	15%	$ 245
3	36.5	10	75	$ 52	$ 267	15%	$ 227
4	36.1	20	70	$ 58	$ 204	15%	$ 173
6	35.3	30	65	$ 63	$ 157	15%	$ 133
7	34.9	35	60	$ 73	$ 49	15%	$ 42

(iv) Projected lease rentals were then cross referenced with actual lease rentals in the central north island. Considering the actual lease examples differed in terms of the management structure and scale, they broadly aligned with the lease rentals projected in Table 8.

6.5.7. **Native bush:**

(i) These scenario models assume retiring land into native bush and scrub with no associated rental.

(ii) It is assumed the land owner is responsible for the cost of clearing land where required and planting costs.

(iii) It is assumed that the land owner does not claim the AGS for native bush retirement for the reasons outlined in the methodology.

6.5.8. **Leased Manuka:**

(i) Leased Manuka models assume land is leased for a minimum period of 23 years for the purpose of apiculture (Manuka honey).

(ii) Similar to the forestry model it is assumed the lessee is responsible for all costs associated with establishing and maintaining the Manuka crop. However it is assumed the land owner clears the land to a suitable state for the lessee to commence planting.

(iii) Given the complexity and multiple assumptions required to project annuities for Manuka honey, lease rentals have been based upon information from Comvita around potential market rental for bare land to be planted in Manuka for apiculture. Comvita projects market rental for this type of lease at $80-100/ha excluding any impacts of carbon trading.

6.5.9. Details of conversion costs for each scenario model are presented in the Appendices 10.1 to 10.23.

7. RESULTS

7.1. Financial analysis in relation to land use change of underutilised Māori land in the Lake Rotorua catchment was assessed by analysing the change in profitability from converting underutilised land (base models) to the most profitable land use alternative (scenario models).

7.2. This change in profitability was compared under three starting points to differentiate between various nitrogen discharge restrictions to assess the impact of the Draft Nutrient Rules on profitability. The three starting points for the financial analysis were:

i) Prior to Rule 11 (excluding all nitrogen discharge rules or incentives);

ii) Post Rule 11 but prior to the Draft Nutrient Rules;

iii) Post the Draft Nutrient Rules.

7.3. **Prior to Rule 11.** The first stage of the financial analysis was to assess the implications on net profitability when converting each of the base models to eight potential land use options prior to Rule 11.

7.3.1. As per the scope of the RFQ, the change in operating profitability (EBIT) from the land use conversion was assessed by comparing the change in projected rental for each land use.

7.3.2. The next step was to assess the capital conversion cost to the land owner of converting to each potential land use option.

7.3.3. Physical conversion costs were largely dependent on existing land use and contour.

7.3.4. The net capital cost of conversion was then discounted at a rate of 8% to give the annual opportunity cost of the capital investment required.

7.3.5. The change in net profitability for each land use change prior to Rule 11 was calculated by combining the change in operating profitability (lease rental) with the annual opportunity cost of the capital investment. These results are presented in Table 9.

Table 9. Change in net profitability per hectare per year when converting underutilised Māori land to a range of proposed land uses **prior to Rule 11**.

	Proposed land use							
Hypothetical base model	Leased pasture (Dairy)	Leased pasture (Drystock)	Leased pasture (Dairy support)	Leased Cut and Carry	Leased Cropping	Leased Forestry (Unowned cutting rights)	Native Bush and Scrub	Tree crop (Leased Manuka)
Leased Pasture (Drystock) LUC 2	$ 98		$ 116	$ (1)	$ 199	$ (413)	$ (858)	$ (558)
Leased Pasture (Drystock) LUC 3	$ 98		$ 116	$ (1)	$ 199	$ (331)	$ (758)	$ (458)
Leased Pasture (Drystock) LUC 4	$ 98		$ 116			$ (285)	$ (658)	$ (358)
Leased Pasture (Dairy Support) LUC 2	$ (31)	$ (262)		$ (130)	$ 70	$ (563)	$ (1,008)	$ (708)
Leased Pasture (Dairy Support) LUC 3	$ (31)	$ (262)		$ (130)	$ 70	$ (481)	$ (908)	$ (608)
Leased Pasture (Cut & Carry) LUC 2	$ 82	$ (120)	$ 72		$ 192	$ (463)	$ (908)	$ (608)
Leased Pasture (Cut & Carry) LUC 3	$ 82	$ (120)	$ 72		$ 192	$ (381)	$ (808)	$ (508)
Forestry LUC 2	$ 277	$ (33)	$ 189	$ 141	$ 421		$ (505)	$ (205)
Forestry LUC 3	$ 194	$ (115)	$ 107	$ 59	$ 339		$ (487)	$ (187)
Forestry LUC 4	$ 148	$ (162)	$ 61				$ (434)	$ (134)
Bush & Scrub LUC 2	$ 521	$ 212	$ 434	$ 386	$ 666	$ 184		$ 40
Bush & Scrub LUC 3	$ 421	$ 112	$ 334	$ 286	$ 566	$ 167		$ 40
Bush & Scrub LUC 4	$ 321	$ 12	$ 234			$ 113		$ 40
Bush & Scrub LUC 6	$ (9)	$ (314)	$ (91)			$ 37		$ 4
Bush & Scrub LUC 7						$ (55)		$ 4
Gorse LUC 2	$ 556	$ 295	$ 469	$ 386	$ 666	$ 184	$ (260)	$ 40
Gorse LUC 3	$ 456	$ 195	$ 369	$ 286	$ 566	$ 167	$ (260)	$ 40
Gorse LUC 4	$ 321	$ 12	$ 234			$ 113	$ (260)	$ 40
Gorse LUC 6	$ (9)	$ (314)	$ (91)			$ 37	$ (296)	$ 4
Gorse LUC 7						$ (55)		$ 4
Grazed trees LUC 2	$ 406	$ 98	$ 316	$ 288	$ 550	$ 80	$ (364)	$ (64)
Grazed trees LUC 3	$ 322	$ 14	$ 232	$ 204	$ 466	$ 79	$ (348)	$ (48)
Grazed trees LUC 4	$ 238	$ (70)	$ 148			$ 41	$ (332)	$ (32)

7.3.6. The gorse clearing incentive was not included in the calculations in Table 9 as this incentive is a by-product of the ROTAN modelling target to remove 320 tons of nitrogen from Lake Rotorua. Table 9 essentially captures the change in profitability from converting underutilised Māori land to a range of land use options prior to any nitrogen rules or incentives.

7.3.7. Where the LUC of the land was not suited to a proposed land use that land use conversion was not modelled.

7.3.8. Net profit varies greatly depending on the existing land use, LUC class and conversion costs for each proposed land use.

7.3.9. On average across all base models, conversion to cropping is the most profitable land use change, followed by dairy then dairy support. This is partly due to cropping only being suitable on LUC 2 and LUC 3 land but also due to the relatively low conversion cost associated with converting to cropping compared to grazed pasture systems.

7.3.10. When converting from pastoral land to forestry, native bush and scrub or Manuka there was a negative change in profitability in all instances. This is due to the relatively large decrease in operating profitability (rental) outweighing the impact on annual profitability from capital afforestation grants.

7.3.11. When converting out of non-pastoral models net profitability was often positive given the lower starting point of the operating profit**.**

7.4. **Under Rule 11.** The second stage of the financial analysis was to assess the change in net profitability when converting each hypothetical base model to the eight potential land use options under Rule 11.

7.4.1. Under Rule 11, properties within the Lake Rotorua catchment are constrained by a property specific nitrogen discharge restriction which cannot be exceeded. This system inevitably results in potential nitrogen liabilities or surpluses when land use is altered.

7.4.2. While it is possible to trade nitrogen under Rule 11D, there is not necessarily a market for traded nitrogen under Rule 11 in the current environment, thus limiting the ability for the value of nitrogen liabilities or surpluses to be realised.

7.4.3. For comparative purposes, the impacts on profitability from land use change under Rule 11 have been assessed assuming two scenarios:

(i) Tradeable nitrogen has a value equivalent to the projected value under the Draft Nutrient Rules at $210/kg N.

(ii) There is no market for tradeable nitrogen.

7.4.4. Assuming N is traded at $210/kg N under Rule 11, dairy becomes the most unprofitable land use conversion option under Rule 11 followed by drystock then dairy support (Table 10). This is due to the relatively high nitrogen leaching and consequent nitrogen liability under these land use options when compared to other land use options.

7.4.5. Under these parameters conversion to Cut and Carry is the most profitable land use conversion option followed by Forestry then Manuka. Cut and Carry is the most profitable land use conversion option as it has a relatively small nitrogen footprint relative to its operating profit. However as seen below, cut and carry is only a potential conversion option on LUC 2 and LUC 3 land. On LUC 4 to LUC 7 land conversion to Forestry is the most profitable option followed by Manuka.

Table 10. Change in net profitability per hectare per year when converting underutilised Māori Land to a range of land use options under Rule 11 **(assuming value of traded nitrogen at $210/kg N).**

Hypothetical base model	Leased pasture (Dairy)	Leased pasture (Drystock)	Leased pasture (Dairy support)	Leased Cut and Carry	Leased Cropping	Leased Forestry (Unowned cutting rights)	Native Bush and Scrub	Tree crop (Leased Manuka)
Leased Pasture (Drystock) LUC 2	$ (256)		$ 69	$ 399	$ (5)	$ 40	$ (413)	$ (113)
Leased Pasture (Drystock) LUC 3	$ (153)		$ 51	$ 303	$ (73)	$ 28	$ (407)	$ (107)
Leased Pasture (Drystock) LUC 4	$ (126)		$ 82			$ 89	$ (293)	$ 7
Leased Pasture (Dairy Support) LUC 2	$ (463)	$ (259)		$ 110	$ (248)	$ (276)	$ (729)	$ (429)
Leased Pasture (Dairy Support) LUC 3	$ (559)	$ (16)		$ 337	$ (335)	$ 66	$ (369)	$ (69)
Leased Pasture (Cut & Carry) LUC 2	$ (330)	$ (65)	$ (51)		$ (83)	$ (100)	$ (553)	$ (253)
Leased Pasture (Cut & Carry) LUC 3	$ (320)	$ (63)	$ (29)		$ (71)	$ (32)	$ (468)	$ (168)
Forestry LUC 2	$ (341)	$ (278)	$ (195)	$ 109	$ (71)		$ (504)	$ (204)
Forestry LUC 3	$ (628)	$ (429)	$ (361)	$ (2)	$ (380)		$ (496)	$ (196)
Forestry LUC 4	$ (848)	$ (498)	$ (502)				$ (442)	$ (142)
Bush & Scrub LUC 2	$ (98)	$ (35)	$ 60	$ 355	$ 188	$ 193		$ 39
Bush & Scrub LUC 3	$ (610)	$ (266)	$ (246)	$ 217	$ (345)	$ 175		$ 40
Bush & Scrub LUC 4	$ (685)	$ (322)	$ (327)			$ 122		$ 40
Bush & Scrub LUC 6	$ (786)	$ (561)	$ (480)			$ 46		$ 4
Bush & Scrub LUC 7						$ (55)		$ 4
Gorse LUC 2	$ 101	$ 200	$ 241	$ 503	$ 354	$ 700	$ 246	$ 546
Gorse LUC 3	$ (54)	$ (18)	$ 27	$ 287	$ (90)	$ 580	$ 144	$ 444
Gorse LUC 4	$ (642)	$ (279)	$ (284)			$ 525	$ 143	$ 443
Gorse LUC 6	$ (414)	$ (406)	$ (265)			$ 493	$ 152	$ 452
Gorse LUC 7						$ 374		$ 424
Grazed trees LUC 2	$ (177)	$ (22)	$ 33	$ 405	$ 62	$ 256	$ (197)	$ 102.63
Grazed trees LUC 3	$ (389)	$ (141)	$ (88)	$ 308	$ 149	$ 247	$ (188)	$ 112
Grazed trees LUC 4	$ (813)	$ (399)	$ (412)			$ 80	$ (302)	$ (2)

7.4.6. Where it is assumed there is no market for traded nitrogen under Rule 11, the resulting assumptions are that land can only be converted to another land use with nitrogen leaching equal to, or less than, the properties Rule 11 Benchmark. This eliminates most of pastoral land uses as conversion options and decreases profitability from converting to non-pastoral land uses (Table 11).

Table 11. Change in net profitability per hectare per year when converting underutilised Māori Land to a range of land use options under Rule 11 **(assuming no market for traded nitrogen)**

	Proposed land use							
Hypothetical base model	Leased pasture (Dairy)	Leased pasture (Drystock)	Leased pasture (Dairy support)	Leased Cut and Carry	Leased Cropping	Leased Forestry (Unowned cutting rights)	Native Bush and Scrub	Tree crop (Leased Manuka)
Leased Pasture (Drystock) LUC 2				$ (1)		$ (413)	$ (858)	$ (558)
Leased Pasture (Drystock) LUC 3				$ (1)		$ (331)	$ (758)	$ (458)
Leased Pasture (Drystock) LUC 4				$ -		$ (285)	$ (658)	$ (358)
Leased Pasture (Dairy Support) LUC 2		$ (262)		$ (130)		$ (563)	$ (1,008)	$ (708)
Leased Pasture (Dairy Support) LUC 3		$ (262)		$ (130)		$ (481)	$ (908)	$ (608)
Leased Pasture (Cut & Carry) LUC 2						$ (463)	$ (908)	$ (608)
Leased Pasture (Cut & Carry) LUC 3						$ (381)	$ (808)	$ (508)
Forestry LUC 2							$ (505)	$ (205)
Forestry LUC 3							$ (487)	$ (187)
Forestry LUC 4							$ (434)	$ (134)
Bush & Scrub LUC 2						$ 184		$ 40
Bush & Scrub LUC 3						$ 167		$ 40
Bush & Scrub LUC 4						$ 113		$ 40
Bush & Scrub LUC 6						$ 37		$ 4
Bush & Scrub LUC 7						$ (55)		$ 4
Gorse LUC 2						$ 544	$ 100	$ 400
Gorse LUC 3						$ 527	$ 100	$ 400
Gorse LUC 4						$ 473	$ 100	$ 400
Gorse LUC 6						$ 397	$ 64	$ 364
Gorse LUC 7						$ 305		$ 364
Grazed trees LUC 2						$ 80	$ (364)	$ (64)
Grazed trees LUC 3						$ 79	$ (348)	$ (48)
Grazed trees LUC 4						$ 41	$ (332)	$ (32)

7.5. **Draft Nutrient Rules**. The third stage was to assess the change in profitability from converting underutilised Māori land to each potential land use option under the Draft Nutrient Rules (Table 12).

7.5.1. Given nitrogen leaching allowances are generally lower under the Draft Nutrient Rules than Rule 11, nitrogen liability increases when converting to a land use with a higher nitrogen footprint or results in less nitrogen to be sold when converting to a land use with a lower nitrogen footprint.

7.5.2. Under these parameters, conversion to Cut and Carry is again the most profitable land use conversion option followed by Forestry then Manuka. Conversion to dairy is the least profitable land use conversion option under the Draft Nutrient Rules due to its high nitrogen footprint (Table 12).

Table 12. Change in net annual profitability per hectare per year from converting underutilised Māori land to a range of land use options **under the Draft Nutrient Rules**

	Proposed land use							
Hypothetical base model	Leased pasture (Dairy)	Leased pasture (Drystock)	Leased pasture (Dairy support)	Leased Cut and Carry	Leased Cropping	Leased Forestry (Unowned cutting rights)	Native Bush and Scrub	Tree crop (Leased Manuka)
Leased Pasture (Drystock) LUC 2	$ (350)		$ (25)	$ 304	$ (100)	$ (55)	$ (508)	$ (208)
Leased Pasture (Drystock) LUC 3	$ (202)		$ 2	$ 254	$ (122)	$ (20)	$ (456)	$ (156)
Leased Pasture (Drystock) LUC 4	$ (166)		$ 43			$ 49	$ (333)	$ (33)
Leased Pasture (Dairy Support) LUC 2	$ (505)	$ (301)		$ 68	$ (290)	$ (318)	$ (771)	$ (471)
Leased Pasture (Dairy Support) LUC 3	$ (672)	$ (129)		$ 225	$ (447)	$ (47)	$ (482)	$ (182)
Leased Pasture (Cut & Carry) LUC 2	$ (411)	$ (146)	$ (132)		$ (164)	$ (181)	$ (634)	$ (334)
Leased Pasture (Cut & Carry) LUC 3	$ (398)	$ (141)	$ (107)		$ (149)	$ (111)	$ (546)	$ (246)
Forestry LUC 2	$ (341)	$ (278)	$ (195)	$ 109	$ (71)		$ (504)	$ (204)
Forestry LUC 3	$ (628)	$ (429)	$ (361)	$ (2)	$ (380)		$ (496)	$ (196)
Forestry LUC 4	$ (849)	$ (498)	$ (502)				$ (442)	$ (142)
Bush & Scrub LUC 2	$ (98)	$ (35)	$ 60	$ 355	$ 188	$ 193		$ 39
Bush & Scrub LUC 3	$ (610)	$ (266)	$ (246)	$ 217	$ (345)	$ 175		$ 40
Bush & Scrub LUC 4	$ (685)	$ (322)	$ (327)			$ 122		$ 40
Bush & Scrub LUC 6	$ (786)	$ (561)	$ (480)			$ 46		$ 3.94
Bush & Scrub LUC 7						$ (55)		$ 4
Gorse LUC 2	$ 71	$ 169	$ 211	$ 472.35	$ 324	$ 669	$ 216	$ 516
Gorse LUC 3	$ (55)	$ (19)	$ 26	$ 286	$ (91)	$ 579	$ 143	$ 443
Gorse LUC 4	$ (633)	$ (271)	$ (275)			$ 533	$ 151	$ 451
Gorse LUC 6	$ (394)	$ (385)	$ (245)			$ 514	$ 172	$ 472
Gorse LUC 7						$ 405		$ 455
Grazed trees LUC 2	$ (177)	$ (22)	$ 33	$ 405	$ 62	$ 256	$ (197)	$ 103
Grazed trees LUC 3	$ (389)	$ (141)	$ (88)	$ 308	$ 149	$ 247	$ (188)	$ 112
Grazed trees LUC 4	$ (813)	$ (399)	$ (412)			$ 80	$ (302)	$ (2)

7.6. Comparing the difference in profitability between the most profitable land use change prior to Rule 11 and the most profitable land use change under the Draft Nutrient Rules gives one perspective of the financial impact of the Draft Nutrient Rules (Appendix 10.24).

7.6.1. For example, under the Drystock – LUC 2 base model, the most profitable land use conversion option prior to Rule 11 is conversion to Cropping, where an increase in total profitability of $199/ha/yr is estimated (Table 13).

7.6.2. However once the effect of nitrogen limit is taken into account under the Draft Nutrient Rules, Cut and Carry then becomes the most profitable land use conversion option with an estimated increase in total profit of $304/ha/yr (Table 13). This is due in part to the potential ability to sell an NDA surplus under this production system.

7.6.3. Therefore, assuming the most profitable land use conversion option prior to Rule 11 would have been otherwise adopted, the impact of implementing the Draft Nutrient Rules would be an increase of $105/ha/yr in total profit (Table 13).

7.7. However, the assumed starting point of this comparison will have a significant impact on the assessed impact of the Draft Nutrient Rules.

7.7.1. Assuming the most profitable land use conversion post Rule 11 would have been otherwise adopted, the impact of the Draft Nutrient Rules on the Drystock – LUC 2 base model would be a decrease in total profit of ($95)/ha assuming nitrogen is traded at $210/kg N (Table 13).

Table 13. Impact of the Draft Nutrient Rules on profitability from implementing the most profitable land use change.

	Proposed land use							
Hypothetical base model	Leased pasture (Dairy)	Leased pasture (Drystock)	Leased pasture (Dairy support)	Leased Cut and Carry	Leased Cropping	Leased Forestry (Unowned cutting rights)	Native Bush and Scrub	Tree crop (Leased Manuka)
Leased Pasture (Drystock) LUC 2								
Δ in total profitability prior to Rule 11 ($/ha/yr)	$ 98		$ 116	$ (1)	$ 199	$ (413)	$ (858)	$ (558)
Δ in total profitability under Rule 11 assumming N trading ($/ha/yr)	$ (256)		$ 69	$ 399	$ (5)	$ 40	$ (413)	$ (113)
Δ in total profitability under pNDA ($/ha/yr)	$ (350)		$ (25)	$ 304	$ (100)	$ (55)	$ (508)	$ (208)
Δ in profitability Δ assuming most profitable conversion otherwise adopted ($/ha)	**$ (550)**		**$ (225)**	**$ 105**	**$ (299)**	**$ (254)**	**$ (707)**	**$ (407)**
Δ assuming most profitable conversion under Rule 11 otherwise adopted ($/ha)	**$ (749)**		**$ (424)**	**$ (95)**	**$ (499)**	**$ (454)**	**$ (907)**	**$ (607)**

7.8. The impact of the Draft Nutrient Rules are significantly greater across the base models when a starting point prior to Rule 11 is assumed compared to a starting point post Rule 11 (Figure 8). This is the result of the impact of capital nitrogen already being accounted for under Rule 11, thus resulting in the Draft Nutrient Rules having a lesser impact when compared to a starting point prior to Rule 11.

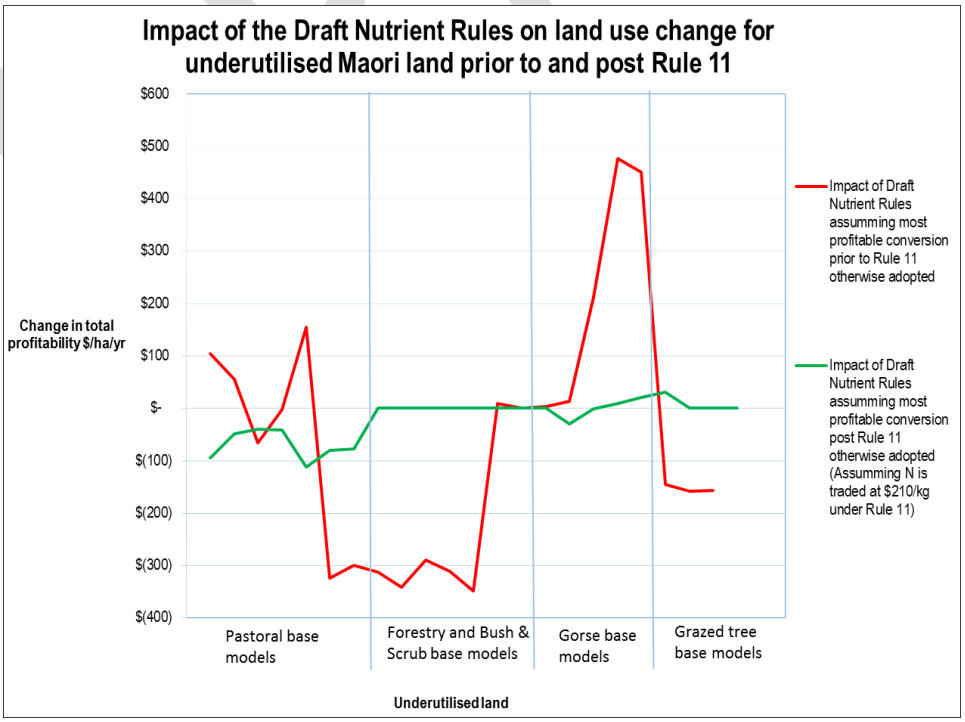

Figure 8. Impact of the Draft Nutrient Rules as it relates to land use change on underutilised Māori land in the Lake Rotorua catchment under two different starting points; prior to and post Rule 11.

7.9. When assessing the impacts of the Draft Nutrient Rules post Rule 11 (assuming there is an existing market for tradeable N loss rights), there is a clear decrease in profitability for all pastoral base models, there is essentially no effect on profitability for the Forestry and Bush and Scrub base models and no significant trend for the Gorse and Grazed Tree base models.

7.10. It is important to note that the change in profitability curves shown in Figure 8 are:

(i) Red: The difference in profitability between the most profitable land use change under the Draft Nutrient Rules and the most profitable land use change prior to Rule 11.

(ii) Green: The difference in profitability between the most profitable land use change under the Draft Nutrient Rules and the most profitable land use change post Rule 11 assuming nitrogen is already tradeable at $210/kg N.

7.11. To gain an accurate understanding of the total impact of the Draft Nutrient Rules at catchment level, further analysis would be required of individual blocks to assess suitability of proposed land use change.

7.12. However, assuming the 5,017 hectares of potentially underutilised Māori land identified in Table 4 was in fact underutilised and the most profitable land use conversion option was able to be adopted in each scenario, the total change in annual profitability under Rule 11 assuming tradable nitrogen, is in the vicinity of an increase of $656,826/yr (Figure 9) or $131/ha/yr.

7.13. Under the Draft Nutrient Rules, the total change in annual profitability is in the vicinity of $598,895/yr, thus equating to a net annual cost of ($57,931)/yr or ($12)/ha/yr when implementing the Draft Nutrient Rules assuming a starting point post Rule 11 (Figure 9).

7.14. However, if it is assumed there is no market for tradeable nitrogen under Rule 11, the total change in annual profitability from implementing the most profitable land use change under Rule 11 is in the vicinity of $356,035/yr thus equating to a net annual benefit in the vicinity of $242,860/yr or $48/ha/yr when implementing the Draft Nutrient Rules (Figure 9).

7.15. When assessing the net cost of the draft nutrient rules from a starting point prior to Rule 11, the annual cost of the draft nutrient rules are projected to be in the vicinity of ($179,033)/yr or ($36)/ha/yr assuming the most profitable land use conversion was adopted in all instances.

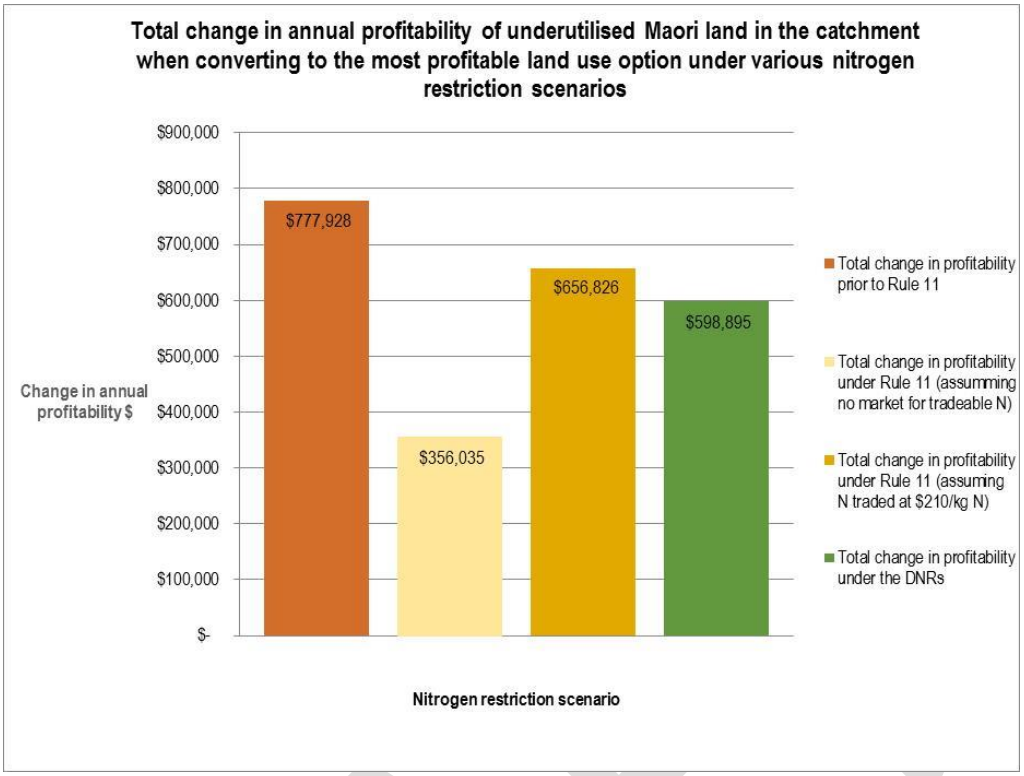

Figure 9. Total change in annual profitability for 5,017ha of potentially underutilised Māori land in the lake Rotorua catchment assuming various nitrogen restriction scenarios and a traded nitrogen price of **$210/kg N**.

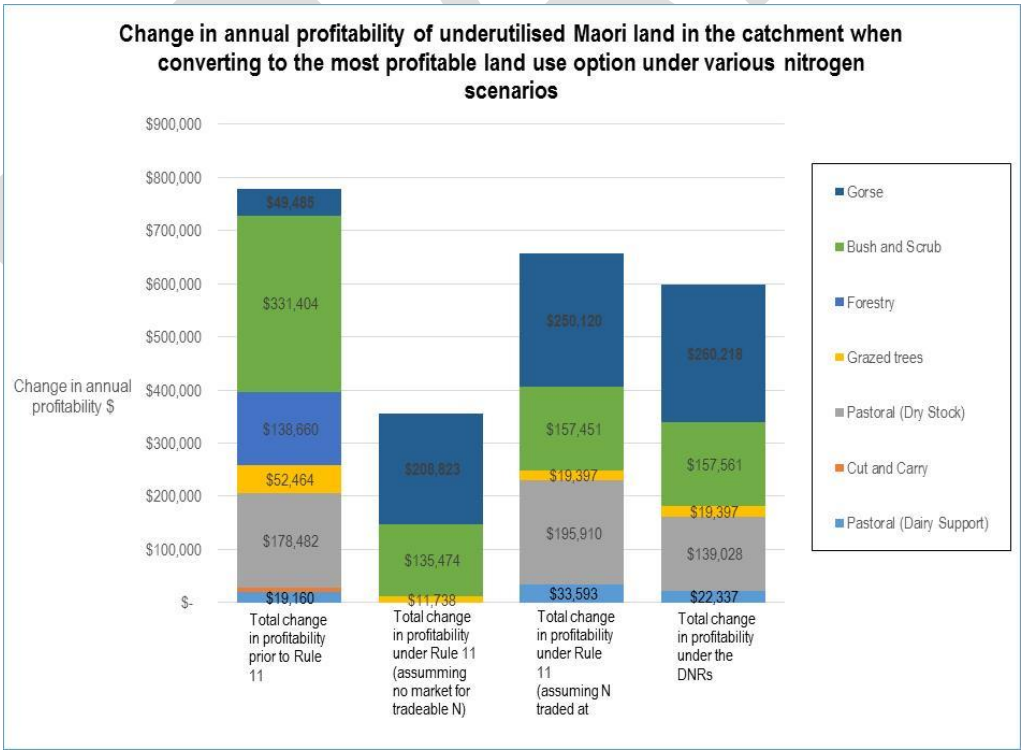

Figure 10. Change in annual profitability by land use for 5,017ha of potentially underutilised Māori land in the lake Rotorua catchment assuming various nitrogen restriction scenarios and a traded nitrogen price of $210/kg N.

7.16. These results clearly demonstrate that the ability to freely trade nitrogen loss rights has a significant impact on profitability of land use change when assessing nitrogen limiting nutrient rules.

7.17. As the value of traded nitrogen decreases below $210/kg N, so too does the total change in annual profitability (of the 5,017ha of underutilised land) from adopting the most profitable land use change under Rule 11 and the draft nutrient rules.

7.18. However, once the value of traded nitrogen falls below $75/kg N (Figure 11) the change in profitability under both Rule 11 and the draft nutrient rules then begins to increase. This is due to the higher N leaching pastoral alternatives progressively becoming more profitable as the value of traded N decreases.

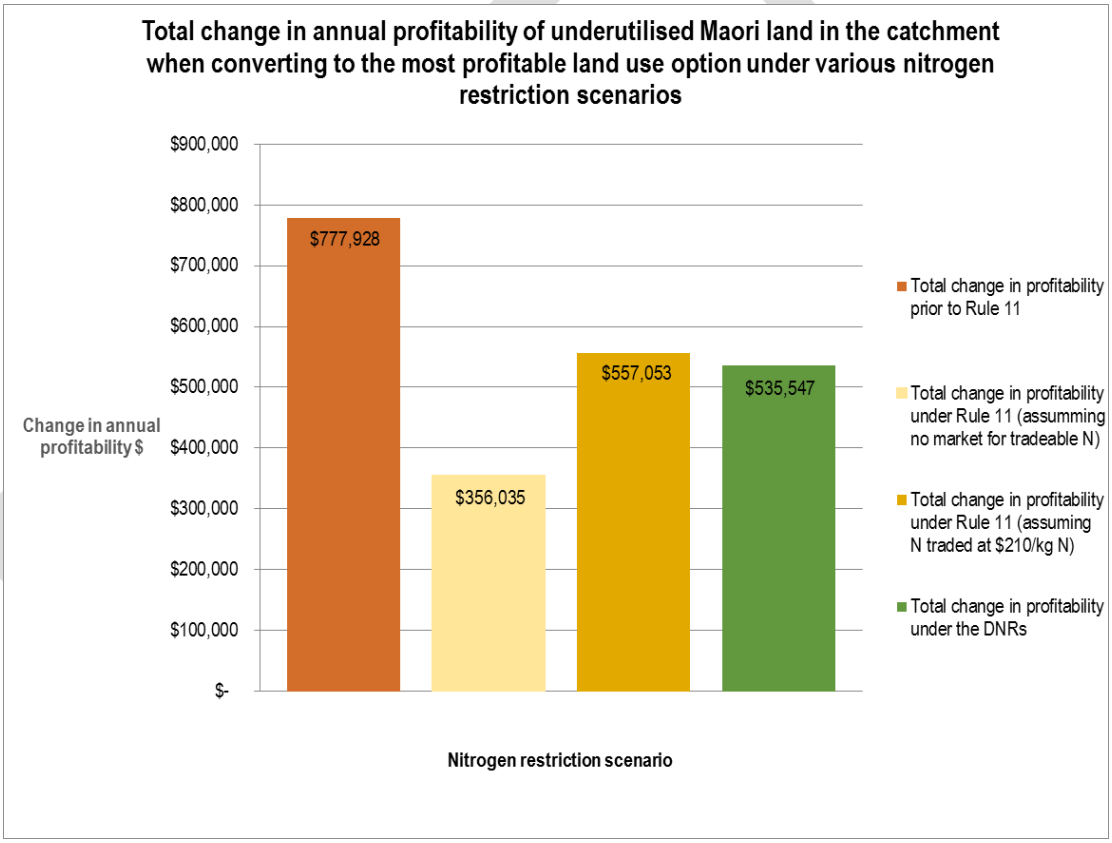

Figure 11. Total change in annual profitability for 5,017ha of potentially underutilised Māori land in the lake Rotorua catchment assuming various nitrogen restriction scenarios and a traded nitrogen price of **$75/kg N**.

7.19. Similarly, as the price of traded N increases above $210/kg N so too does the total change in profitability (of the 5,017ha of underutilised land) from adopting the most profitable land use change under Rule 11 and the draft nutrient rules. Should the value of traded nitrogen reach $284/kg N there is projected to be no difference between the

total change in profitability prior to Rule 11 and the total change in profitability under the draft nutrient rules (Figure 12).

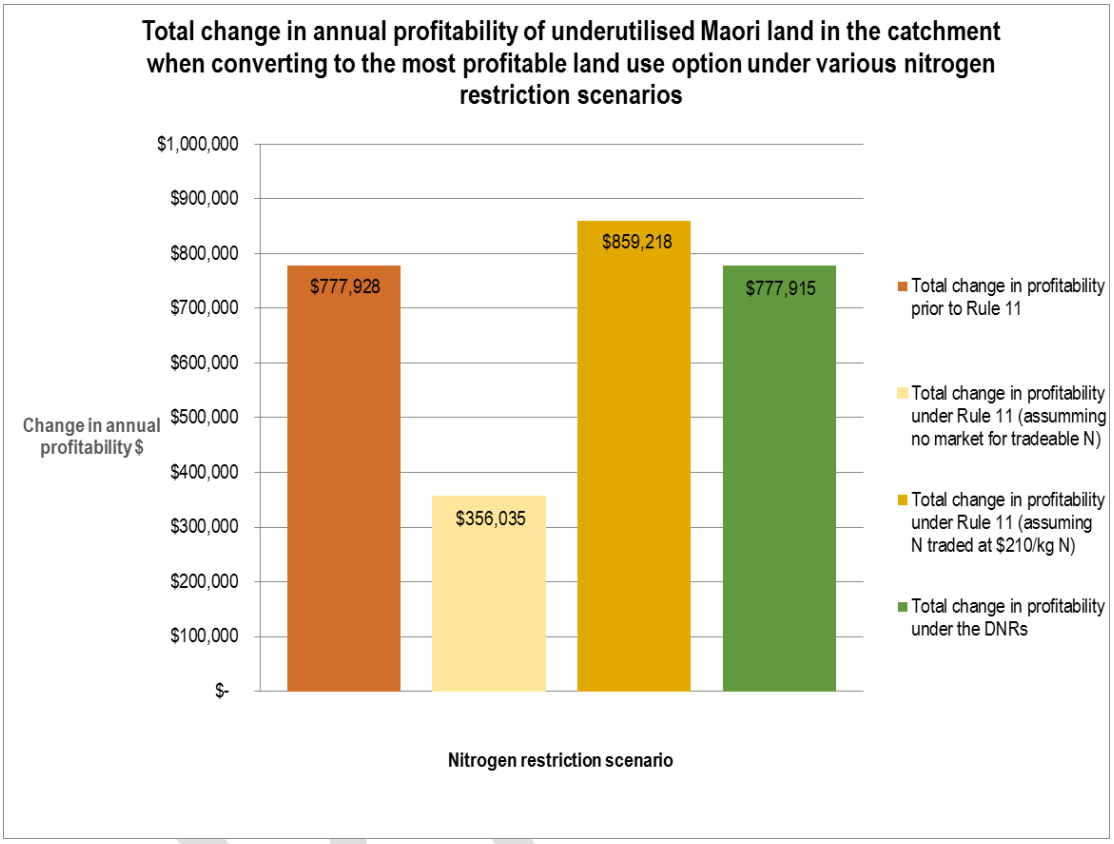

Figure 12. Total change in annual profitability for 5,017ha of potentially underutilised Māori land in the lake Rotorua catchment assuming various nitrogen restriction scenarios and a traded nitrogen price of **$284/kg N**.

8. DISCUSSION

Utilisation of Māori Land

8.1. The difficulty with quantifying underutilised land at a catchment scale is that the drivers behind the assessment utilisation can be very broad and often differ depending on who is assessing the utilisation and the local circumstances of the land parcel.

8.2. A financial vs cultural perspective when assessing land utilisation will often lead to contradicting conclusions given the difference in perspective. For example, a bush and scrub block on LUC 2 land may be viewed as fully utilised given the history and cultural significance of this area by the owners of that land. However, other owners who do not hold the same cultural views or ties to the land may view this land as financially underperforming given its quality. For this reason, it is infeasible to accurately quantify the exact area of underutilised land in the Lake Rotorua catchment without analysing each parcel of land individually. Thus the calculation of total underutilised land is limited to a quantitative rather than subjective level.

8.3. By filtering land assumed to be utilised, given the associated environmental covenants and geophysical characteristics of the land, the remaining potentially underutilised Māori Land equates to 5,017 hectares. As discussed in 4.9 and 4.11 above, this area would be further reduced if land with a formal governance structure or SNA areas were removed as utilised however this is a broad assumption which would need to be investigated at an individual parcel basis. For example, there may be Māori land with a formal governance structure within the catchment which would financially benefit from land use change however has not been able to implement this change due to capital or information constraints.

8.4. Size and contiguity of land parcels is another very important determinant when assessing utilisation of land, particularly with regards to Māori land within the catchment.

8.5. Independent parcels of land which are of insufficient size to be operated or leased as a standalone operation will often be limited to the land uses of neighbouring land. Where there is no net gain from converting land to the neighbouring land use or where the neighbours do not wish to lease the land, this may result in the land in question being deemed utilised irrespective of the current land use and quality of the land.

Alternatively, where more than one contiguous potentially underutilised Māori land parcels exist, there may be potential for collaboration between entities to gain scale which may be more attractive to potential operators/lessees.

8.6. Similarly, contiguity of LUC classes within a parcel of land may also result in land becoming land locked by unsuitable or undesirable land. For example: collectively large areas of LUC 2 land may exist within a parcel of land however individually these areas of LUC 2 land may be land locked by LUC 6 to 8 land which is best suited to forestry or native retirement. Therefore scale and accessibility again become an issue for the individual areas of LUC 2 land within the parcel. In reality these areas would likely be aligned with the surrounding land use and while being termed underutilised given the quality of the land are in reality utilised given these limitations.

Profitability of proposed land use conversion options

8.7. As seen in Table 9 above, cropping and dairy feature most often as the most profitable land use conversion option for underutilised Māori land on LUC 2 and LUC 3 land prior to any nitrogen restriction rules. This is largely due to the high rental return relative to the conversion cost given this model assumes no pastoral grazing and the lack of accountability for environmental externalities – in this case diffuse N loss.

8.8. The leased cut and carry model features most often as the most profitable land use conversion option on LUC 2 and LUC 3 land under Rule 11 and the Draft Nutrient Rules. It is important to appreciate that in reality while it is unlikely all 891 hectares of potentially underutilised LUC 2 and LUC 3 land would be converted to cut and carry a conversion on this scale would potentially flood the pasture supplement market with up to 40,000 silage and/or hay (12 bale equivalent) bales. With dairy and dairy support under increasing pressure from nitrogen rules and at present milk price, there is potential for cut and carry lessee revenues to fall with oversupply, particularly if cheaper, lower protein supplements are available.

8.9. Data supplied by Scion was used to project the lease values for forestry. Projected rentals were based on a 15% discount on the annuities of the discounted cash flow for each LUC class (Appendix 10.25). This was necessary given the range in slope class of the hypothetical models which significantly affects forestry costs particularly harvesting costs.

8.10. Manuka lease rental is projected to be less influenced by slope compared to forestry given bees are the primary harvesting and transport tool. While there are claims that honey production under orchard type Manuka models on flat land can be significantly increased, it is unclear how this type of model would influence market rental given insufficient data available.

8.11. Consequently, Comvita's projections of a long term lease rental for Manuka plantation for apiculture on hill country land of $100 per hectare per year was used over all land classes.

8.12. While the projected lease rentals from forestry exceed the projected lease returns for plantation Manuka on LUC 6 land or better, LUC 7 land is projected have a higher potential lease return under Manuka than forestry. However where access of individual blocks may restrict forestry, Manuka may be a more viable alternative.

8.13. However there are several limitations when considering leased Manuka land for apiculture which don't necessarily apply to lease forestry land;

8.13.1. Contiguous areas of at least 30 to 40 hectares depending on contour and shape of the land parcel are typically required for leased Manuka land for apiculture so to ensure quality of the honey. This is likely to eliminate and/or reduce potential lease returns for many smaller parcels of underutilised Māori within the catchment. Alternatively, while many forestry lessees would prefer larger areas, areas as low as 5 to 10 hectares may still be viable for a forestry lease depending on contour and access.

8.13.2. The New Zealand Manuka honey industry, and in particular the structure whereby land is leased for commercially planted Manuka for apiculture, is relatively young and of smaller scale when compared to the forestry industry in New Zealand. Depending on the amount of interest from land owners and the total area of land physically suitable for Manuka lease, there may be a limit to potential lessees for Manuka lease.

8.14. While there is potential for land owners who are considering converting from pastoral land into trees to increase returns through carbon trading via the ETS and/or AGS, the extent at which carbon trading would impact owners of leased underutilised Maori land is likely to be extremely variable given the range in governance structures, cultural values, perceived risk and size of individual blocks in question. Therefore further analysis of individual parcels would be required to assess the impacts of carbon trading on leased underutilised Maori land in the Lake Rotorua catchment.

Financial impact of the Draft Nutrient Rules

8.15. The impact of the Draft Nutrient Rules on underutilised Māori land in the Lake Rotorua catchment as it relates to land use change, can be assessed by comparing between converting to the most profitable land use alternative prior to the draft nutrient rules (starting point) and converting to the most profitable land use alternative under the draft nutrient rules.

8.16. However, this difference is going to be vastly dependant on whether the starting point is prior to, or post Rule 11 restrictions and whether the value of capital nitrogen is included under Rule 11.

8.17. If the starting point for comparison is assumed to be prior to Rule 11 then the capital value of nitrogen does not affect the starting point and consequently the effect of the capital value of nitrogen on land use change impacts exclusively on the change in profitability under the draft nutrient rules. However, if the starting point for comparison is post Rule 11 then the effect of the capital value of nitrogen is already partly encapsulated under Rule 11.

8.18. Some owners of underutilised Māori land in the Rotorua catchment may not be familiar with the Rule 11 restrictions already in place. For these owners, they would likely assess the impact of the Draft Nutrient Rules as the change in profitability from a starting point prior to Rule 11. This perspective would generally see the following trends between the most profitable land use conversion option prior to Rule 11 compared to the most profitable land use conversion option under the draft nutrient rules (Figure 13):

(i) An increase in profitability for pastoral land base models;

(ii) A decrease in profitability for land currently in forestry and bush and scrub;

(iii) An increase in profitability for existing gorse areas;

(iv) A decrease in profitability for grazed tree areas.

8.19. However for the majority of the catchment who are already operating under Rule 11, the impact of the Draft Nutrient Rules would likely be viewed as the change in profitability from a starting point post Rule 11. This perspective would generally see a decrease in the profitability between the most profitable land use conversion options for existing pastoral land, a nil impact on profitability between the most profitable land use conversion options for land currently in forestry and bush and scrub, and no real trend

for existing gorse or grazed tree areas which on average equate to a nil impact on profitability (Figure 13).

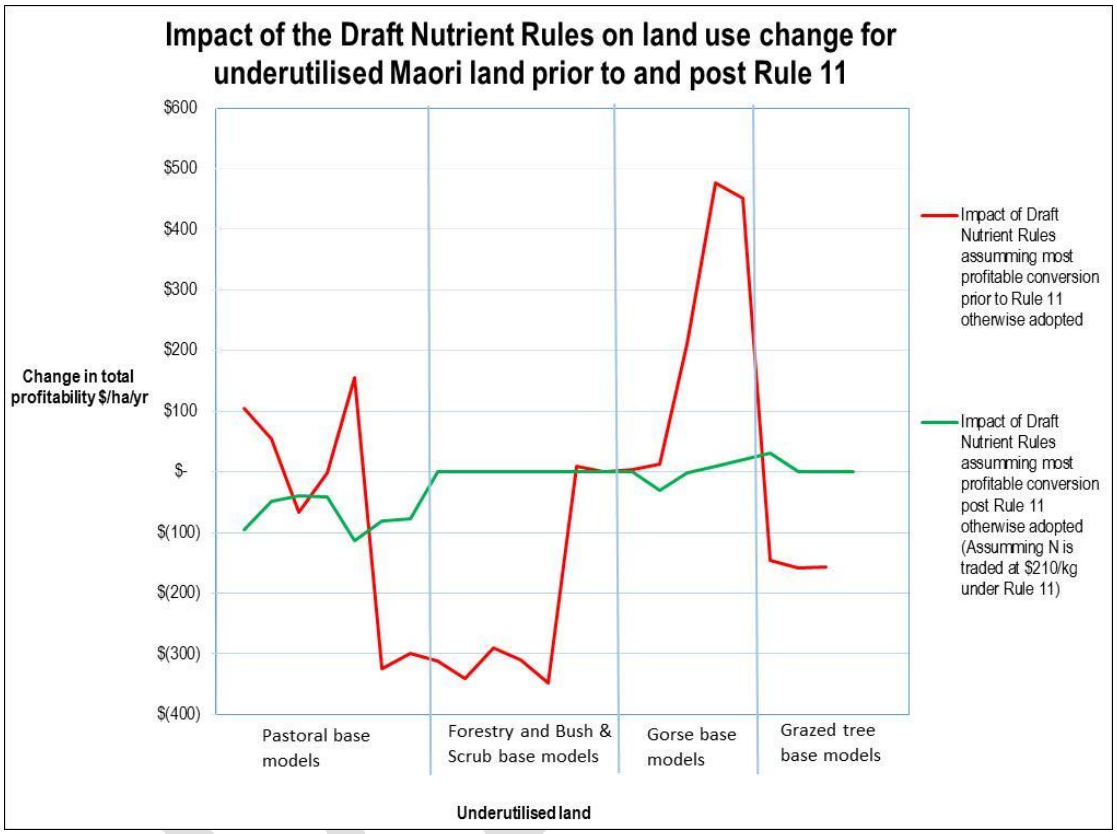

Figure 13. Impact of the Draft Nutrient Rules as it relates to land use change on underutilised Māori land in the Lake Rotorua catchment under two different starting points; prior to and post Rule 11.

8.20. While these trends are suggestive of the impact on underutilised Māori land assuming the most profitable land use conversion option is adopted in all instances, underutilised land parcels would need to be assessed on an individual parcel basis to accurately conclude the potential for land use conversion.

8.21. Size and contiguity of land parcels and also contiguity of LUC classes within land parcels are likely to represent the main physical limitations to potential land use change. Continuity with neighbouring land uses and access is another physical limitation which will limit the potential for land use change particularly when converting to pastoral lease scenarios.

8.22. However, finance, information and unity between owners is likely to represent the greatest hurdle for conversion of underutilised Māori land, particularly for smaller parcels without a formal governance structure.

9. CONCLUSIONS AND RECOMMENDATIONS

9.1. When assessing underutilised Māori land in the Lake Rotorua catchment at a high level geophysical basis, the total area of potentially underutilised land is projected to be in the vicinity of 5,017 hectares.

9.2. However if land was to be assessed on an individual parcel basis; limitations due to size, contiguity and layout of individual parcels is likely to result in a significant proportion of these areas being termed utilised, further reducing the total area of underutilised land in the catchment.

9.3. Additionally, perspective of utilisation is also likely to vary between parties depending on individual values such a financial versus cultural values.

9.3.1. To accurately determine the total area of underutilised land in the Lake Rotorua catchment further analysis at an individual parcel level would be required.

9.4. The financial implications of the draft nutrient rules as they relate to land use conversion of underutilised land differ depending on whether the assessed impact is relative to a starting point prior to or post Rule 11.

9.4.1. Assessing the impact of the draft nutrient rules on the change in profitability from land use conversion relative to the change in profitability which could have otherwise been achieved from land use conversion prior to Rule 11 is one view point.

(i) Under this perspective the draft nutrient rules would result in an average net decrease in annual profitability of ($36)/ha/yr.

(ii) This decrease in profitability is the result of the impact of capital nitrogen at $210/ha being required for land use change.

9.4.2. Assessing the impact of the draft nutrient rules on the change in profitability from land use conversion relative to the change in profitability which could have otherwise been achieved from land use conversion post Rule 11 is another viewpoint. This viewpoint also varies depending on whether the capital value of nitrogen is accounted for, i.e. whether there is assumed to be a market for traded nitrogen under Rule 11.

(i) Assuming the capital value of nitrogen is accounted for at $210/kg N under Rule 11, the draft nutrient rules are projected to result in an average net decrease in annual profitability of ($12)/ha/yr.

(ii) Assuming there is no market for traded nitrogen under Rule 11, the draft nutrient rules are projected to result in an average net increase in annual profitability of $48/ha/yr.

9.5. While the aggregated impact of the draft nutrient rules on underutilised Māori land in the Lake Rotorua catchment is projected to be negative, individual results are likely to vary due to the physical characteristics of individual blocks as mentions in 9.2 above. Consequently further block specific analysis is required to determine impacts on individual land owners.

10. APPENDICES

Hypothetical base models

10.1. Drystock LUC 2

Current land use Drystock LUC 2	Proposed land use									
	Leased pasture (Dairy)	Leased pasture (Drystock)	Leased pasture (Dairy support)	Leased Cut and Carry	Leased Cropping	Leased Forestry (Unowned cutting rights)	Native Bush and Scrub	Gorse	Tree crop (Manuka)	Leased Grazed Trees
Current leaching (hypothetical model)	50.5		32.2	5.7	41.6	2.5	3.0		3.0	
Rule 11 Benchmark		29.5								
pNDA		23.8								
Annual EBIT/Rental	$ 1,000	$ 650	$ 800	$ 700	$ 900	$ 245	$ -	$ -	$ 100	
Change in annual EBIT/ha	$ 350		$ 150	$ 50	$ 250	$ (405)	$ (650)		$ (550)	
Change in EBIT/ha capitalised (8%)	$ 4,375		$ 1,875	$ 625	$ 3,125	$ (5,065)	$ (8,125)		$ (6,875)	
Cost of conversion (per ha)										
Fencing	$ 216		$ -	$ -	$ -	$ -	$ -		$ -	
Water reticulation	$ 304		$ -	$ -	$ -	$ -	$ -		$ -	
Troughs and fittings	$ 210		$ -	$ -	$ -	$ -	$ -		$ -	
Races/Tracks	$ 788		$ -	$ -	$ -	$ -	$ -		$ -	
Re-grassing	$ 1,000		$ -	$ -	$ -	$ -	$ -		$ -	
Capital Fertiliser	$ 536		$ 327	$ 536	$ 536	$ -	$ -		$ -	
Planting	$ -		$ -	$ -	$ -	$ -	$ 2,500		$ -	
Clearing						$ -	$ -		$ -	
Afforestation grant						$ -	$ -		$ -	
Deforestation liability										
Administration/consultancy	$ 100		$ 100	$ 100	$ 100	$ 100	$ 100		$ 100	
Total conversion cost	$ 3,153		$ 427	$ 636	$ 636	$ 100	$ 2,600		$ 100	
Conversion cost ammortised (8%)	$ 252		$ 34	$ 51	$ 51	$ 8	$ 208		$ 8	
Net capital (cost)/benefit per ha	**$ 1,222**		**$ 1,448**	**$ (11)**	**$ 2,489**	**$ (5,165)**	**$ (10,725)**		**$ (6,975)**	
Net annual (cost)/benefit per ha ammortised (8%)	**$ 98**		**$ 116**	**$ (1)**	**$ 199**	**$ (413)**	**$ (858)**		**$ (558)**	
Capital (Cost)/gain of N under Rule 11	$ (4,416)		$ (580)	$ 4,996	$ (2,549)	$ 5,666	$ 5,561		$ 5,561	
Annual (Cost)/gain of N ammortised (8%)	$ (353)		$ (46)	$ 400	$ (204)	$ 453	$ 445		$ 445	
Net capital (cost)/benefit per ha under Rule 11	**$ (3,195)**		**$ 868**	**$ 4,985**	**$ (60)**	**$ 501**	**$ (5,164)**		**$ (1,414)**	
Net annual (cost)/benefit per ha ammortised (8%)	**$ (256)**		**$ 69**	**$ 399**	**$ (5)**	**$ 40**	**$ (413)**		**$ (113)**	
Capital (Cost)/gain of N under Draft Nutrient Rules (pNDA)	$ (5,603)		$ (1,766)	$ 3,809	$ (3,736)	$ 4,479	$ 4,374		$ 4,374	
Annual (Cost)/gain of N ammortised (8%)	$ (448)		$ (141)	$ 305	$ (299)	$ 358	$ 350		$ 350	
Net capital (cost)/benefit per ha under Draft Nutrient Rules	**$ (4,381)**		**$ (318)**	**$ 3,798**	**$ (1,247)**	**$ (686)**	**$ (6,351)**		**$ (2,601)**	
Net annual (cost)/benefit per ha ammortised (8%)	**$ (350)**		**$ (25)**	**$ 304**	**$ (100)**	**$ (55)**	**$ (508)**		**$ (208)**	

10.2. Drystock LUC 3

Current land use Drystock LUC 3	Proposed land use									
	Leased pasture (Dairy)	Leased pasture (Drystock)	Leased pasture (Dairy support)	Cut and Carry	Cropping	Forestry (Unowned cutting rights)	Native Bush and Scrub	Gorse	Tree crop (Manuka)	Grazed Trees
Current leaching (hypothetical model)	38.8		27.8	5.8	40.1	2.5	3.0		3.0	
Rule 11 Benchmark		23.9								
pNDA		21.0								
Annual EBIT/Rental	$ 900	$ 550	$ 700	$ 600	$ 800	$ 227	$ -	$ -	$ 100	
Change in annual EBIT/ha	$ 350		$ 150	$ 50	$ 250	$ (323)	$ (550)		$ (450)	
Change in EBIT/ha capitalised (8%)	$ 4,375		$ 1,875	$ 625	$ 3,125	$ (4,038)	$ (6,875)		$ (5,625)	
Cost of conversion (per ha)										
Fencing	$ 216		$ -	$ -	$ -	$ -	$ -		$ -	
Water reticulation	$ 304		$ -	$ -	$ -	$ -	$ -		$ -	
Troughs and fittings	$ 210		$ -	$ -	$ -	$ -	$ -		$ -	
Races/Tracks	$ 788		$ -	$ -	$ -	$ -	$ -		$ -	
Re-grassing	$ 1,000		$ -		$ -	$ -	$ -		$ -	
Capital Fertiliser	$ 536		$ 327	$ 536	$ 536	$ -	$ -		$ -	
Planting	$ -		$ -	$ -	$ -	$ -	$ 2,500		$ -	
Clearing						$ -	$ -		$ -	
Afforestation grant						$ -	$ -		$ -	
Deforestation liability										
Administration/consultancy	$ 100		$ 100	$ 100	$ 100	$ 100	$ 100		$ 100	
Total conversion cost	$ 3,153		$ 427	$ 636	$ 636	$ 100	$ 2,600		$ 100	
Conversion cost ammortised (8%)	$ 252		$ 34	$ 51	$ 51	$ 8	$ 208		$ 8	
Net capital (cost)/benefit per ha	**$ 1,222**		**$ 1,448**	**$ (11)**	**$ 2,489**	**$ (4,138)**	**$ (9,475)**		**$ (5,725)**	
Net annual (cost)/benefit per ha ammortised (8%)	**$ 98**		**$ 116**	**$ (1)**	**$ 199**	**$ (331)**	**$ (758)**		**$ (458)**	
Capital (Cost)/gain of N under Rule 11	$ (3,138)		$ (815)	$ 3,797	$ (3,406)	$ 4,492	$ 4,387		$ 4,387	
Annual (Cost)/gain of N ammortised (8%)	$ (251)		$ (65)	$ 304	$ (273)	$ 359	$ 351		$ 351	
Net capital (cost)/benefit per ha under Rule 11	**$ (1,916)**		**$ 633**	**$ 3,786**	**$ (917)**	**$ 353**	**$ (5,088)**		**$ (1,338)**	
Net annual (cost)/benefit per ha ammortised (8%)	**$ (153)**		**$ 51**	**$ 303**	**$ (73)**	**$ 28**	**$ (407)**		**$ (107)**	
Capital (Cost)/gain of N under Draft Nutrient Rules (pNDA)	$ (3,747)		$ (1,424)	$ 3,187	$ (4,016)	$ 3,882	$ 3,777		$ 3,777	
Annual (Cost)/gain of N ammortised (8%)	$ (300)		$ (114)	$ 255	$ (321)	$ 311	$ 302		$ 302	
Net capital (cost)/benefit per ha under Draft Nutrient Rules	**$ (2,525)**		**$ 24**	**$ 3,176**	**$ (1,527)**	**$ (256)**	**$ (5,698)**		**$ (1,948)**	
Net annual (cost)/benefit per ha ammortised (8%)	**$ (202)**		**$ 2**	**$ 254**	**$ (122)**	**$ (20)**	**$ (456)**		**$ (156)**	

10.3. Drystock LUC 4

	Proposed land use								
Current land use Drystock LUC 4	Leased pasture (Dairy)	Leased pasture (Drystock)	Leased pasture (Dairy support)	Cut and Carry	Cropping	Forestry (Unowned cutting rights)	Native Bush and Scrub	Gorse	Tree crop (Manuka)	Grazed Trees
Current leaching (hypothetical model)	38.1		26.7			2.5	3.0		3.0	
Rule 11 Benchmark		24.7								
pNDA		22.4								
Annual EBIT/Rental	$ 800	$ 450	$ 600			$ 173	$ -		$ 100	
Change in annual EBIT/ha	$ 350		$ 150			$ (277)	$ (450)		$ (350)	
Change in EBIT/ha capitalised (8%)	$ 4,375		$ 1,875			$ (3,458)	$ (5,625)		$ (4,375)	
Cost of conversion (per ha)										
Fencing	$ 216		$ -			$ -	$ -		$ -	
Water reticulation	$ 304		$ -			$ -	$ -		$ -	
Troughs and fittings	$ 210		$ -			$ -	$ -		$ -	
Races/Tracks	$ 788		$ -			$ -	$ -		$ -	
Re-grassing	$ 1,000		$ -			$ -	$ -		$ -	
Capital Fertiliser	$ 536		$ 327			$ -	$ -		$ -	
Planting	$ -		$ -			$ -	$ 2,500		$ -	
Clearing						$ -	$ -		$ -	
Afforestation grant						$ -	$ -		$ -	
Deforestation liability										
Administration/consultancy	$ 100		$ 100			$ 100	$ 100		$ 100	
Total conversion cost	$ 3,153		$ 427			$ 100	$ 2,600		$ 100	
Conversion cost ammortised (8%)	$ 252		$ 34			$ 8	$ 208		$ 8	
Net capital (cost)/benefit per ha	**$ 1,222**		**$ 1,448**			**$ (3,558)**	**$ (8,225)**		**$ (4,475)**	
Net annual (cost)/benefit per ha ammortised (8%)	**$ 98**		**$ 116**			**$ (285)**	**$ (658)**		**$ (358)**	
Capital (Cost)/gain of N under Rule 11	$ (2,801)		$ (424)			$ 4,665	$ 4,560		$ 4,560	
Annual (Cost)/gain of N ammortised (8%)	$ (224)		$ (34)			$ 373	$ 365		$ 365	
Net capital (cost)/benefit per ha under Rule 11	**$ (1,579)**		**$ 1,024**			**$ 1,107**	**$ (3,665)**		**$ 85**	
Net annual (cost)/benefit per ha ammortised (8%)	**$ (126)**		**$ 82**			**$ 89**	**$ (293)**		**$ 7**	
Capital (Cost)/gain of N under Draft Nutrient Rules (pNDA)	$ (3,293)		$ (916)			$ 4,173	$ 4,068		$ 4,068	
Annual (Cost)/gain of N ammortised (8%)	$ (263)		$ (73)			$ 334	$ 325		$ 325	
Net capital (cost)/benefit per ha under Draft Nutrient Rules	**$ (2,071)**		**$ 532**			**$ 615**	**$ (4,157)**		**$ (407)**	
Net annual (cost)/benefit per ha ammortised (8%)	**$ (166)**		**$ 43**			**$ 49**	**$ (333)**		**$ (33)**	

10.4. Dairy support LUC 2

Current land use Dairy Support LUC 2	Proposed land use									
	Leased pasture (Dairy)	Leased pasture (Drystock)	Leased pasture (Dairy support)	Leased Cut and Carry	Leased Cropping	Leased Forestry (Unowned cutting rights)	Native Bush and Scrub	Gorse	Tree crop (Leased Manuka)	Leased Grazed Trees
Current leaching (hypothetical model)	45.3	19.4		5.3	38.6	2.5	3.0		3.0	
Rule 11 Benchmark			19.6							
pNDA			17.1							
Annual EBIT/Rental	$ 1,000	$ 650	$ 800	$ 700	$ 900	$ 245	$ -		$ 100	
Change in annual EBIT/ha	$ 200	$ (150)		$ (100)	$ 100	$ (555)	$ (800)		$ (700)	
Change in EBIT/ha capitalised (8%)	$ 2,500	$ (1,875)		$ (1,250)	$ 1,250	$ (6,940)	$ (10,000)		$ (8,750)	
Cost of conversion (per ha)										
Fencing	$ 216	$ 1,294		$ -	$ -	$ -	$ -		$ -	
Water reticulation	$ 304	$ -		$ -	$ -	$ -	$ -		$ -	
Troughs and fittings	$ 210	$ -		$ -	$ -	$ -	$ -		$ -	
Races/Tracks	$ 788	$ -		$ -	$ -	$ -	$ -		$ -	
Re-grassing	$ 1,000	$ -		$ -	$ -	$ -	$ -		$ -	
Capital Fertiliser/Lime	$ 274	$ -		$ 274	$ 274	$ -	$ -		$ -	
Planting	$ -	$ -		$ -	$ -	$ -	$ 2,500		$ -	
Clearing							$ -		$ -	
Afforestation grant						$ -	$ -		$ -	
Deforestation liability										
Administration/consultancy	$ 100	$ 100		$ 100	$ 100	$ 100	$ 100		$ 100	
Total conversion cost	$ 2,891	$ 1,394		$ 374	$ 374	$ 100	$ 2,600		$ 100	
Conversion cost ammortised (8%)	$ 231	$ 112		$ 30	$ 30	$ 8	$ 208		$ 8	
Net capital (cost)/benefit per ha	**$ (391)**	**$ (3,269)**		**$ (1,624)**	**$ 876**	**$ (7,040)**	**$ (12,600)**		**$ (8,850)**	
Net annual (cost)/benefit per ha ammortised (8%)	**$ (31)**	**$ (262)**		**$ (130)**	**$ 70**	**$ (563)**	**$ (1,008)**		**$ (708)**	
Capital (Cost)/gain of N under Rule 11	$ (5,396)	$ 37		$ 2,996	$ (3,978)	$ 3,592	$ 3,487		$ 3,487	
Annual (Cost)/gain of N ammortised (8%)	$ (432)	$ 3		$ 240	$ (318)	$ 287	$ 279		$ 279	
Net capital (cost)/benefit per ha under Rule 11	**$ (5,787)**	**$ (3,232)**		**$ 1,372**	**$ (3,102)**	**$ (3,448)**	**$ (9,113)**		**$ (5,363)**	
Net annual (cost)/benefit per ha ammortised (8%)	**$ (463)**	**$ (259)**		**$ 110**	**$ (248)**	**$ (276)**	**$ (729)**		**$ (429)**	
Capital (Cost)/gain of N under Draft Nutrient Rules (pNDA)	$ (5,921)	$ (488)		$ 2,471	$ (4,503)	$ 3,067	$ 2,962		$ 2,962	
Annual (Cost)/gain of N ammortised (8%)	$ (474)	$ (39)		$ 198	$ (360)	$ 245	$ 237		$ 237	
Net capital (cost)/benefit per ha under Draft Nutrient Rules	**$ (6,312)**	**$ (3,757)**		**$ 847**	**$ (3,627)**	**$ (3,973)**	**$ (9,638)**		**$ (5,888)**	
Net annual (cost)/benefit per ha ammortised (8%)	**$ (505)**	**$ (301)**		**$ 68**	**$ (290)**	**$ (318)**	**$ (771)**		**$ (471)**	

10.5. Dairy support LUC 3

Current land use Dairy Support LUC 3	Proposed land use									
	Leased pasture (Dairy)	Leased pasture (Drystock)	Leased pasture (Dairy support)	Cut and Carry	Cropping	Forestry (Unowned cutting rights)	Native Bush and Scrub	Gorse	Tree crop (Manuka)	Grazed Trees
Current leaching (hypothetical model)	66.5	20.5		7.3	59.2	2.5	3.0		3.0	
Rule 11 Benchmark			35.1							
pNDA			28.4							
Annual EBIT/Rental	$ 900	$ 550	$ 700	$ 600	$ 800	$ 227	$ -		$ 100	
Change in annual EBIT/ha	$ 200	$ (150)		$ (100)	$ 100	$ (473)	$ (700)		$ (600)	
Change in EBIT/ha capitalised (8%)	$ 2,500	$ (1,875)		$ (1,250)	$ 1,250	$ (5,913)	$ (8,750)		$ (7,500)	
Cost of conversion (per ha)										
Fencing	$ 216	$ 1,294		$ -	$ -	$ -	$ -		$ -	
Water reticulation	$ 304	$ -		$ -	$ -	$ -	$ -		$ -	
Troughs and fittings	$ 210	$ -		$ -	$ -	$ -	$ -		$ -	
Races/Tracks	$ 788	$ -		$ -	$ -	$ -	$ -		$ -	
Re-grassing	$ 1,000	$ -		$ -	$ -	$ -	$ -		$ -	
Capital Fertiliser/Lime	$ 274	$ -		$ 274	$ 274	$ -	$ -		$ -	
Planting	$ -	$ -		$ -	$ -	$ -	$ 2,500		$ -	
Clearing				$ -	$ -	$ -	$ -		$ -	
Afforestation grant						$ -	$ -		$ -	
Deforestation liability										
Administration/consultancy	$ 100	$ 100		$ 100	$ 100	$ 100	$ 100		$ 100	
Total conversion cost	$ 2,891	$ 1,394		$ 374	$ 374	$ 100	$ 2,600		$ 100	
Conversion cost ammortised (8%)	$ 231	$ 112		$ 30	$ 30	$ 8	$ 208		$ 8	
Net capital (cost)/benefit per ha	**$ (391)**	**$ (3,269)**		**$ (1,624)**	**$ 876**	**$ (6,013)**	**$ (11,350)**		**$ (7,600)**	
Net annual (cost)/benefit per ha ammortised (8%)	**$ (31)**	**$ (262)**		**$ (130)**	**$ 70**	**$ (481)**	**$ (908)**		**$ (608)**	
Capital (Cost)/gain of N under Rule 11	$ (6,595)	$ 3,065		$ 5,841	$ (5,060)	$ 6,841	$ 6,736		$ 6,736	
Annual (Cost)/gain of N ammortised (8%)	$ (528)	$ 245		$ 467	$ (405)	$ 547	$ 539		$ 539	
Net capital (cost)/benefit per ha under Rule 11	**$ (6,986)**	**$ (204)**		**$ 4,217**	**$ (4,184)**	**$ 828**	**$ (4,614)**		**$ (864)**	
Net annual (cost)/benefit per ha ammortised (8%)	**$ (559)**	**$ (16)**		**$ 337**	**$ (335)**	**$ 66**	**$ (369)**		**$ (69)**	
Capital (Cost)/gain of N under Draft Nutrient Rules (pNDA)	$ (8,005)	$ 1,655		$ 4,432	$ (6,469)	$ 5,431	$ 5,326		$ 5,326	
Annual (Cost)/gain of N ammortised (8%)	$ (640)	$ 132		$ 355	$ (518)	$ 434	$ 426		$ 426	
Net capital (cost)/benefit per ha under Draft Nutrient Rules	**$ (8,396)**	**$ (1,613)**		**$ 2,808**	**$ (5,593)**	**$ (582)**	**$ (6,024)**		**$ (2,274)**	
Net annual (cost)/benefit per ha ammortised (8%)	**$ (672)**	**$ (129)**		**$ 225**	**$ (447)**	**$ (47)**	**$ (482)**		**$ (182)**	

10.6. Cut and carry LUC 2

	Proposed land use								
Current land use Cut & Carry LUC 2	Leased pasture (Dairy)	Leased pasture (Drystock)	Leased pasture (Dairy support)	Cut and Carry	Cropping	Forestry (Unowned cutting rights)	Native Bush and Scrub	Gorse	Tree crop (Manuka)	Grazed Trees
Current leaching (hypothetical model)	48.6	20.9	31.5		40.5	2.5	3.0		3.0	
Rule 11 Benchmark				24.1						
pNDA				19.3						
Annual EBIT/Rental	$ 1,000	$ 650	$ 800	$ 700	$ 900	$ 245	$ -		$ 100	
Change in annual EBIT/ha	$ 300	$ (50)	$ 100		$ 200	$ (455)	$ (700)		$ (600)	
Change in EBIT/ha capitalised (8%)	$ 3,750	$ (625)	$ 1,250		$ 2,500	$ (5,690)	$ (8,750)		$ (7,500)	
Cost of conversion (per ha)										
Fencing	$ 324	$ 518	$ -		$ -	$ -	$ -		$ -	
Water reticulation	$ 304	$ 124	$ 124		$ -	$ -	$ -		$ -	
Troughs and fittings	$ 210	$ 130	$ 130		$ -	$ -	$ -		$ -	
Races/Tracks	$ 788	$ -	$ -		$ -	$ -	$ -		$ -	
Re-grassing	$ 1,000	$ -	$ -		$ -	$ -	$ -		$ -	
Capital Fertiliser	$ -	$ -	$ -		$ -	$ -	$ -		$ -	
Planting	$ -	$ -	$ -		$ -	$ -	$ 2,500		$ -	
Clearing						$ -	$ -		$ -	
Afforestation grant						$ -	$ -		$ -	
Deforestation liability										
Administration/consultancy	$ 100	$ 100	$ 100		$ 100	$ 100	$ 100		$ 100	
Total conversion cost	$ 2,725	$ 871	$ 354		$ 100	$ 100	$ 2,600		$ 100	
Conversion cost ammortised (8%)	$ 218	$ 70	$ 28		$ 8	$ 8	$ 208		$ 8	
Net capital (cost)/benefit per ha	**$ 1,025**	**$ (1,496)**	**$ 896**		**$ 2,400**	**$ (5,790)**	**$ (11,350)**		**$ (7,600)**	
Net annual (cost)/benefit per ha ammortised (8%)	**$ 82**	**$ (120)**	**$ 72**		**$ 192**	**$ (463)**	**$ (908)**		**$ (608)**	
Capital (Cost)/gain of N under Rule 11	$ (5,144)	$ 687	$ (1,539)		$ (3,435)	$ 4,541	$ 4,436		$ 4,436	
Annual (Cost)/gain of N ammortised (8%)	$ (412)	$ 55	$ (123)		$ (275)	$ 363	$ 355		$ 355	
Net capital (cost)/benefit per ha under Rule 11	**$ (4,120)**	**$ (809)**	**$ (642)**		**$ (1,035)**	**$ (1,249)**	**$ (6,914)**		**$ (3,164)**	
Net annual (cost)/benefit per ha ammortised (8%)	**$ (330)**	**$ (65)**	**$ (51)**		**$ (83)**	**$ (100)**	**$ (553)**		**$ (253)**	
Capital (Cost)/gain of N under Draft Nutrient Rules (pNDA)	$ (6,157)	$ (326)	$ (2,552)		$ (4,448)	$ 3,528	$ 3,423		$ 3,423	
Annual (Cost)/gain of N ammortised (8%)	$ (493)	$ (26)	$ (204)		$ (356)	$ 282	$ 274		$ 274	
Net capital (cost)/benefit per ha under Draft Nutrient Rules	**$ (5,133)**	**$ (1,822)**	**$ (1,656)**		**$ (2,048)**	**$ (2,262)**	**$ (7,927)**		**$ (4,177)**	
Net annual (cost)/benefit per ha ammortised (8%)	**$ (411)**	**$ (146)**	**$ (132)**		**$ (164)**	**$ (181)**	**$ (634)**		**$ (334)**	

10.7. Cut and carry LUC 3

	Proposed land use									
Current land use Cut & Carry LUC 3	Leased pasture (Dairy)	Leased pasture (Drystock)	Leased pasture (Dairy support)	Cut and Carry	Cropping	Forestry (Unowned cutting rights)	Native Bush and Scrub	Gorse	Tree crop (Manuka)	Grazed Trees
Current leaching (hypothetical model)	47.2	19.9	29.3		38.9	2.5	3.0		3.0	
Rule 11 Benchmark				23.3						
pNDA				18.6						
Annual EBIT/Rental	$ 900	$ 550	$ 700	$ 600	$ 800	$ 227	$ -		$ 100	
Change in annual EBIT/ha	$ 300	$ (50)	$ 100		$ 200	$ (373)	$ (600)		$ (500)	
Change in EBIT/ha capitalised (8%)	$ 3,750	$ (625)	$ 1,250		$ 2,500	$ (4,663)	$ (7,500)		$ (6,250)	
Cost of conversion (per ha)										
Fencing	$ 324	$ 518	$ -		$ -	$ -	$ -		$ -	
Water reticulation	$ 304	$ 124	$ 124		$ -	$ -	$ -		$ -	
Troughs and fittings	$ 210	$ 130	$ 130		$ -	$ -	$ -		$ -	
Races/Tracks	$ 788	$ -	$ -		$ -	$ -	$ -		$ -	
Re-grassing	$ 1,000	$ -	$ -		$ -	$ -	$ -		$ -	
Capital Fertiliser					$ -	$ -	$ -		$ -	
Planting	$ -	$ -	$ -		$ -	$ -	$ 2,500		$ -	
Clearing						$ -	$ -		$ -	
Afforestation grant						$ -	$ -		$ -	
Deforestation liability										
Administration/consultancy	$ 100	$ 100	$ 100		$ 100	$ 100	$ 100		$ 100	
Total conversion cost	$ 2,725	$ 871	$ 354		$ 100	$ 100	$ 2,600		$ 100	
Conversion cost ammortised (8%)	$ 218	$ 70	$ 28		$ 8	$ 8	$ 208		$ 8	
Net capital (cost)/benefit per ha	**$ 1,025**	**$ (1,496)**	**$ 896**		**$ 2,400**	**$ (4,763)**	**$ (10,100)**		**$ (6,350)**	
Net annual (cost)/benefit per ha ammortised (8%)	**$ 82**	**$ (120)**	**$ 72**		**$ 192**	**$ (381)**	**$ (808)**		**$ (508)**	
Capital (Cost)/gain of N under Rule 11	$ (5,026)	$ 711	$ (1,259)		$ (3,283)	$ 4,358	$ 4,253		$ 4,253	
Annual (Cost)/gain of N ammortised (8%)	$ (402)	$ 57	$ (101)		$ (263)	$ 349	$ 340		$ 340	
Net capital (cost)/benefit per ha under Rule 11	**$ (4,002)**	**$ (786)**	**$ (363)**		**$ (883)**	**$ (405)**	**$ (5,847)**		**$ (2,097)**	
Net annual (cost)/benefit per ha ammortised (8%)	**$ (320)**	**$ (63)**	**$ (29)**		**$ (71)**	**$ (32)**	**$ (468)**		**$ (168)**	
Capital (Cost)/gain of N under Draft Nutrient Rules (pNDA)	$ (6,003)	$ (266)	$ (2,236)		$ (4,260)	$ 3,382	$ 3,277		$ 3,277	
Annual (Cost)/gain of N ammortised (8%)	$ (480)	$ (21)	$ (179)		$ (341)	$ 271	$ 262		$ 262	
Net capital (cost)/benefit per ha under Draft Nutrient Rules	**$ (4,978)**	**$ (1,762)**	**$ (1,340)**		**$ (1,860)**	**$ (1,381)**	**$ (6,823)**		**$ (3,073)**	
Net annual (cost)/benefit per ha ammortised (8%)	**$ (398)**	**$ (141)**	**$ (107)**		**$ (149)**	**$ (111)**	**$ (546)**		**$ (246)**	

10.8. Forestry LUC 2

Current land use Forestry LUC 2	Proposed land use									
	Leased pasture (Dairy)	Leased pasture (Drystock)	Leased pasture (Dairy support)	Cut and Carry	Cropping	Forestry	Native Bush and Scrub	Gorse	Tree crop (Manuka)	Grazed Trees
Current leaching (hypothetical model)	39.8	17.7	25.9	5.0	32.4		3.0		3.0	
Rule 11 Benchmark						3.1				
pNDA						3.1				
Annual EBIT/Rental	$ 1,000	$ 650	$ 800	$ 700	$ 900	$ 245	$ -		$ 100	
Change in annual EBIT/ha	$ 755	$ 405	$ 555	$ 455	$ 655		$ (245)		$ (145)	
Change in EBIT/ha capitalised (8%)	$ 9,440	$ 5,065	$ 6,940	$ 5,690	$ 8,190		$ (3,060)		$ (1,810)	
Cost of conversion (per ha)										
Fencing	$ 756	$ 1,553	$ 648	$ -	$ -		$ -		$ -	
Water reticulation	$ 304	$ 124	$ 124	$ -	$ -		$ -		$ -	
Troughs and fittings	$ 210	$ 130	$ 130	$ -	$ -		$ -		$ -	
Races/Tracks	$ 788	$ -	$ -	$ -	$ -		$ -		$ -	
Re-grassing	$ 1,000	$ 1,000	$ 1,000	$ 1,000	$ -		$ -		$ -	
Capital Fertiliser/Lime	$ 626	$ 370	$ 370	$ 626	$ 626		$ -		$ -	
Planting	$ -	$ -	$ -	$ -	$ -		$ 2,500		$ -	
Clearing and ground preperation	$ 2,200	$ 2,200	$ 2,200	$ 2,200	$ 2,200		$ 655		$ 655	
Afforestation grant						$ -			$ -	
Deforestation liability										
Administration/consultancy	$ 100	$ 100	$ 100	$ 100	$ 100		$ 100		$ 100	
Total conversion cost	$ 5,983	$ 5,476	$ 4,572	$ 3,926	$ 2,926		$ 3,255		$ 755	
Conversion cost ammortised (8%)	$ 479	$ 438	$ 366	$ 314	$ 234		$ 260		$ 60	
Net capital (cost)/benefit per ha	**$ 3,457**	**$ (411)**	**$ 2,368**	**$ 1,764**	**$ 5,264**		**$ (6,315)**		**$ (2,565)**	
Net annual (cost)/benefit per ha ammortised (8%)	**$ 277**	**$ (33)**	**$ 189**	**$ 141**	**$ 421**		**$ (505)**		**$ (205)**	
Capital (Cost)/gain of N under Rule 11	$ (7,718)	$ (3,064)	$ (4,801)	$ (403)	$ (6,153)		$ 17		$ 17	
Annual (Cost)/gain of N ammortised (8%)	$ (617)	$ (245)	$ (384)	$ (32)	$ (492)		$ 1		$ 1	
Net capital (cost)/benefit per ha under Rule 11	**$ (4,261)**	**$ (3,475)**	**$ (2,432)**	**$ 1,361**	**$ (889)**		**$ (6,298)**		**$ (2,548)**	
Net annual (cost)/benefit per ha ammortised (8%)	**$ (341)**	**$ (278)**	**$ (195)**	**$ 109**	**$ (71)**		**$ (504)**		**$ (204)**	
Capital (Cost)/gain of N under Draft Nutrient Rules (pNDA)	$ (7,718)	$ (3,064)	$ (4,801)	$ (403)	$ (6,153)		$ 17		$ 17	
Annual (Cost)/gain of N ammortised (8%)	$ (617)	$ (245)	$ (384)	$ (32)	$ (492)		$ 1		$ 1	
Net capital (cost)/benefit per ha under Draft Nutrient Rules	**$ (4,261)**	**$ (3,475)**	**$ (2,432)**	**$ 1,361**	**$ (889)**		**$ (6,298)**		**$ (2,548)**	
Net annual (cost)/benefit per ha ammortised (8%)	**$ (341)**	**$ (278)**	**$ (195)**	**$ 109**	**$ (71)**		**$ (504)**		**$ (204)**	

10.9. Forestry LUC 3

Current land use Forestry LUC 3	Proposed land use								
	Leased pasture (Dairy)	Leased pasture (Drystock)	Leased pasture (Dairy support)	Cut and Carry	Cropping	Forestry	Native Bush and Scrub	Gorse	Tree crop (Manuka)	Grazed Trees
Current leaching (hypothetical model)	51.5	21.2	30.4	6.2	45.3		3.0		3.0	
Rule 11 Benchmark						2.5				
pNDA						2.5				
Annual EBIT/Rental	$ 900	$ 550	$ 700	$ 600	$ 800	$ 227	$ -		$ 100	
Change in annual EBIT/ha	$ 673	$ 323	$ 473	$ 373	$ 573		$ (227)		$ (127)	
Change in EBIT/ha capitalised (8%)	$ 8,413	$ 4,038	$ 5,913	$ 4,663	$ 7,163		$ (2,837)		$ (1,587)	
Cost of conversion (per ha)										
Fencing	$ 756	$ 1,553	$ 648	$ -	$ -		$ -		$ -	
Water reticulation	$ 304	$ 124	$ 124	$ -	$ -		$ -		$ -	
Troughs and fittings	$ 210	$ 130	$ 130	$ -	$ -		$ -		$ -	
Races/Tracks	$ 788	$ -	$ -	$ -	$ -		$ -		$ -	
Re-grassing	$ 1,000	$ 1,000	$ 1,000	$ 1,000	$ -		$ -		$ -	
Capital Fertiliser/Lime	$ 626	$ 370	$ 370	$ 626	$ 626		$ -		$ -	
Planting	$ -	$ -	$ -	$ -	$ -		$ 2,500		$ -	
Clearing and ground preperation	$ 2,200	$ 2,200	$ 2,200	$ 2,200	$ 2,200		$ 655		$ 655	
Afforestation grant						$ -			$ -	
Deforestation liability										
Administration/consultancy	$ 100	$ 100	$ 100	$ 100	$ 100		$ 100		$ 100	
Total conversion cost	$ 5,983	$ 5,476	$ 4,572	$ 3,926	$ 2,926		$ 3,255		$ 755	
Conversion cost ammortised (8%)	$ 479	$ 438	$ 366	$ 314	$ 234		$ 260		$ 60	
Net capital (cost)/benefit per ha	**$ 2,430**	**$ (1,438)**	**$ 1,341**	**$ 737**	**$ 4,237**		**$ (6,092)**		**$ (2,342)**	
Net annual (cost)/benefit per ha ammortised (8%)	**$ 194**	**$ (115)**	**$ 107**	**$ 59**	**$ 339**		**$ (487)**		**$ (187)**	
Capital (Cost)/gain of N under Rule 11	$ (10,283)	$ (3,918)	$ (5,857)	$ (768)	$ (8,992)		$ (103)		$ (103)	
Annual (Cost)/gain of N ammortised (8%)	$ (823)	$ (313)	$ (469)	$ (61)	$ (719)		$ (8)		$ (8)	
Net capital (cost)/benefit per ha under Rule 11	**$ (7,853)**	**$ (5,356)**	**$ (4,515)**	**$ (31)**	**$ (4,755)**		**$ (6,194)**		**$ (2,444)**	
Net annual (cost)/benefit per ha ammortised (8%)	**$ (628)**	**$ (429)**	**$ (361)**	**$ (2)**	**$ (380)**		**$ (496)**		**$ (196)**	
Capital (Cost)/gain of N under Draft Nutrient Rules (pNDA)	$ (10,283)	$ (3,918)	$ (5,857)	$ (768)	$ (8,992)		$ (103)		$ (103)	
Annual (Cost)/gain of N ammortised (8%)	$ (823)	$ (313)	$ (469)	$ (61)	$ (719)		$ (8)		$ (8)	
Net capital (cost)/benefit per ha under Draft Nutrient Rules	**$ (7,853)**	**$ (5,356)**	**$ (4,515)**	**$ (31)**	**$ (4,755)**		**$ (6,194)**		**$ (2,444)**	
Net annual (cost)/benefit per ha ammortised (8%)	**$ (628)**	**$ (429)**	**$ (361)**	**$ (2)**	**$ (380)**		**$ (496)**		**$ (196)**	

10.10. Forestry LUC 4

Current land use Forestry LUC 4	Proposed land use									
	Leased pasture (Dairy)	Leased pasture (Drystock)	Leased pasture (Dairy support)	Cut and Carry	Cropping	Forestry	Native Bush and Scrub	Gorse	Tree crop (Manuka)	Grazed Trees
Current leaching (hypothetical model)	61.8	22.6	36.0				3.0		3.0	
Rule 11 Benchmark						2.5				
pNDA						2.5				
Annual EBIT/Rental	$ 800	$ 450	$ 600			$ 173	$ -		$ 100	
Change in annual EBIT/ha	$ 627	$ 277	$ 427				$ (173)		$ (73)	
Change in EBIT/ha capitalised (8%)	$ 7,833	$ 3,458	$ 5,333				$ (2,168)		$ (918)	
Cost of conversion (per ha)										
Fencing	$ 756	$ 1,553	$ 648				$ -		$ -	
Water reticulation	$ 304	$ 124	$ 124				$ -		$ -	
Troughs and fittings	$ 210	$ 130	$ 130				$ -		$ -	
Races/Tracks	$ 788	$ -	$ -				$ -		$ -	
Re-grassing	$ 1,000	$ 1,000	$ 1,000				$ -		$ -	
Capital Fertiliser/Lime	$ 626	$ 370	$ 370				$ -		$ -	
Planting	$ -	$ -	$ -				$ 2,500		$ -	
Clearing and ground preperation	$ 2,200	$ 2,200	$ 2,200				$ 655		$ 655	
Afforestation grant						$ -			$ -	
Deforestation liability										
Administration/consultancy	$ 100	$ 100	$ 100				$ 100		$ 100	
Total conversion cost	$ 5,983	$ 5,476	$ 4,572				$ 3,255		$ 755	
Conversion cost ammortised (8%)	$ 479	$ 438	$ 366				$ 260		$ 60	
Net capital (cost)/benefit per ha	**$ 1,849**	**$ (2,019)**	**$ 761**				**$ (5,423)**		**$ (1,673)**	
Net annual (cost)/benefit per ha ammortised (8%)	**$ 148**	**$ (162)**	**$ 61**				**$ (434)**		**$ (134)**	
Capital (Cost)/gain of N under Rule 11	$ (12,455)	$ (4,210)	$ (7,035)				$ (102)		$ (102)	
Annual (Cost)/gain of N ammortised (8%)	$ (996)	$ (337)	$ (563)				$ (8)		$ (8)	
Net capital (cost)/benefit per ha under Rule 11	**$ (10,605)**	**$ (6,229)**	**$ (6,274)**				**$ (5,525)**		**$ (1,775)**	
Net annual (cost)/benefit per ha ammortised (8%)	**$ (848)**	**$ (498)**	**$ (502)**				**$ (442)**		**$ (142)**	
Capital (Cost)/gain of N under Draft Nutrient Rules (pNDA)	$ (12,456)	$ (4,211)	$ (7,036)				$ (103)		$ (103)	
Annual (Cost)/gain of N ammortised (8%)	$ (996)	$ (337)	$ (563)				$ (8)		$ (8)	
Net capital (cost)/benefit per ha under Draft Nutrient Rules	**$ (10,606)**	**$ (6,230)**	**$ (6,275)**				**$ (5,526)**		**$ (1,776)**	
Net annual (cost)/benefit per ha ammortised (8%)	**$ (849)**	**$ (498)**	**$ (502)**				**$ (442)**		**$ (142)**	

10.11. Bush & scrub LUC 2

Current land use Bush & Scrub LUC 2	Proposed land use									
	Leased pasture (Dairy)	Leased pasture (Drystock)	Leased pasture (Dairy support)	Cut and Carry	Cropping	Forestry (Unowned cutting rights)	Native Bush and Scrub	Gorse	Tree crop (Manuka)	Grazed Trees
Current leaching (hypothetical model)	39.9	17.7	25.3	4.8	31.5	2.5			3.0	
Rule 11 Benchmark							3.0			
pNDA							3.0			
Annual EBIT/Rental	$ 1,000	$ 650	$ 800	$ 700	$ 900	$ 245	$ -		$ 100	
Change in annual EBIT/ha	$ 1,000	$ 650	$ 800	$ 700	$ 900	$ 245	$ -		$ 100	
Change in EBIT/ha capitalised (8%)	$ 12,500	$ 8,125	$ 10,000	$ 8,750	$ 11,250	$ 3,060	$ -		$ 1,250	
Cost of conversion (per ha)										
Fencing	$ 756	$ 1,553	$ 648	$ -	$ -	$ -			$ -	
Water reticulation	$ 304	$ 124	$ 124	$ -	$ -	$ -			$ -	
Troughs and fittings	$ 210	$ 130	$ 130	$ -	$ -	$ -			$ -	
Races/Tracks	$ 788	$ -	$ -	$ -	$ -	$ -			$ -	
Re-grassing	$ 1,000	$ 1,000	$ 1,000	$ 1,000	$ -	$ -			$ -	
Capital Fertiliser/Lime	$ 626	$ 370	$ 370	$ 626	$ 626	$ -			$ -	
Planting	$ -	$ -	$ -	$ -	$ -	$ -			$ -	
Clearing and ground preperation	$ 2,200	$ 2,200	$ 2,200	$ 2,200	$ 2,200	$ 655			$ 655	
Afforestation grant						$ -			$ -	
Deforestation liability	$ -	$ -	$ -	$ -	$ -					
Administration/consultancy	$ 100	$ 100	$ 100	$ 100	$ 100	$ 100			$ 100	
Total conversion cost	$ 5,983	$ 5,476	$ 4,572	$ 3,926	$ 2,926	$ 755			$ 755	
Conversion cost ammortised (8%)	$ 479	$ 438	$ 366	$ 314	$ 234	$ 60			$ 60	
Net capital (cost)/benefit per ha	**$ 6,517**	**$ 2,649**	**$ 5,428**	**$ 4,824**	**$ 8,324**	**$ 2,305**			**$ 495**	
Net annual (cost)/benefit per ha ammortised (8%)	**$ 521**	**$ 212**	**$ 434**	**$ 386**	**$ 666**	**$ 184**			**$ 40**	
Capital (Cost)/gain of N under Rule 11	$ (7,743)	$ (3,092)	$ (4,680)	$ (387)	$ (5,979)	$ 102			$ (3)	
Annual (Cost)/gain of N ammortised (8%)	$ (619)	$ (247)	$ (374)	$ (31)	$ (478)	$ 8			$ (0)	
Net capital (cost)/benefit per ha under Rule 11	**$ (1,227)**	**$ (443)**	**$ 749**	**$ 4,437**	**$ 2,345**	**$ 2,407**			**$ 492**	
Net annual (cost)/benefit per ha ammortised (8%)	**$ (98)**	**$ (35)**	**$ 60**	**$ 355**	**$ 188**	**$ 193**			**$ 39**	
Capital (Cost)/gain of N under Draft Nutrient Rules (pNDA)	$ (7,743)	$ (3,092)	$ (4,680)	$ (387)	$ (5,979)	$ 102			$ (3)	
Annual (Cost)/gain of N ammortised (8%)	$ (619)	$ (247)	$ (374)	$ (31)	$ (478)	$ 8			$ (0)	
Net capital (cost)/benefit per ha under Draft Nutrient Rules	**$ (1,227)**	**$ (443)**	**$ 749**	**$ 4,437**	**$ 2,345**	**$ 2,407**			**$ 492**	
Net annual (cost)/benefit per ha ammortised (8%)	**$ (98)**	**$ (35)**	**$ 60**	**$ 355**	**$ 188**	**$ 193**			**$ 39**	

10.12. Bush & scrub LUC 3

Current land use Bush & Scrub LUC 3	Proposed land use									
	Leased pasture (Dairy)	Leased pasture (Drystock)	Leased pasture (Dairy support)	Cut and Carry	Cropping	Forestry (Unowned cutting rights)	Native Bush and Scrub	Gorse	Tree crop (Manuka)	Grazed Trees
Current leaching (hypothetical model)	64.4	25.5	37.6	7.1	57.2	2.5			3.0	
Rule 11 Benchmark							3.0			
pNDA							3.0			
Annual EBIT/Rental	$ 900	$ 550	$ 700	$ 600	$ 800	$ 227	$ -		$ 100	
Change in annual EBIT/ha	$ 900	$ 550	$ 700	$ 600	$ 800	$ 227	$ -		$ 100	
Change in EBIT/ha capitalised (8%)	$ 11,250	$ 6,875	$ 8,750	$ 7,500	$ 10,000	$ 2,837	$ -		$ 1,250	
Cost of conversion (per ha)										
Fencing	$ 756	$ 1,553	$ 648	$ -	$ -	$ -			$ -	
Water reticulation	$ 304	$ 124	$ 124	$ -	$ -	$ -			$ -	
Troughs and fittings	$ 210	$ 130	$ 130	$ -	$ -	$ -			$ -	
Races/Tracks	$ 788	$ -	$ -	$ -	$ -	$ -			$ -	
Re-grassing	$ 1,000	$ 1,000	$ 1,000	$ 1,000	$ -	$ -			$ -	
Capital Fertiliser/Lime	$ 626	$ 370	$ 370	$ 626	$ 626	$ -			$ -	
Planting	$ -	$ -	$ -	$ -	$ -	$ -			$ -	
Clearing and ground preperation	$ 2,200	$ 2,200	$ 2,200	$ 2,200	$ 2,200	$ 655			$ 655	
Afforestation grant						$ -			$ -	
Deforestation liability	$ -	$ -	$ -	$ -	$ -					
Administration/consultancy	$ 100	$ 100	$ 100	$ 100	$ 100	$ 100			$ 100	
Total conversion cost	$ 5,983	$ 5,476	$ 4,572	$ 3,926	$ 2,926	$ 755			$ 755	
Conversion cost ammortised (8%)	$ 479	$ 438	$ 366	$ 314	$ 234	$ 60			$ 60	
Net capital (cost)/benefit per ha	**$ 5,267**	**$ 1,399**	**$ 4,178**	**$ 3,574**	**$ 7,074**	**$ 2,082**			**$ 495**	
Net annual (cost)/benefit per ha ammortised (8%)	**$ 421**	**$ 112**	**$ 334**	**$ 286**	**$ 566**	**$ 167**			**$ 40**	
Capital (Cost)/gain of N under Rule 11	$ (12,892)	$ (4,729)	$ (7,257)	$ (856)	$ (11,386)	$ 107			$ 2	
Annual (Cost)/gain of N ammortised (8%)	$ (1,031)	$ (378)	$ (581)	$ (69)	$ (911)	$ 9			$ 0	
Net capital (cost)/benefit per ha under Rule 11	**$ (7,625)**	**$ (3,330)**	**$ (3,079)**	**$ 2,718**	**$ (4,312)**	**$ 2,189**			**$ 497**	
Net annual (cost)/benefit per ha ammortised (8%)	**$ (610)**	**$ (266)**	**$ (246)**	**$ 217**	**$ (345)**	**$ 175**			**$ 40**	
Capital (Cost)/gain of N under Draft Nutrient Rules (pNDA)	$ (12,892)	$ (4,729)	$ (7,257)	$ (856)	$ (11,386)	$ 107			$ 2	
Annual (Cost)/gain of N ammortised (8%)	$ (1,031)	$ (378)	$ (581)	$ (69)	$ (911)	$ 9			$ 0	
Net capital (cost)/benefit per ha under Draft Nutrient Rules	**$ (7,625)**	**$ (3,330)**	**$ (3,079)**	**$ 2,718**	**$ (4,312)**	**$ 2,189**			**$ 497**	
Net annual (cost)/benefit per ha ammortised (8%)	**$ (610)**	**$ (266)**	**$ (246)**	**$ 217**	**$ (345)**	**$ 175**			**$ 40**	

10.13. Bush & scrub LUC 4

Current land use Bush & Scrub LUC 4	Proposed land use									
	Leased pasture (Dairy)	Leased pasture (Drystock)	Leased pasture (Dairy support)	Cut and Carry	Cropping	Forestry (Unowned cutting rights)	Native Bush and Scrub	Gorse	Tree crop (Manuka)	Grazed Trees
Current leaching (hypothetical model)	62.9	22.9	36.4			2.5			3.0	
Rule 11 Benchmark							3.0			
pNDA							3.0			
Annual EBIT/Rental	$ 800	$ 450	$ 600			$ 173	$ -		$ 100	
Change in annual EBIT/ha	$ 800	$ 450	$ 600			$ 173	$ -		$ 100	
Change in EBIT/ha capitalised (8%)	$ 10,000	$ 5,625	$ 7,500			$ 2,168	$ -		$ 1,250	
Cost of conversion (per ha)										
Fencing	$ 756	$ 1,553	$ 648			$ -			$ -	
Water reticulation	$ 304	$ 124	$ 124			$ -			$ -	
Troughs and fittings	$ 210	$ 130	$ 130			$ -			$ -	
Races/Tracks	$ 788	$ -	$ -			$ -			$ -	
Re-grassing	$ 1,000	$ 1,000	$ 1,000			$ -			$ -	
Capital Fertiliser/Lime	$ 626	$ 370	$ 370			$ -			$ -	
Planting	$ -	$ -	$ -			$ -			$ -	
Clearing and ground preperation	$ 2,200	$ 2,200	$ 2,200			$ 655			$ 655	
Afforestation grant						$ -			$ -	
Deforestation liability	$ -	$ -	$ -							
Administration/consultancy	$ 100	$ 100	$ 100			$ 100			$ 100	
Total conversion cost	$ 5,983	$ 5,476	$ 4,572			$ 755			$ 755	
Conversion cost ammortised (8%)	$ 479	$ 438	$ 366			$ 60			$ 60	
Net capital (cost)/benefit per ha	**$ 4,017**	**$ 149**	**$ 2,928**			**$ 1,413**			**$ 495**	
Net annual (cost)/benefit per ha ammortised (8%)	**$ 321**	**$ 12**	**$ 234**			**$ 113**			**$ 40**	
Capital (Cost)/gain of N under Rule 11	$ (12,576)	$ (4,178)	$ (7,013)			$ 110			$ 5	
Annual (Cost)/gain of N ammortised (8%)	$ (1,006)	$ (334)	$ (561)			$ 9			$ 0	
Net capital (cost)/benefit per ha under Rule 11	**$ (8,559)**	**$ (4,030)**	**$ (4,085)**			**$ 1,522**			**$ 500**	
Net annual (cost)/benefit per ha ammortised (8%)	**$ (685)**	**$ (322)**	**$ (327)**			**$ 122**			**$ 40**	
Capital (Cost)/gain of N under Draft Nutrient Rules (pNDA)	$ (12,574)	$ (4,176)	$ (7,011)			$ 112			$ 7	
Annual (Cost)/gain of N ammortised (8%)	$ (1,006)	$ (334)	$ (561)			$ 9			$ 1	
Net capital (cost)/benefit per ha under Draft Nutrient Rules	**$ (8,557)**	**$ (4,027)**	**$ (4,083)**			**$ 1,524**			**$ 502**	
Net annual (cost)/benefit per ha ammortised (8%)	**$ (685)**	**$ (322)**	**$ (327)**			**$ 122**			**$ 40**	

10.14. Bush & scrub LUC 6

Current land use Bush & Scrub LUC 6	Proposed land use									
	Leased pasture (Dairy)	Leased pasture (Drystock)	Leased pasture (Dairy support)	Cut and Carry	Cropping	Forestry (Unowned cutting rights)	Native Bush and Scrub	Gorse	Tree crop (Manuka)	Grazed Trees
Current leaching (hypothetical model)	49.3	17.7	26.2			2.5			3.0	
Rule 11 Benchmark							3.0			
pNDA							3.0			
Annual EBIT/Rental	$ 600	$ 250	$ 400			$ 133	$ -		$ 100	
Change in annual EBIT/ha	$ 600	$ 250	$ 400			$ 133	$ -		$ 100	
Change in EBIT/ha capitalised (8%)	$ 7,500	$ 3,125	$ 5,000			$ 1,668	$ -		$ 1,250	
Cost of conversion (per ha)										
Fencing	$ 756	$ 1,553	$ 648			$ -			$ -	
Water reticulation	$ 304	$ 124	$ 124			$ -			$ -	
Troughs and fittings	$ 210	$ 130	$ 130			$ -			$ -	
Races/Tracks	$ 788	$ -	$ -			$ -			$ -	
Re-grassing	$ 1,400	$ 1,400	$ 1,400			$ -			$ -	
Capital Fertiliser/Lime	$ 860	$ 541	$ 541			$ -			$ -	
Planting	$ -	$ -	$ -			$ -			$ -	
Clearing and ground preperation	$ 3,200	$ 3,200	$ 3,200			$ 1,105			$ 1,105	
Afforestation grant						$ -			$ -	
Deforestation liability	$ -	$ -	$ -							
Administration/consultancy	$ 100	$ 100	$ 100			$ 100			$ 100	
Total conversion cost	$ 7,617	$ 7,047	$ 6,143			$ 1,205			$ 1,205	
Conversion cost ammortised (8%)	$ 609	$ 564	$ 491			$ 96			$ 96	
Net capital (cost)/benefit per ha	**$ (117)**	**$ (3,922)**	**$ (1,143)**			**$ 463**			**$ 45**	
Net annual (cost)/benefit per ha ammortised (8%)	**$ (9)**	**$ (314)**	**$ (91)**			**$ 37**			**$ 4**	
Capital (Cost)/gain of N under Rule 11	$ (9,712)	$ (3,091)	$ (4,859)			$ 109			$ 4	
Annual (Cost)/gain of N ammortised (8%)	$ (777)	$ (247)	$ (389)			$ 9			$ 0	
Net capital (cost)/benefit per ha under Rule 11	**$ (9,830)**	**$ (7,013)**	**$ (6,002)**			**$ 572**			**$ 49**	
Net annual (cost)/benefit per ha ammortised (8%)	**$ (786)**	**$ (561)**	**$ (480)**			**$ 46**			**$ 4**	
Capital (Cost)/gain of N under Draft Nutrient Rules (pNDA)	$ (9,712)	$ (3,091)	$ (4,859)			$ 109			$ 4	
Annual (Cost)/gain of N ammortised (8%)	$ (777)	$ (247)	$ (389)			$ 9			$ 0	
Net capital (cost)/benefit per ha under Draft Nutrient Rules	**$ (9,830)**	**$ (7,013)**	**$ (6,002)**			**$ 572**			**$ 49**	
Net annual (cost)/benefit per ha ammortised (8%)	**$ (786)**	**$ (561)**	**$ (480)**			**$ 46**			**$ 4**	

10.15. Bush & scrub LUC 7

Current land use Bush & Scrub LUC 7	Proposed land use									
	Leased pasture (Dairy)	Leased pasture (Drystock)	Leased pasture (Dairy support)	Cut and Carry	Cropping	Forestry (Unowned cutting rights)	Native Bush and Scrub	Gorse	Tree crop (Manuka)	Grazed Trees
Current leaching (hypothetical model)						3.0			3.0	
Rule 11 Benchmark							3.0			
pNDA							3.0			
Annual EBIT/Rental						$ 42	$ -		$ 100	
Change in annual EBIT/ha						$ 42	$ -		$ 100	
Change in EBIT/ha capitalised (8%)						$ 521	$ -		$ 1,250	
Cost of conversion (per ha)										
Fencing						$ -			$ -	
Water reticulation						$ -			$ -	
Troughs and fittings						$ -			$ -	
Races/Tracks						$ -			$ -	
Re-grassing						$ -			$ -	
Capital Fertiliser/Lime						$ -			$ -	
Planting						$ -			$ -	
Clearing and ground preperation						$ 1,105			$ 1,105	
Afforestation grant						$ -			$ -	
Deforestation liability										
Administration/consultancy						$ 100			$ 100	
Total conversion cost						$ 1,205			$ 1,205	
Conversion cost ammortised (8%)						$ 96			$ 96	
Net capital (cost)/benefit per ha						**$ (684)**			**$ 45**	
Net annual (cost)/benefit per ha ammortised (8%)						**$ (55)**			**$ 4**	
Capital (Cost)/gain of N under Rule 11						$ -			$ 4	
Annual (Cost)/gain of N ammortised (8%)						$ -			$ 0	
Net capital (cost)/benefit per ha under Rule 11						**$ (684)**			**$ 49**	
Net annual (cost)/benefit per ha ammortised (8%)						**$ (55)**			**$ 4**	
Capital (Cost)/gain of N under Draft Nutrient Rules (pNDA)						$ -			$ 4	
Annual (Cost)/gain of N ammortised (8%)						$ -			$ 0	
Net capital (cost)/benefit per ha under Draft Nutrient Rules						**$ (684)**			**$ 49**	
Net annual (cost)/benefit per ha ammortised (8%)						**$ (55)**			**$ 4**	

10.16. Gorse LUC 2

Current land use Gorse LUC 2	Proposed land use									
	Leased pasture (Dairy)	Leased pasture (Drystock)	Leased pasture (Dairy support)	Cut and Carry	Cropping	Forestry (Unowned cutting rights)	Native Bush and Scrub	Gorse	Tree crop (Manuka)	Grazed Trees
Current leaching (hypothetical model)	38.8	17.4	25.3	4.8	30.3	2.5	3.0		3.0	
Rule 11 Benchmark								11.7		
pNDA								9.9		
Annual EBIT/Rental	$ 1,000	$ 650	$ 800	$ 700	$ 900	$ 245	$ -	$ -	$ 100	
Change in annual EBIT/ha	$ 1,000	$ 650	$ 800	$ 700	$ 900	$ 245	$ -		$ 100	
Change in EBIT/ha capitalised (8%)	$ 12,500	$ 8,125	$ 10,000	$ 8,750	$ 11,250	$ 3,060	$ -		$ 1,250	
Cost of conversion (per ha)										
Fencing	$ 324	$ 518	$ 216	$ -	$ -	$ -	$ -		$ -	
Water reticulation	$ 304	$ 124	$ 124	$ -	$ -	$ -	$ -		$ -	
Troughs and fittings	$ 210	$ 130	$ 130	$ -	$ -	$ -	$ -		$ -	
Races/Tracks	$ 788	$ -	$ -	$ -	$ -	$ -	$ -		$ -	
Re-grassing	$ 1,000	$ 1,000	$ 1,000	$ 1,000	$ -	$ -	$ -		$ -	
Capital Fertiliser/Lime	$ 626	$ 370	$ 370	$ 626	$ 626	$ -	$ -		$ -	
Planting	$ -	$ -	$ -	$ -	$ -	$ -	$ 2,500		$ -	
Clearing and ground preperation	$ 2,200	$ 2,200	$ 2,200	$ 2,200	$ 2,200	$ 655	$ 655		$ 655	
Afforestation grants						$ -	$ -		$ -	
Deforestation liability										
Administration/consultancy	$ 100	$ 100	$ 100	$ 100	$ 100	$ 100	$ 100		$ 100	
Total conversion cost	$ 5,551	$ 4,441	$ 4,140	$ 3,926	$ 2,926	$ 755	$ 3,255		$ 755	
Conversion cost ammortised (8%)	$ 444	$ 355	$ 331	$ 314	$ 234	$ 60	$ 260		$ 60	
Net capital (cost)/benefit per ha	**$ 6,949**	**$ 3,684**	**$ 5,860**	**$ 4,824**	**$ 8,324**	**$ 2,305**	**$ (3,255)**		**$ 495**	
Net annual (cost)/benefit per ha ammortised (8%)	**$ 556**	**$ 295**	**$ 469**	**$ 386**	**$ 666**	**$ 184**	**$ (260)**		**$ 40**	
Capital (Cost)/gain of N under Rule 11 incl Gorse clearing incentive	$ (5,684)	$ (1,188)	$ (2,843)	$ 1,462	$ (3,897)	$ 6,439	$ 6,334		$ 6,334	
Annual (Cost)/gain of N ammortised (8%)	$ (455)	$ (95)	$ (227)	$ 117	$ (312)	$ 515	$ 507		$ 507	
Net capital (cost)/benefit per ha under Rule 11	**$ 1,265**	**$ 2,496**	**$ 3,017**	**$ 6,286**	**$ 4,427**	**$ 8,744**	**$ 3,079**		**$ 6,829**	
Net annual (cost)/benefit per ha ammortised (8%)	**$ 101**	**$ 200**	**$ 241**	**$ 503**	**$ 354**	**$ 700**	**$ 246**		**$ 546**	
Capital (Cost)/gain of N under Draft Nutrient Rules (pNDA)	$ (6,066)	$ (1,570)	$ (3,225)	$ 1,080	$ (4,279)	$ 6,057	$ 5,952		$ 5,952	
Annual (Cost)/gain of N ammortised (8%)	$ (485)	$ (126)	$ (258)	$ 86	$ (342)	$ 485	$ 476		$ 476	
Net capital (cost)/benefit per ha under Draft Nutrient Rules	**$ 883**	**$ 2,114**	**$ 2,636**	**$ 5,904**	**$ 4,045**	**$ 8,362**	**$ 2,697**		**$ 6,447**	
Net annual (cost)/benefit per ha ammortised (8%)	**$ 71**	**$ 169**	**$ 211**	**$ 472**	**$ 324**	**$ 669**	**$ 216**		**$ 516**	

10.17. Gorse LUC 3

Current land use Gorse LUC 3	Proposed land use									
	Leased pasture (Dairy)	Leased pasture (Drystock)	Leased pasture (Dairy support)	Cut and Carry	Cropping	Forestry (Unowned cutting rights)	Native Bush and Scrub	Gorse	Tree crop (Manuka)	Grazed Trees
Current leaching (hypothetical model)	36.0	18.3	26.0	5.6	44.7	2.5	3.0		3.0	
Rule 11 Benchmark								5.7		
pNDA								5.6		
Annual EBIT/Rental	$ 900	$ 550	$ 700	$ 600	$ 800	$ 227	$ -	$ -	$ 100	
Change in annual EBIT/ha	$ 900	$ 550	$ 700	$ 600	$ 800	$ 227	$ -		$ 100	
Change in EBIT/ha capitalised (8%)	$ 11,250	$ 6,875	$ 8,750	$ 7,500	$ 10,000	$ 2,837	$ -		$ 1,250	
Cost of conversion (per ha)										
Fencing	$ 324	$ 518	$ 216	$ -	$ -	$ -	$ -		$ -	
Water reticulation	$ 304	$ 124	$ 124	$ -	$ -	$ -	$ -		$ -	
Troughs and fittings	$ 210	$ 130	$ 130	$ -	$ -	$ -	$ -		$ -	
Races/Tracks	$ 788	$ -	$ -	$ -	$ -	$ -	$ -		$ -	
Re-grassing	$ 1,000	$ 1,000	$ 1,000	$ 1,000	$ -	$ -	$ -		$ -	
Capital Fertiliser/Lime	$ 626	$ 370	$ 370	$ 626	$ 626	$ -	$ -		$ -	
Planting	$ -	$ -	$ -	$ -	$ -	$ -	$ 2,500		$ -	
Clearing and ground preperation	$ 2,200	$ 2,200	$ 2,200	$ 2,200	$ 2,200	$ 655	$ 655		$ 655	
Afforestation grants						$ -	$ -		$ -	
Deforestation liability										
Administration/consultancy	$ 100	$ 100	$ 100	$ 100	$ 100	$ 100	$ 100		$ 100	
Total conversion cost	$ 5,551	$ 4,441	$ 4,140	$ 3,926	$ 2,926	$ 755	$ 3,255		$ 755	
Conversion cost ammortised (8%)	$ 444	$ 355	$ 331	$ 314	$ 234	$ 60	$ 260		$ 60	
Net capital (cost)/benefit per ha	**$ 5,699**	**$ 2,434**	**$ 4,610**	**$ 3,574**	**$ 7,074**	**$ 2,082**	**$ (3,255)**		**$ 495**	
Net annual (cost)/benefit per ha ammortised (8%)	**$ 456**	**$ 195**	**$ 369**	**$ 286**	**$ 566**	**$ 167**	**$ (260)**		**$ 40**	
Capital (Cost)/gain of N under Rule 11 incl Gorse clearing incentive	$ (6,375)	$ (2,656)	$ (4,275)	$ 11	$ (8,196)	$ 5,164	$ 5,059		$ 5,059	
Annual (Cost)/gain of N ammortised (8%)	$ (510)	$ (212)	$ (342)	$ 1	$ (656)	$ 413	$ 405		$ 405	
Net capital (cost)/benefit per ha under Rule 11	**$ (676)**	**$ (222)**	**$ 335**	**$ 3,585**	**$ (1,122)**	**$ 7,246**	**$ 1,804**		**$ 5,554**	
Net annual (cost)/benefit per ha ammortised (8%)	**$ (54)**	**$ (18)**	**$ 27**	**$ 287**	**$ (90)**	**$ 580**	**$ 144**		**$ 444**	
Capital (Cost)/gain of N under Draft Nutrient Rules (pNDA)	$ (6,389)	$ (2,669)	$ (4,289)	$ (2)	$ (8,209)	$ 5,151	$ 5,046		$ 5,046	
Annual (Cost)/gain of N ammortised (8%)	$ (511)	$ (214)	$ (343)	$ (0)	$ (657)	$ 412	$ 404		$ 404	
Net capital (cost)/benefit per ha under Draft Nutrient Rules	**$ (690)**	**$ (236)**	**$ 322**	**$ 3,572**	**$ (1,135)**	**$ 7,233**	**$ 1,791**		**$ 5,541**	
Net annual (cost)/benefit per ha ammortised (8%)	**$ (55)**	**$ (19)**	**$ 26**	**$ 286**	**$ (91)**	**$ 579**	**$ 143**		**$ 443**	

10.18. Gorse LUC 4

Current land use Gorse LUC 4	Proposed land use									
	Leased pasture (Dairy)	Leased pasture (Drystock)	Leased pasture (Dairy support)	Cut and Carry	Cropping	Forestry (Unowned cutting rights)	Native Bush and Scrub	Gorse	Tree crop (Manuka)	Grazed Trees
Current leaching (hypothetical model)	62.9	22.9	36.4			2.5	3.0		3.0	
Rule 11 Benchmark								5.6		
pNDA								6.1		
Annual EBIT/Rental	$ 800	$ 450	$ 600			$ 173	$ -	$ -	$ 100	
Change in annual EBIT/ha	$ 800	$ 450	$ 600			$ 173	$ -		$ 100	
Change in EBIT/ha capitalised (8%)	$ 10,000	$ 5,625	$ 7,500			$ 2,168	$ -		$ 1,250	
Cost of conversion (per ha)										
Fencing	$ 756	$ 1,553	$ 648			$ -	$ -		$ -	
Water reticulation	$ 304	$ 124	$ 124			$ -	$ -		$ -	
Troughs and fittings	$ 210	$ 130	$ 130			$ -	$ -		$ -	
Races/Tracks	$ 788	$ -	$ -			$ -	$ -		$ -	
Re-grassing	$ 1,000	$ 1,000	$ 1,000			$ -	$ -		$ -	
Capital Fertiliser/Lime	$ 626	$ 370	$ 370			$ -	$ -		$ -	
Planting	$ -	$ -	$ -			$ -	$ 2,500		$ -	
Clearing and ground preperation	$ 2,200	$ 2,200	$ 2,200			$ 655	$ 655		$ 655	
Afforestation grants						$ -	$ -		$ -	
Deforestation liability										
Administration/consultancy	$ 100	$ 100	$ 100			$ 100	$ 100		$ 100	
Total conversion cost	$ 5,983	$ 5,476	$ 4,572			$ 755	$ 3,255		$ 755	
Conversion cost ammortised (8%)	$ 479	$ 438	$ 366			$ 60	$ 260		$ 60	
Net capital (cost)/benefit per ha	**$ 4,017**	**$ 149**	**$ 2,928**			**$ 1,413**	**$ (3,255)**		**$ 495**	
Net annual (cost)/benefit per ha ammortised (8%)	**$ 321**	**$ 12**	**$ 234**			**$ 113**	**$ (260)**		**$ 40**	
Capital (Cost)/gain of N under Rule 11 incl Gorse clearing incentive	$ (12,038)	$ (3,640)	$ (6,475)			$ 5,148	$ 5,043		$ 5,043	
Annual (Cost)/gain of N ammortised (8%)	$ (963)	$ (291)	$ (518)			$ 412	$ 403		$ 403	
Net capital (cost)/benefit per ha under Rule 11	**$ (8,022)**	**$ (3,492)**	**$ (3,547)**			**$ 6,560**	**$ 1,788**		**$ 5,538**	
Net annual (cost)/benefit per ha ammortised (8%)	**$ (642)**	**$ (279)**	**$ (284)**			**$ 525**	**$ 143**		**$ 443**	
Capital (Cost)/gain of N under Draft Nutrient Rules (pNDA)	$ (11,933)	$ (3,535)	$ (6,370)			$ 5,253	$ 5,148		$ 5,148	
Annual (Cost)/gain of N ammortised (8%)	$ (955)	$ (283)	$ (510)			$ 420	$ 412		$ 412	
Net capital (cost)/benefit per ha under Draft Nutrient Rules	**$ (7,917)**	**$ (3,387)**	**$ (3,442)**			**$ 6,665**	**$ 1,893**		**$ 5,643**	
Net annual (cost)/benefit per ha ammortised (8%)	**$ (633)**	**$ (271)**	**$ (275)**			**$ 533**	**$ 151**		**$ 451**	

10.19. Gorse LUC 6

Current land use Gorse LUC 6	Proposed land use									
	Leased pasture (Dairy)	Leased pasture (Drystock)	Leased pasture (Dairy support)	Cut and Carry	Cropping	Forestry (Unowned cutting rights)	Native Bush and Scrub	Gorse	Tree crop (Manuka)	Grazed Trees
Current leaching (hypothetical model)	32.3	13.7	18.6			2.5	3.0		3.0	
Rule 11 Benchmark								8.2		
pNDA								9.5		
Annual EBIT/Rental	$ 600	$ 250	$ 400			$ 133	$ -	$ -	$ 100	
Change in annual EBIT/ha	$ 600	$ 250	$ 400			$ 133	$ -		$ 100	
Change in EBIT/ha capitalised (8%)	$ 7,500	$ 3,125	$ 5,000			$ 1,668	$ -		$ 1,250	
Cost of conversion (per ha)										
Fencing	$ 756	$ 1,553	$ 648			$ -	$ -		$ -	
Water reticulation	$ 304	$ 124	$ 124			$ -	$ -		$ -	
Troughs and fittings	$ 210	$ 130	$ 130			$ -	$ -		$ -	
Races/Tracks	$ 788	$ -	$ -			$ -	$ -		$ -	
Re-grassing	$ 1,400	$ 1,400	$ 1,400			$ -	$ -		$ -	
Capital Fertiliser/Lime	$ 860	$ 541	$ 541			$ -	$ -		$ -	
Planting	$ -	$ -	$ -			$ -	$ 2,500		$ -	
Clearing and ground preperation	$ 3,200	$ 3,200	$ 3,200			$ 1,105	$ 1,105		$ 1,105	
Afforestation grants						$ -	$ -		$ -	
Deforestation liability										
Administration/consultancy	$ 100	$ 100	$ 100			$ 100	$ 100		$ 100	
Total conversion cost	$ 7,617	$ 7,047	$ 6,143			$ 1,205	$ 3,705		$ 1,205	
Conversion cost ammortised (8%)	$ 609	$ 564	$ 491			$ 96	$ 296		$ 96	
Net capital (cost)/benefit per ha	**$ (117)**	**$ (3,922)**	**$ (1,143)**			**$ 463**	**$ (3,705)**		**$ 45**	
Net annual (cost)/benefit per ha ammortised (8%)	**$ (9)**	**$ (314)**	**$ (91)**			**$ 37**	**$ (296)**		**$ 4**	
Capital (Cost)/gain of N under Rule 11 incl Gorse clearing incentive	$ (5,061)	$ (1,148)	$ (2,173)			$ 5,704	$ 5,599		$ 5,599	
Annual (Cost)/gain of N ammortised (8%)	$ (405)	$ (92)	$ (174)			$ 456	$ 448		$ 448	
Net capital (cost)/benefit per ha under Rule 11	**$ (5,178)**	**$ (5,070)**	**$ (3,316)**			**$ 6,167**	**$ 1,894**		**$ 5,644**	
Net annual (cost)/benefit per ha ammortised (8%)	**$ (414)**	**$ (406)**	**$ (265)**			**$ 493**	**$ 152**		**$ 452**	
Capital (Cost)/gain of N under Draft Nutrient Rules (pNDA)	$ (4,803)	$ (891)	$ (1,915)			$ 5,961	$ 5,856		$ 5,856	
Annual (Cost)/gain of N ammortised (8%)	$ (384)	$ (71)	$ (153)			$ 477	$ 469		$ 469	
Net capital (cost)/benefit per ha under Draft Nutrient Rules	**$ (4,920)**	**$ (4,813)**	**$ (3,058)**			**$ 6,425**	**$ 2,151**		**$ 5,901**	
Net annual (cost)/benefit per ha ammortised (8%)	**$ (394)**	**$ (385)**	**$ (245)**			**$ 514**	**$ 172**		**$ 472**	

10.20. Gorse LUC 7

Current land use Gorse LUC 7	Proposed land use									
	Leased pasture (Dairy)	Leased pasture (Drystock)	Leased pasture (Dairy support)	Cut and Carry	Cropping	Forestry (Unowned cutting rights)	Native Bush and Scrub	Gorse	Tree crop (Manuka)	Grazed Trees
Current leaching (hypothetical model)						2.5	3.0		3.0	
Rule 11 Benchmark								6.6		
pNDA								8.4		
Annual EBIT/Rental						$ 42	$ -	$ -	$ 100	
Change in annual EBIT/ha						$ 42	$ -		$ 100	
Change in EBIT/ha capitalised (8%)						$ 521	$ -		$ 1,250	
Cost of conversion (per ha)										
Fencing						$ -	$ -		$ -	
Water reticulation						$ -	$ -		$ -	
Troughs and fittings						$ -	$ -		$ -	
Races/Tracks						$ -	$ -		$ -	
Re-grassing						$ -	$ -		$ -	
Capital Fertiliser/Lime						$ -	$ -		$ -	
Planting						$ -	$ -		$ -	
Clearing and ground preperation						$ 1,105	$ 1,105		$ 1,105	
Afforestation grants						$ -	$ -		$ -	
Deforestation liability										
Administration/consultancy						$ 100	$ 100		$ 100	
Total conversion cost						$ 1,205	$ 1,205		$ 1,205	
Conversion cost ammortised (8%)						$ 96	$ 96		$ 96	
Net capital (cost)/benefit per ha						**$ (684)**	**$ (1,205)**		**$ 45**	
Net annual (cost)/benefit per ha ammortised (8%)						**$ (55)**	**$ (96)**		**$ 4**	
Capital (Cost)/gain of N under Rule 11 incl Gorse clearing incentive						$ 5,361	$ 5,256		$ 5,256	
Annual (Cost)/gain of N ammortised (8%)						$ 429	$ 420		$ 420	
Net capital (cost)/benefit per ha under Rule 11						**$ 4,676**	**$ 4,051**		**$ 5,301**	
Net annual (cost)/benefit per ha ammortised (8%)						**$ 374**	**$ 324**		**$ 424**	
Capital (Cost)/gain of N under Draft Nutrient Rules (pNDA)						$ 5,745	$ 5,640		$ 5,640	
Annual (Cost)/gain of N ammortised (8%)						$ 460	$ 451		$ 451	
Net capital (cost)/benefit per ha under Draft Nutrient Rules						**$ 5,060**	**$ 4,435**		**$ 5,685**	
Net annual (cost)/benefit per ha ammortised (8%)						**$ 405**	**$ 355**		**$ 455**	

10.21. Grazed trees LUC 2

Current land use Grazed Trees LUC 2	Proposed land use									
	Leased pasture (Dairy)	Leased pasture (Drystock)	Leased pasture (Dairy support)	Cut and Carry	Cropping	Forestry (Unowned cutting rights)	Native Bush and Scrub	Gorse	Tree crop (Manuka)	Grazed Trees
Current leaching (hypothetical model)	47.6	20.1	29.8	6.0	42.0	2.5	3.0		3.0	
Rule 11 Benchmark										12.9
pNDA										12.9
Annual EBIT/Rental	$ 1,000	$ 650	$ 800	$ 700	$ 900	$ 245	$ -		$ 100	$ 104
Change in annual EBIT/ha	$ 896	$ 546	$ 696	$ 596	$ 796	$ 141	$ (104)		$ (4)	
Change in EBIT/ha capitalised (8%)	$ 11,200	$ 6,825	$ 8,700	$ 7,450	$ 9,950	$ 1,760	$ (1,300)		$ (50)	
Cost of conversion (per ha)										
Fencing	$ 756	$ 1,553	$ 648	$ -	$ -	$ -	$ -		$ -	
Water reticulation	$ 304	$ 124	$ 124	$ -	$ -	$ -	$ -		$ -	
Troughs and fittings	$ 210	$ 130	$ 130	$ -	$ -	$ -	$ -		$ -	
Races/Tracks	$ 788	$ -	$ -	$ -	$ -	$ -	$ -		$ -	
Re-grassing	$ 1,000	$ 1,000	$ 1,000	$ 1,000	$ -	$ -	$ -		$ -	
Capital Fertiliser/Lime	$ 773	$ 490	$ 547	$ 547	$ 773	$ -	$ -		$ -	
Planting	$ -	$ -	$ -	$ -	$ -	$ -	$ 2,500		$ -	
Clearing and ground preperation	$ 2,200	$ 2,200	$ 2,200	$ 2,200	$ 2,200	$ 655	$ 655		$ 655	
Afforestation grant						$ -			$ -	
Deforestation liability										
Administration/consultancy	$ 100	$ 100	$ 100	$ 100	$ 100	$ 100	$ 100		$ 100	
Total conversion cost	$ 6,130	$ 5,596	$ 4,749	$ 3,847	$ 3,073	$ 755	$ 3,255		$ 755	
Conversion cost ammortised (8%)	$ 490	$ 448	$ 380	$ 308	$ 246	$ 60	$ 260		$ 60	
Net capital (cost)/benefit per ha	**$ 5,070**	**$ 1,229**	**$ 3,951**	**$ 3,603**	**$ 6,877**	**$ 1,005**	**$ (4,555)**		**$ (805)**	
Net annual (cost)/benefit per ha ammortised (8%)	**$ 406**	**$ 98**	**$ 316**	**$ 288**	**$ 550**	**$ 80**	**$ (364)**		**$ (64)**	
Capital (Cost)/gain of N under Rule 11	$ (7,282)	$ (1,503)	$ (3,538)	$ 1,458	$ (6,098)	$ 2,193	$ 2,088		$ 2,088	
Annual (Cost)/gain of N ammortised (8%)	$ (583)	$ (120)	$ (283)	$ 117	$ (488)	$ 175	$ 167		$ 167	
Net capital (cost)/benefit per ha under Rule 11	**$ (2,213)**	**$ (274)**	**$ 413**	**$ 5,061**	**$ 779**	**$ 3,198**	**$ (2,467)**		**$ 1,283**	
Net annual (cost)/benefit per ha ammortised (8%)	**$ (177)**	**$ (22)**	**$ 33**	**$ 405**	**$ 62**	**$ 256**	**$ (197)**		**$ 103**	
Capital (Cost)/gain of N under Draft Nutrient Rules (pNDA)	$ (7,282)	$ (1,503)	$ (3,538)	$ 1,458	$ (6,098)	$ 2,193	$ 2,088		$ 2,088	
Annual (Cost)/gain of N ammortised (8%)	$ (583)	$ (120)	$ (283)	$ 117	$ (488)	$ 175	$ 167		$ 167	
Net capital (cost)/benefit per ha under Draft Nutrient Rules	**$ (2,213)**	**$ (274)**	**$ 413**	**$ 5,061**	**$ 779**	**$ 3,198**	**$ (2,467)**		**$ 1,283**	
Net annual (cost)/benefit per ha ammortised (8%)	**$ (177)**	**$ (22)**	**$ 33**	**$ 405**	**$ 62**	**$ 256**	**$ (197)**		**$ 103**	

10.22. Grazed trees LUC 3

Current land use Grazed trees LUC 3	Proposed land use									
	Leased pasture (Dairy)	Leased pasture (Drystock)	Leased pasture (Dairy support)	Cut and Carry	Cropping	Forestry (Unowned cutting rights)	Native Bush and Scrub	Gorse	Tree crop (Manuka)	Grazed Trees
Current leaching (hypothetical model)	54.8	21.8	31.6	6.4	31.4	2.5	3.0		3.0	
Rule 11 Benchmark										12.5
pNDA										12.5
Annual EBIT/Rental	$ 900	$ 550	$ 700	$ 600	$ 800	$ 227	$ -		$ 100	$ 88
Change in annual EBIT/ha	$ 812	$ 462	$ 612	$ 512	$ 712	$ 139	$ (88)		$ 12	
Change in EBIT/ha capitalised (8%)	$ 10,150	$ 5,775	$ 7,650	$ 6,400	$ 8,900	$ 1,737	$ (1,100)		$ 150	
Cost of conversion (per ha)										
Fencing	$ 756	$ 1,553	$ 648	$ -	$ -	$ -	$ -		$ -	
Water reticulation	$ 304	$ 124	$ 124	$ -	$ -	$ -	$ -		$ -	
Troughs and fittings	$ 210	$ 130	$ 130	$ -	$ -	$ -	$ -		$ -	
Races/Tracks	$ 788	$ -	$ -	$ -	$ -	$ -	$ -		$ -	
Re-grassing	$ 1,000	$ 1,000	$ 1,000	$ 1,000	$ -	$ -	$ -		$ -	
Capital Fertiliser/Lime	$ 773	$ 490	$ 547	$ 547	$ 773	$ -	$ -		$ -	
Planting	$ -	$ -	$ -	$ -	$ -	$ -	$ 2,500		$ -	
Clearing and ground preperation	$ 2,200	$ 2,200	$ 2,200	$ 2,200	$ 2,200	$ 655	$ 655		$ 655	
Afforestation grant						$ -			$ -	
Deforestation liability										
Administration/consultancy	$ 100	$ 100	$ 100	$ 100	$ 100	$ 100	$ 100		$ 100	
Total conversion cost	$ 6,130	$ 5,596	$ 4,749	$ 3,847	$ 3,073	$ 755	$ 3,255		$ 755	
Conversion cost ammortised (8%)	$ 490	$ 448	$ 380	$ 308	$ 246	$ 60	$ 260		$ 60	
Net capital (cost)/benefit per ha	**$ 4,020**	**$ 179**	**$ 2,901**	**$ 2,553**	**$ 5,827**	**$ 982**	**$ (4,355)**		**$ (605)**	
Net annual (cost)/benefit per ha ammortised (8%)	**$ 322**	**$ 14**	**$ 232**	**$ 204**	**$ 466**	**$ 79**	**$ (348)**		**$ (48)**	
Capital (Cost)/gain of N under Rule 11	$ (8,879)	$ (1,945)	$ (4,007)	$ 1,293	$ (3,970)	$ 2,108	$ 2,003		$ 2,003	
Annual (Cost)/gain of N ammortised (8%)	$ (710)	$ (156)	$ (321)	$ 103	$ (318)	$ 169	$ 160		$ 160	
Net capital (cost)/benefit per ha under Rule 11	**$ (4,860)**	**$ (1,766)**	**$ (1,106)**	**$ 3,846**	**$ 1,857**	**$ 3,090**	**$ (2,352)**		**$ 1,398**	
Net annual (cost)/benefit per ha ammortised (8%)	**$ (389)**	**$ (141)**	**$ (88)**	**$ 308**	**$ 149**	**$ 247**	**$ (188)**		**$ 112**	
Capital (Cost)/gain of N under Draft Nutrient Rules (pNDA)	$ (8,879)	$ (1,945)	$ (4,007)	$ 1,293	$ (3,970)	$ 2,108	$ 2,003		$ 2,003	
Annual (Cost)/gain of N ammortised (8%)	$ (710)	$ (156)	$ (321)	$ 103	$ (318)	$ 169	$ 160		$ 160	
Net capital (cost)/benefit per ha under Draft Nutrient Rules	**$ (4,860)**	**$ (1,766)**	**$ (1,106)**	**$ 3,846**	**$ 1,857**	**$ 3,090**	**$ (2,352)**		**$ 1,398**	
Net annual (cost)/benefit per ha ammortised (8%)	**$ (389)**	**$ (141)**	**$ (88)**	**$ 308**	**$ 149**	**$ 247**	**$ (188)**		**$ 112**	

10.23. Grazed trees LUC 4

Current land use Grazed trees LUC 4	Proposed land use									
	Leased pasture (Dairy)	Leased pasture (Drystock)	Leased pasture (Dairy support)	Cut and Carry	Cropping	Forestry (Unowned cutting rights)	Native Bush and Scrub	Gorse	Tree crop (Manuka)	Grazed Trees
Current leaching (hypothetical model)	67.4	24.5	38.2			2.5	3.0		3.0	
Rule 11 Benchmark										4.8
pNDA										4.8
Annual EBIT/Rental	$ 800	$ 450	$ 600			$ 173	$ -		$ 100	$ 72
Change in annual EBIT/ha	$ 728	$ 378	$ 528			$ 101	$ (72)		$ 28	
Change in EBIT/ha capitalised (8%)	$ 9,100	$ 4,725	$ 6,600			$ 1,268	$ (900)		$ 350	
Cost of conversion (per ha)										
Fencing	$ 756	$ 1,553	$ 648			$ -	$ -			
Water reticulation	$ 304	$ 124	$ 124			$ -	$ -		$ -	
Troughs and fittings	$ 210	$ 130	$ 130			$ -	$ -		$ -	
Races/Tracks	$ 788	$ -	$ -			$ -	$ -		$ -	
Re-grassing	$ 1,000	$ 1,000	$ 1,000			$ -	$ -		$ -	
Capital Fertiliser/Lime	$ 773	$ 490	$ 547			$ -	$ -		$ -	
Planting	$ -	$ -	$ -			$ -	$ 2,500		$ -	
Clearing and ground preperation	$ 2,200	$ 2,200	$ 2,200			$ 655	$ 655		$ 655	
Afforestation grant						$ -			$ -	
Deforestation liability										
Administration/consultancy	$ 100	$ 100	$ 100			$ 100	$ 100		$ 100	
Total conversion cost	$ 6,130	$ 5,596	$ 4,749			$ 755	$ 3,255		$ 755	
Conversion cost ammortised (8%)	$ 490	$ 448	$ 380			$ 60	$ 260		$ 60	
Net capital (cost)/benefit per ha	**$ 2,970**	**$ (871)**	**$ 1,851**			**$ 513**	**$ (4,155)**		**$ (405)**	
Net annual (cost)/benefit per ha ammortised (8%)	**$ 238**	**$ (70)**	**$ 148**			**$ 41**	**$ (332)**		**$ (32)**	
Capital (Cost)/gain of N under Rule 11	$ (13,138)	$ (4,121)	$ (7,000)			$ 491	$ 386		$ 386	
Annual (Cost)/gain of N ammortised (8%)	$ (1,051)	$ (330)	$ (560)			$ 39	$ 31		$ 31	
Net capital (cost)/benefit per ha under Rule 11	**$ (10,169)**	**$ (4,992)**	**$ (5,149)**			**$ 1,003**	**$ (3,769)**		**$ (19)**	
Net annual (cost)/benefit per ha ammortised (8%)	**$ (813)**	**$ (399)**	**$ (412)**			**$ 80**	**$ (302)**		**$ (2)**	
Capital (Cost)/gain of N under Draft Nutrient Rules (pNDA)	$ (13,138)	$ (4,121)	$ (7,000)			$ 491	$ 386		$ 386	
Annual (Cost)/gain of N ammortised (8%)	$ (1,051)	$ (330)	$ (560)			$ 39	$ 31		$ 31	
Net capital (cost)/benefit per ha under Draft Nutrient Rules	**$ (10,169)**	**$ (4,992)**	**$ (5,149)**			**$ 1,003**	**$ (3,769)**		**$ (19)**	
Net annual (cost)/benefit per ha ammortised (8%)	**$ (813)**	**$ (399)**	**$ (412)**			**$ 80**	**$ (302)**		**$ (2)**	

10.24. Summary of the impact of the Draft Nutrient Rules on profitability of land use change

	Proposed land use							
Hypothetical base model	Leased pasture (Dairy)	Leased pasture (Drystock)	Leased pasture (Dairy support)	Leased Cut and Carry	Leased Cropping	Leased Forestry (Unowned cutting rights)	Native Bush and Scrub	Tree crop (Leased Manuka)
Leased Pasture (Drystock) LUC 2								
Δ in total profitability prior to Rule 11 ($/ha/yr)	$ 98		$ 116	$ (1)	$ 199	$ (413)	$ (858)	$ (558)
Δ in total profitability under Rule 11 assumming N trading ($/ha/yr)	$ (256)		$ 69	$ 399	$ (5)	$ 40	$ (413)	$ (113)
Δ in total profitability under pNDA ($/ha/yr)	$ (350)		$ (25)	$ 304	$ (100)	$ (55)	$ (508)	$ (208)
Δ in profitability Δ assuming most profitable conversion otherwise adopted ($/ha)	**$ (550)**		**$ (225)**	**$ 105**	**$ (299)**	**$ (254)**	**$ (707)**	**$ (407)**
Δ in profitability Δ assuming most profitable conversion under Rule 11 otherwise adopted ($/ha)	**$ (749)**		**$ (424)**	**$ (95)**	**$ (499)**	**$ (454)**	**$ (907)**	**$ (607)**
Leased Pasture (Drystock) LUC 3								
Δ in annual profitability prior to Rule 11 ($/ha)	**$ 98**		**$ 116**	**$ (1)**	$ 199	**$ (331)**	**$ (758)**	**$ (458)**
Δ in annual profitability under Rule 11 ($/ha)	$ (153)		$ 51	$ 303	$ (73)	$ 28	$ (407)	$ (107)
Δ in annual profitability under pNDA ($/ha)	$ (202)		$ 2	$ 254	$ (122)	$ (20)	$ (456)	$ (156)
Δ in profitability Δ assuming most profitable conversion otherwise adopted ($/ha)	**$ (401)**		**$ (197)**	**$ 55**	**$ (321)**	**$ (220)**	**$ (655)**	**$ (355)**
Δ in profitability Δ assuming most profitable conversion under Rule 11 otherwise adopted ($/ha)	**$ (505)**		**$ (301)**	**$ (49)**	**$ (425)**	**$ (323)**	**$ (759)**	**$ (459)**
Leased Pasture (Drystock) LUC 4								
Δ in annual profitability prior to Rule 11 ($/ha)	**$ 98**		**$ 116**			**$ (285)**	**$ (658)**	**$ (358)**
Δ in annual profitability under Rule 11 ($/ha)	$ (126)		$ 82			$ 89	$ (293)	$ 7
Δ in annual profitability under pNDA ($/ha)	$ (166)		$ 43			$ 49	$ (333)	$ (33)
Δ in profitability Δ assuming most profitable conversion otherwise adopted ($/ha)	**$ (282)**		**$ (73)**			**$ (67)**	**$ (448)**	**$ (148)**
Δ in profitability Δ assuming most profitable conversion under Rule 11 otherwise adopted ($/ha)	**$ (254)**		**$ (46)**			**$ (39)**	**$ (421)**	**$ (121)**
Leased Pasture (Dairy Support) LUC 2								
Δ in annual profitability prior to Rule 11 ($/ha)	**$ (31)**	**$ (262)**		**$ (130)**	**$ 70**	**$ (563)**	**$ (1,008)**	**$ (708)**
Δ in annual profitability under Rule 11 ($/ha)	$ (463)	$ (259)		$ 110	$ (248)	$ (276)	$ (729)	$ (429)
Δ in annual profitability under pNDA ($/ha)	$ (505)	$ (301)		$ 68	$ (290)	$ (318)	$ (771)	$ (471)
Δ in profitability Δ assuming most profitable conversion otherwise adopted ($/ha)	**$ (575)**	**$ (371)**		**$ (2)**	**$ (360)**	**$ (388)**	**$ (841)**	**$ (541)**
Δ in profitability Δ assuming most profitable conversion under Rule 11 otherwise adopted ($/ha)	**$ (615)**	**$ (410)**		**$ (42)**	**$ (400)**	**$ (428)**	**$ (881)**	**$ (581)**
Leased Pasture (Dairy Support) LUC 3								
Δ in annual profitability prior to Rule 11 ($/ha)	**$ (31)**	**$ (262)**		**$ (130)**	**$ 70**	**$ (481)**	**$ (908)**	**$ (608)**
Δ in annual profitability under Rule 11 ($/ha)	$ (559)	$ (16)		$ 337	$ (335)	$ 66	$ (369)	$ (69)
Δ in annual profitability under pNDA ($/ha)	$ (672)	$ (129)		$ 225	$ (447)	$ (47)	$ (482)	$ (182)
Δ in profitability Δ assuming most profitable conversion otherwise adopted ($/ha)	**$ (742)**	**$ (199)**		**$ 155**	**$ (518)**	**$ (117)**	**$ (552)**	**$ (252)**
Δ in profitability Δ assuming most profitable conversion under Rule 11 otherwise adopted ($/ha)	**$ (1,009)**	**$ (466)**		**$ (113)**	**$ (785)**	**$ (384)**	**$ (819)**	**$ (519)**
Leased Pasture (Cut & Carry) LUC 2								
Δ in annual profitability prior to Rule 11 ($/ha)	**$ 82**	**$ (120)**	**$ 72**		**$ 192**	**$ (463)**	**$ (908)**	**$ (608)**
Δ in annual profitability under Rule 11 ($/ha)	$ (330)	$ (65)	$ (51)		$ (83)	$ (100)	$ (553)	$ (253)
Δ in annual profitability under pNDA ($/ha)	$ (411)	$ (146)	$ (132)		$ (164)	$ (181)	$ (634)	$ (334)
Δ in profitability Δ assuming most profitable conversion otherwise adopted ($/ha)	**$ (603)**	**$ (338)**	**$ (324)**		**$ (356)**	**$ (373)**	**$ (826)**	**$ (526)**
Δ in profitability Δ assuming most profitable conversion under Rule 11 otherwise adopted ($/ha)	**$ (359)**	**$ (94)**	**$ (81)**		**$ (112)**	**$ (130)**	**$ (583)**	**$ (283)**
Leased Pasture (Cut & Carry) LUC 3								
Δ in annual profitability prior to Rule 11 ($/ha)	**$ 82**	**$ (120)**	**$ 72**		**$ 192**	**$ (381)**	**$ (808)**	**$ (508)**
Δ in annual profitability under Rule 11 ($/ha)	$ (320)	$ (63)	$ (29)		$ (71)	$ (32)	$ (468)	$ (168)
Δ in annual profitability under pNDA ($/ha)	$ (398)	$ (141)	$ (107)		$ (149)	$ (111)	$ (546)	$ (246)
Δ in profitability Δ assuming most profitable conversion otherwise adopted ($/ha)	**$ (590)**	**$ (333)**	**$ (299)**		**$ (341)**	**$ (303)**	**$ (738)**	**$ (438)**
Δ in profitability Δ assuming most profitable conversion under Rule 11 otherwise adopted ($/ha)	**$ (369)**	**$ (112)**	**$ (78)**		**$ (120)**	**$ (81)**	**$ (517)**	**$ (217)**
Forestry LUC 2								
Δ in annual profitability prior to Rule 11 ($/ha)	**$ 277**	**$ (33)**	**$ 189**	**$ 141**	**$ 421**		**$ (505)**	**$ (205)**
Δ in annual profitability under Rule 11 ($/ha)	$ (341)	$ (278)	$ (195)	$ 109	$ (71)		$ (504)	$ (204)
Δ in annual profitability under pNDA ($/ha)	$ (341)	$ (278)	$ (195)	$ 109	$ (71)		$ (504)	$ (204)
Δ in profitability Δ assuming most profitable conversion otherwise adopted ($/ha)	**$ (762)**	**$ (699)**	**$ (616)**	**$ (312)**	**$ (492)**		**$ (925)**	**$ (625)**
Δ in profitability Δ assuming most profitable conversion under Rule 11 otherwise adopted ($/ha)	**$ (450)**	**$ (387)**	**$ (303)**	**$ -**	**$ (180)**		**$ (613)**	**$ (313)**
Forestry LUC 3								
Δ in annual profitability prior to Rule 11 ($/ha)	$ 194	$ (115)	$ 107	$ 59	**$ 339**		**$ (487)**	$ (187)
Δ in annual profitability under Rule 11 ($/ha)	$ (628)	$ (429)	$ (361)	$ (2)	$ (380)		$ (496)	$ (196)
Δ in annual profitability under pNDA ($/ha)	$ (628)	$ (429)	$ (361)	$ (2)	$ (380)		$ (496)	$ (196)
Δ in profitability Δ assuming most profitable conversion otherwise adopted ($/ha)	**$ (967)**	**$ (767)**	**$ (700)**	**$ (341)**	**$ (719)**		**$ (835)**	**$ (535)**
Δ in profitability Δ assuming most profitable conversion under Rule 11 otherwise adopted ($/ha)	**$ (626)**	**$ (426)**	**$ (359)**	**$ -**	**$ (378)**		**$ (493)**	**$ (193)**
Forestry LUC 4								
Δ in annual profitability prior to Rule 11 ($/ha)	**$ 148**	**$ (162)**	**$ 61**				**$ (434)**	**$ (134)**
Δ in annual profitability under Rule 11 ($/ha)	$ (848)	$ (498)	$ (502)				$ (442)	$ (142)
Δ in annual profitability under pNDA ($/ha)	$ (849)	$ (498)	$ (502)				$ (442)	$ (142)
Δ in profitability Δ assuming most profitable conversion otherwise adopted ($/ha)	**$ (996)**	**$ (646)**	**$ (650)**				**$ (590)**	**$ (290)**
Δ in profitability Δ assuming most profitable conversion under Rule 11 otherwise adopted ($/ha)	**$ (707)**	**$ (356)**	**$ (360)**				**$ (300)**	**$ (0)**
Bush & Scrub LUC 2								
Δ in annual profitability prior to Rule 11 ($/ha)	**$ 521**	**$ 212**	**$ 434**	**$ 386**	**$ 666**	**$ 184**		**$ 40**
Δ in annual profitability under Rule 11 ($/ha)	$ (98)	$ (35)	$ 60	$ 355	$ 188	$ 193		$ 39
Δ in annual profitability under pNDA ($/ha)	$ (98)	$ (35)	$ 60	$ 355	$ 188	$ 193		$ 39
Δ in profitability Δ assuming most profitable conversion otherwise adopted ($/ha)	**$ (764)**	**$ (701)**	**$ (606)**	**$ (311)**	**$ (478)**	**$ (473)**		**$ (627)**
Δ in profitability Δ assuming most profitable conversion under Rule 11 otherwise adopted ($/ha)	**$ (453)**	**$ (390)**	**$ (295)**	**$ -**	**$ (167)**	**$ (162)**		**$ (316)**

Hypothetical base model	Proposed land use							
	Leased pasture (Dairy)	Leased pasture (Drystock)	Leased pasture (Dairy support)	Leased Cut and Carry	Leased Cropping	Leased Forestry (Unowned cutting rights)	Native Bush and Scrub	Tree crop (Leased Manuka)
Bush & Scrub LUC 3								
Δ in annual profitability prior to Rule 11 ($/ha)	$ 421	$ 112	$ 334	$ 286	$ 566	$ 167		$ 40
Δ in annual profitability under Rule 11 ($/ha)	$ (610)	$ (266)	$ (246)	$ 217	$ (345)	$ 175		$ 40
Δ in annual profitability under pNDA ($/ha)	$ (610)	$ (266)	$ (246)	$ 217	$ (345)	$ 175		$ 40
Δ in profitability Δ assuming most profitable conversion otherwise adopted ($/ha)	**$ (1,176)**	**$ (832)**	**$ (812)**	**$ (349)**	**$ (911)**	**$ (391)**		**$ (526)**
Δ in profitability Δ assuming most profitable conversion under Rule 11 otherwise adopted ($/ha)	**$ (827)**	**$ (484)**	**$ (464)**	**$ -**	**$ (562)**	**$ (42)**		**$ (178)**
Bush & Scrub LUC 4								
Δ in annual profitability prior to Rule 11 ($/ha)	$ 321	$ 12	$ 234			$ 113		$ 40
Δ in annual profitability under Rule 11 ($/ha)	$ (685)	$ (322)	$ (327)			$ 122		$ 40
Δ in annual profitability under pNDA ($/ha)	$ (685)	$ (322)	$ (327)			$ 122		$ 40
Δ in profitability Δ assuming most profitable conversion otherwise adopted ($/ha)	**$ (1,006)**	**$ (644)**	**$ (648)**			**$ (199)**		**$ (281)**
Δ in profitability Δ assuming most profitable conversion under Rule 11 otherwise adopted ($/ha)	**$ (806)**	**$ (444)**	**$ (448)**			**$ 0**		**$ (82)**
Bush & Scrub LUC 6								
Δ in annual profitability prior to Rule 11 ($/ha)	$ (9)	$ (314)	$ (91)			$ 37		$ 4
Δ in annual profitability under Rule 11 ($/ha)	$ (786)	$ (561)	$ (480)			$ 46		$ 4
Δ in annual profitability under pNDA ($/ha)	$ (786)	$ (561)	$ (480)			$ 46		$ 4
Δ in profitability Δ assuming most profitable conversion otherwise adopted ($/ha)	**$ (823)**	**$ (598)**	**$ (517)**			**$ 9**		**$ (33)**
Δ in profitability Δ assuming most profitable conversion under Rule 11 otherwise adopted ($/ha)	**$ (832)**	**$ (607)**	**$ (526)**			**$ -**		**$ (42)**
Bush & Scrub LUC 7								
Δ in annual profitability prior to Rule 11 ($/ha)						$ (55)		$ 4
Δ in annual profitability under Rule 11 ($/ha)						$ (55)		$ 4
Δ in annual profitability under pNDA ($/ha)						$ (55)		$ 4
Δ in profitability Δ assuming most profitable conversion otherwise adopted ($/ha)						**$ (58)**		**$ 0**
Δ in profitability Δ assuming most profitable conversion under Rule 11 otherwise adopted ($/ha)						**$ (59)**		**$ -**
Gorse LUC 2								
Δ in annual profitability prior to Rule 11 ($/ha)	$ 556	$ 295	$ 469	$ 386	$ 666	$ 184	$ (260)	$ 40
Δ in annual profitability under Rule 11 ($/ha)	$ 101	$ 200	$ 241	$ 503	$ 354	$ 700	$ 246	$ 546
Δ in annual profitability under pNDA ($/ha)	$ 71	$ 169	$ 211	$ 472	$ 324	$ 669	$ 216	$ 516
Δ in profitability Δ assuming most profitable conversion otherwise adopted ($/ha)	**$ (595)**	**$ (497)**	**$ (455)**	**$ (194)**	**$ (342)**	**$ 3**	**$ (450)**	**$ (150)**
Δ in profitability Δ assuming most profitable conversion under Rule 11 otherwise adopted ($/ha)	**$ (629)**	**$ (530)**	**$ (489)**	**$ (227)**	**$ (376)**	**$ (31)**	**$ (484)**	**$ (184)**
Gorse LUC 3								
Δ in annual profitability prior to Rule 11 ($/ha)	$ 456	$ 195	$ 369	$ 286	$ 566	$ 167	$ (260)	$ 40
Δ in annual profitability under Rule 11 ($/ha)	$ (54)	$ (18)	$ 27	$ 287	$ (90)	$ 580	$ 144	$ 444
Δ in annual profitability under pNDA ($/ha)	$ (55)	$ (19)	$ 26	$ 286	$ (91)	$ 579	$ 143	$ 443
Δ in profitability Δ assuming most profitable conversion otherwise adopted ($/ha)	**$ (621)**	**$ (585)**	**$ (540)**	**$ (280)**	**$ (1)**	**$ 13**	**$ (423)**	**$ (123)**
Δ in profitability Δ assuming most profitable conversion under Rule 11 otherwise adopted ($/ha)	**$ (635)**	**$ (599)**	**$ (554)**	**$ (294)**	**$ (670)**	**$ (1)**	**$ (436)**	**$ (136)**
Gorse LUC 4								
Δ in annual profitability prior to Rule 11 ($/ha)	$ 321	$ 12	$ 234			$ 113	$ (260)	$ 40
Δ in annual profitability under Rule 11 ($/ha)	$ (642)	$ (279)	$ (284)			$ 525	$ 143	$ 443
Δ in annual profitability under pNDA ($/ha)	$ (633)	$ (271)	$ (275)			$ 533	$ 151	$ 451
Δ in profitability Δ assuming most profitable conversion otherwise adopted ($/ha)	**$ (955)**	**$ (592)**	**$ (597)**			**$ 212**	**$ (170)**	**$ 130**
Δ in profitability Δ assuming most profitable conversion under Rule 11 otherwise adopted ($/ha)	**$ (1,158)**	**$ (796)**	**$ (800)**			**$ 8**	**$ (373)**	**$ (73)**
Gorse LUC 6								
Δ in annual profitability prior to Rule 11 ($/ha)	$ (9)	$ (314)	$ (91)			$ 37	$ (296)	$ 4
Δ in annual profitability under Rule 11 ($/ha)	$ (414)	$ (406)	$ (265)			$ 493	$ 152	$ 452
Δ in annual profitability under pNDA ($/ha)	$ (394)	$ (385)	$ (245)			$ 514	$ 172	$ 472
Δ in profitability Δ assuming most profitable conversion otherwise adopted ($/ha)	**$ (431)**	**$ (422)**	**$ (282)**			**$ 477**	**$ 135**	**$ 435**
Δ in profitability Δ assuming most profitable conversion under Rule 11 otherwise adopted ($/ha)	**$ (887)**	**$ (878)**	**$ (738)**			**$ 21**	**$ (321)**	**$ (21)**
Gorse LUC 7								
Δ in annual profitability prior to Rule 11 ($/ha)						$ (55)		$ 4
Δ in annual profitability under Rule 11 ($/ha)						$ 374		$ 424
Δ in annual profitability under pNDA ($/ha)						$ 405		$ 455
Δ in profitability Δ assuming most profitable conversion otherwise adopted ($/ha)						**$ 401**		**$ 451**
Δ in profitability Δ assuming most profitable conversion under Rule 11 otherwise adopted ($/ha)						**$ (19)**		**$ 31**
Grazed trees LUC 2								
Δ in annual profitability prior to Rule 11 ($/ha)	$ 406	$ 98	$ 316	$ 288	$ 550	$ 80	$ (364)	$ (64)
Δ in annual profitability under Rule 11 ($/ha)	$ (177)	$ (22)	$ 33	$ 405	$ 62	$ 256	$ (197)	$ 103
Δ in annual profitability under pNDA ($/ha)	$ (177)	$ (22)	$ 33	$ 405	$ 62	$ 256	$ (197)	$ 103
Δ in profitability Δ assuming most profitable conversion otherwise adopted ($/ha)	**$ (727)**	**$ (572)**	**$ (517)**	**$ (145)**	**$ (488)**	**$ (294)**	**$ (748)**	**$ (448)**
Δ in profitability Δ assuming most profitable conversion under Rule 11 otherwise adopted ($/ha)	**$ (582)**	**$ (427)**	**$ (372)**	**$ -**	**$ (343)**	**$ (149)**	**$ (602)**	**$ (302)**
Grazed trees LUC 3								
Δ in annual profitability prior to Rule 11 ($/ha)	$ 322	$ 14	$ 232	$ 204	$ 466	$ 79	$ (348)	$ (48)
Δ in annual profitability under Rule 11 ($/ha)	$ (389)	$ (141)	$ (88)	$ 308	$ 149	$ 247	$ (188)	$ 112
Δ in annual profitability under pNDA ($/ha)	$ (389)	$ (141)	$ (88)	$ 308	$ 149	$ 247	$ (188)	$ 112
Δ in profitability Δ assuming most profitable conversion otherwise adopted ($/ha)	**$ (855)**	**$ (607)**	**$ (555)**	**$ (158)**	**$ (318)**	**$ (219)**	**$ (654)**	**$ (354)**
Δ in profitability Δ assuming most profitable conversion under Rule 11 otherwise adopted ($/ha)	**$ (696)**	**$ (449)**	**$ (396)**	**$ -**	**$ (159)**	**$ (61)**	**$ (496)**	**$ (196)**
Grazed trees LUC 4								
Δ in annual profitability prior to Rule 11 ($/ha)	$ 238	$ (70)	$ 148			$ 41	$ (332)	$ (32)
Δ in annual profitability under Rule 11 ($/ha)	$ (813)	$ (399)	$ (412)			$ 80	$ (302)	$ (2)
Δ in annual profitability under pNDA ($/ha)	$ (813)	$ (399)	$ (412)			$ 80	$ (302)	$ (2)
Δ in profitability Δ assuming most profitable conversion otherwise adopted ($/ha)	**$ (1,051)**	**$ (637)**	**$ (649)**			**$ (157)**	**$ (539)**	**$ (239)**
Δ in profitability Δ assuming most profitable conversion under Rule 11 otherwise adopted ($/ha)	**$ (894)**	**$ (480)**	**$ (492)**			**$ -**	**$ (382)**	**$ (82)**

10.25. Forestry annuity and lease summary

LUC	300 Index	Slope (degrees)	Annual costs (incl	HTR	Annuity	Risk margin for lease	Lease
2	36.9	5	80	$ 50	$ 288	15%	$ 245
3	36.5	10	75	$ 52	$ 267	15%	$ 227
4	36.1	20	70	$ 58	$ 204	15%	$ 173
6	35.3	30	65	$ 63	$ 157	15%	$ 133
7	34.9	35	60	$ 73	$ 49	15%	$ 42

- 300 Index is the average annual volume increment/ha/year;
- Annual costs include rates
- HTR is harvesting, transport, and roading costs;
- Annuity is the annual payments that achieve an equivalent Net Present Value at 8% discount rate;
- Lease is in $/ha/year.

10.25.1. Forestry LUC 2

Radiata Pine Calculator Version 4.0 Pro — Registered User: Graham West

Stand information			
	300-index	36.9	
	Site index (m)	31.7	Survival
Save as defaults	Stems/ha planted	833	95%
	Rotation age (years)	26	
Restore defaults	Altitude (m)	350	
	Latitude (°S)	38	

Run

Stand parameters at clear-felling

Age	DBH	MTH	SPH	BA	Vol	MH
26	52.9	38.7	380	83.4	1068.7	36.9

BIX	Juvenile	PLI	Density	SED	SED (pr)	Grazing
4.90	58.5%	0.000	356	27	0	0%

Prunings		Prune 1	Prune 2	Prune 3	Prune 4	Prune 5
Schedule for DOS	Age at pruning (years)					
	Pruned height (m)					
Schedule for GCL	Stems per hectare					
	Target DOS (cm)					
Schedule for both	Target green crown length (m)					

Pruning results	Prune 1	Prune 2	Prune 3	Prune 4	Prune 5
DOS (cm)					
GCL at pruning (m)					
MTH at pruning (m)					
FC pruned SPH					
FC pruned TSV (m^3)					

Thinnings		Thin 1	Thin 2	Thin 3	Thin 4	Thin 5
	Age at thinning (years)	8.8				
	SPH after thinning	400				
Adjust last thinning to achieve target FCS	Thinning coefficient	0.78				
	Production or waste (P/W)	W				
	Target final crop stocking					

Thinning results	Thin 1	Thin 2	Thin 3	Thin 4	Thin 5
MTH at thinning	13.8				
SPH before thin	785				
SPH thinnings	385				
DBH thinnings (cm)	26.2				
Vol thinnings (m3/ha)	105				

Financial		
	Annual fixed costs ($/ha)	80
	Establishment costs (cents/tree)	100
	Clearfell Logging Cost ($/m3)	50
	Production Thin Logging Cost ($/m3	45
	Labour Cost ($/hr)	30
	Labour Supervision (%)	15
	Discount rate (%)	8

Model Adjustments	
Mort +	0.00
Mort x	0.00
Drift	-0.05

Land & livestock		
	Land Value ($/ha)	0
	Livestock Carrying Capacity (LSU/h	10
	Livestock capital value ($/LSU)	70
	Livestock Gross Margin ($/lsu/yr)	0
	Understorey grazing (Y/N)	N

Calibrate indices	
Age (years)	0
Stocking (sph)	0
DBH (cm)	
Basal area (m2/ha)	0
Volume (m3/ha)	
MTH (m)	0.0
MH (m)	

Estimate 300-index and Site index

Volume by log grades ☐ Grades A ☑ Grades B

Log grade	Thin 1	Thin 2	Thin 3	Thin 4	Thin 5	Clearfell
Pruned						
AL						379
AM						
KL						140
KM						1
S3L3						263
Pulp						127
Merchant	0					908
Waste	105					160

Log quality		
	Clearfell yield (%)	85
	Thinning Yield Reduction (%)	10
	B.H. Outerwood Density (kg/m3)	420
	Density measurement age (yrs)	15
	Pruned log sweep (mm/m)	8
	Soil C (%)	5.3
	Soil N (%)	0.37
	Mean annual temperature (°C)	12
	Theoretical clearfell yield (%)	96

Economic results

NPV	LEV	IRR	EFGM	Stumpage	Value/m^3	Labour
$ 3,109	$ 3,595	13.11%	$ 37.1	$ 36,299	$ 90	26.9

Economic calculations and details- values entered into the pale green cells will be automatically used next time the user interfa

Financial		
	Annual fixed costs ($/ha)	80
	Establishment costs (cents/tree)	100
	Clearfell Logging Cost ($/m3)	50
	Production Thin Logging Cost ($/m3)	45
	Labour Cost ($/hr)	30
	Labour Supervision (%)	15
	Discount rate (%)	8

Land & livestock		
	Land Value ($/ha)	0
	Livestock Carrying Capacity (LSU/ha)	10
	Livestock capital value ($/LSU)	70
	Livestock Gross Margin ($/lsu/yr)	0
	Understorey grazing (Y/N)	N

Plant & release		
	Plant time per plant (min.)	1.036
	Release time per plant (min.)	0.145
	Supervision multiplier	1.100

Pruning labour		
	Slope (degrees)	5.000
	Hindrance (scale: 1-4)	2.000
	Supervision multiplier	1.100

Waste thin labour		
	Slope (degrees)	5.000
	Hindrance (scale: 1-4)	2.000
	Supervision multiplier	1.100

Economic results		
	NPV ($/ha)	$ 3,109
	LEV ($/ha)	$ 3,595
	Annuity ($/yr)	$ 288
	IRR (%)	13.1%
	EFGM ($/lsu)	$ 37.1
	Cost/m3	$ 52
	Labour hours	26.89
	Value/m3	$ 90
	Merchantable volume	908

Additional costs	Text	Year	Cost ($/ha)
	Poisoning possums	2.0	$ 20
	Spraying dothistroma	8.0	$ 25

Value by log grade

	Clearfell	Thin 1	Thin 2	Thin 3	Thin 4	Thin 5	Prices
Pruned	$ -	$ -	$ -	$ -	$ -	$ -	120
AL	$41,683	$ -	$ -	$ -	$ -	$ -	110
AM	$ -	$ -	$ -	$ -	$ -	$ -	110
KL	$13,822	$ -	$ -	$ -	$ -	$ -	99
KM	$ 60	$ -	$ -	$ -	$ -	$ -	99
S3L3	$19,698	$ -	$ -	$ -	$ -	$ -	75
Pulp	$ 6,455	$ -	$ -	$ -	$ -	$ -	51
	$ -	$ -	$ -	$ -	$ -	$ -	0
	$ -	$ -	$ -	$ -	$ -	$ -	0
	$ -	$ -	$ -	$ -	$ -	$ -	0
Revenue	**$81,717**	$ -	$ -	$ -	$ -	$ -	

Cost of thinnings and clear felling

Age	26.0	8.8	0.0	0.0	0.0	0.0
Volume	908	105				
Stems	380	385				
Waste/Prod./Clearfell	C	W				
Time per tree (min.)		1.226	0.000	0.000	0.000	0.000
Cost	**$ 45,418**	$ 236	$ -	$ -	$ -	$ -

Cost of pruning

Age						
Stems	0	0	0	0	0	
Time per tree (min.)	0.0	0.0	0.0	0.0	0.0	
Hours worked	0.0	0.0	0.0	0.0	0.0	
Cost	$ -	$ -	$ -	$ -	$ -	

10.25.2. Forestry LUC 3

Radiata Pine Calculator Version 4.0 Pro — **Registered User: Graham West**

Stand information		
	300-index	36.5
	Site index (m)	31.7
	Stems/ha planted	833
	Rotation age (years)	26
	Altitude (m)	350
	Latitude (°S)	38

Save as defaults | Restore defaults | Survival 95% | Run

Stand parameters at clear-felling

Age	DBH	MTH	SPH	BA	Vol	MH
26	52.6	38.7	379	82.4	1056.6	36.9

BIX	Juvenile	PLI	Density	SED	SED (pr)	Grazing
4.85	58.2%	0.000	356	27	0	0%

Prunings		Prune 1	Prune 2	Prune 3	Prune 4	Prune 5
Schedule for DOS	Age at pruning (years)					
	Pruned height (m)					
Schedule for GCL	Stems per hectare					
	Target DOS (cm)					
Schedule for both	Target green crown length (m)					

Pruning results	Prune 1	Prune 2	Prune 3	Prune 4	Prune 5
DOS (cm)					
GCL at pruning (m)					
MTH at pruning (m)					
FC pruned SPH					
FC pruned TSV (m^3)					

Thinnings		Thin 1	Thin 2	Thin 3	Thin 4	Thin 5
	Age at thinning (years)	8.8				
	SPH after thinning	400				
Adjust last thinning to achieve target FCS	Thinning coefficient	0.78				
	Production or waste (P/W)	W				
	Target final crop stocking					

Thinning results	Thin 1	Thin 2	Thin 3	Thin 4	Thin 5
MTH at thinning	13.8				
SPH before thin	785				
SPH thinnings	385				
DBH thinnings (cm)	25.9				
Vol thinnings (m3/ha)	103				

Financial		
	Annual fixed costs ($/ha)	75
	Establishment costs (cents/tree)	100
	Clearfell Logging Cost ($/m3)	52
	Production Thin Logging Cost ($/m3	45
	Labour Cost ($/hr)	30
	Labour Supervision (%)	15
	Discount rate (%)	8

Land & livestock		
	Land Value ($/ha)	0
	Livestock Carrying Capacity (LSU/h	10
	Livestock capital value ($/LSU)	70
	Livestock Gross Margin ($/lsu/yr)	0
	Understorey grazing (Y/N)	N

Log quality		
	Clearfell yield (%)	85
	Thinning Yield Reduction (%)	10
	B.H. Outerwood Density (kg/m3)	420
	Density measurement age (yrs)	15
	Pruned log sweep (mm/m)	8
	Soil C (%)	5.3
	Soil N (%)	0.37
	Mean annual temperature (°C)	12
	Theoretical clearfell yield (%)	96

Model Adjustments	
Mort +	0.00
Mort x	0.00
Drift	-0.05

Calibrate indices	
Age (years)	0
Stocking (sph)	0
DBH (cm)	
Basal area (m2/ha)	0
Volume (m3/ha)	
MTH (m)	0.0
MH (m)	

Estimate 300-index and Site index

Volume by log grades — ☐ Grades A ☑ Grades B

Log grade	Thin 1	Thin 2	Thin 3	Thin 4	Thin 5	Clearfell
Pruned						
AL						374
AM						
KL						144
KM						1
S3L3						257
Pulp						123
Merchant.	0					898
Waste	103					158

Economic results

NPV	LEV	IRR	EFGM	Stumpage	Value/m^3	Labour
$ 2,887	$ 3,339	12.95%	$ 34.5	$ 34,263	$ 90	27.0

Economic calculations and details- values entered into the pale green cells will be automatically used next time the user interfac

Financial		
	Annual fixed costs ($/ha)	75
	Establishment costs (cents/tree)	100
	Clearfell Logging Cost ($/m3)	52
	Production Thin Logging Cost ($/m3)	45
	Labour Cost ($/hr)	30
	Labour Supervision (%)	15
	Discount rate (%)	8

Land & livestock		
	Land Value ($/ha)	0
	Livestock Carrying Capacity (LSU/ha)	10
	Livestock capital value ($/LSU)	70
	Livestock Gross Margin ($/lsu/yr)	0
	Understorey grazing (Y/N)	N

Plant & release		
	Plant time per plant (min.)	1.036
	Release time per plant (min.)	0.145
	Supervision multiplier	1.100

Pruning labour		
	Slope (degrees)	10.000
	Hindrance (scale: 1-4)	2.000
	Supervision multiplier	1.100

Waste thin labour		
	Slope (degrees)	10.000
	Hindrance (scale: 1-4)	2.000
	Supervision multiplier	1.100

Economic results		
	NPV ($/ha)	$ 2,887
	LEV ($/ha)	$ 3,339
	Annuity ($/yr)	$ 267
	IRR (%)	13.0%
	EFGM ($/lsu)	$ 34.5
	Cost/m3	$ 54
	Labour hours	27.03
	Value/m3	$ 90
	Merchantable volume	898

Additional costs	Text	Year	Cost ($/ha)
	Poisoning possums	2.0	$ 20
	Spraying dothistroma	8.0	$ 25

Value by log grade

	Clearfell	Thin 1	Thin 2	Thin 3	Thin 4	Thin 5	Prices
Pruned	$ -	$ -	$ -	$ -	$ -	$ -	120
AL	$41,126	$ -	$ -	$ -	$ -	$ -	110
AM	$ -	$ -	$ -	$ -	$ -	$ -	110
KL	$14,222	$ -	$ -	$ -	$ -	$ -	99
KM	$ 83	$ -	$ -	$ -	$ -	$ -	99
S3L3	$19,272	$ -	$ -	$ -	$ -	$ -	75
Pulp	$ 6,261	$ -	$ -	$ -	$ -	$ -	51
	$ -	$ -	$ -	$ -	$ -	$ -	0
	$ -	$ -	$ -	$ -	$ -	$ -	0
	$ -	$ -	$ -	$ -	$ -	$ -	0
Revenue	**$80,964**	$ -	$ -	$ -	$ -	$ -	

Cost of thinnings and clear felling

Age	26.0	8.8	0.0	0.0	0.0	0.0
Volume	898	103				
Stems	379	385				
Waste/Prod./Clearfell	C	W				
Time per tree (min.)		1.248	0.000	0.000	0.000	0.000
Cost	**$46,701**	$ 240	$ -	$ -	$ -	$ -

Cost of pruning

Age						
Stems	0	0	0	0	0	
Time per tree (min.)	0.0	0.0	0.0	0.0	0.0	
Hours worked	0.0	0.0	0.0	0.0	0.0	
Cost	$ -	$ -	$ -	$ -	$ -	

10.25.3. Forestry LUC 4

Radiata Pine Calculator Version 4.0 Pro — **Registered User: Graham West**

Stand information			Survival
Save as defaults	300-index	36.1	
	Site index (m)	31.7	95%
	Stems/ha planted	833	
Restore defaults	Rotation age (years)	26	
	Altitude (m)	350	
	Latitude (°S)	38	

Run

Stand parameters at clear-felling

Age	DBH	MTH	SPH	BA	Vol	MH
26	52.3	38.7	379	81.5	1044.4	36.9

BIX	Juvenile	PLI	Density	SED	SED (pr)	Grazing
4.79	57.8%	0.000	356	27	0	0%

Prunings		Prune 1	Prune 2	Prune 3	Prune 4	Prune 5
Schedule for DOS	Age at pruning (years)					
	Pruned height (m)					
Schedule for GCL	Stems per hectare					
	Target DOS (cm)					
Schedule for both	Target green crown length (m)					

Pruning results	Prune 1	Prune 2	Prune 3	Prune 4	Prune 5
DOS (cm)					
GCL at pruning (m)					
MTH at pruning (m)					
FC pruned SPH					
FC pruned TSV (m^3)					

Thinnings		Thin 1	Thin 2	Thin 3	Thin 4	Thin 5
	Age at thinning (years)	8.8				
	SPH after thinning	400				
Adjust last thinning to achieve target FCS	Thinning coefficient	0.78				
	Production or waste (P/W)	W				
	Target final crop stocking					

Thinning results	Thin 1	Thin 2	Thin 3	Thin 4	Thin 5
MTH at thinning	13.8				
SPH before thin	785				
SPH thinnings	385				
DBH thinnings (cm)	25.7				
Vol thinnings (m3/ha)	101				

Financial		
	Annual fixed costs ($/ha)	70
	Establishment costs (cents/tree)	100
	Clearfell Logging Cost ($/m3)	58
	Production Thin Logging Cost ($/$m^3$)	45
	Labour Cost ($/hr)	30
	Labour Supervision (%)	15
	Discount rate (%)	8

Model Adjustments	
Mort +	0.00
Mort x	0.00
Drift	-0.05

Land & livestock		
	Land Value ($/ha)	0
	Livestock Carrying Capacity (LSU/h	10
	Livestock capital value ($/LSU)	70
	Livestock Gross Margin ($/lsu/yr)	0
	Understorey grazing (Y/N)	N

Calibrate indices	
Age (years)	0
Stocking (sph)	0
DBH (cm)	
Basal area (m2/ha)	0
Volume (m3/ha)	
MTH (m)	0.0
MH (m)	

Estimate 300-index and Site index

Volume by log grades — ☐ Grades A ☑ Grades B

Log grade	Thin 1	Thin 2	Thin 3	Thin 4	Thin 5	Clearfell
Pruned						
AL						349
AM						
KL						177
KM						1
S3L3						250
Pulp						111
Merchant	0					888
Waste	101					157

Log quality		
	Clearfell yield (%)	85
	Thinning Yield Reduction (%)	10
	B.H. Outerwood Density (kg/m3)	420
	Density measurement age (yrs)	15
	Pruned log sweep (mm/m)	8
	Soil C (%)	5.3
	Soil N (%)	0.37
	Mean annual temperature (°C)	12
	Theoretical clearfell yield (%)	96

Economic results

NPV	LEV	IRR	EFGM	Stumpage	Value/m^3	Labour
$ 2,208	$ 2,554	12.21%	$ 27.7	$ 28,916	$ 91	27.8

Economic calculations and details- Values entered into the pale green cells will be automatically used next time the user interfac

Financial		
	Annual fixed costs ($/ha)	70
	Establishment costs (cents/tree)	100
	Clearfell Logging Cost ($/m3)	58
	Production Thin Logging Cost ($/m3)	45
	Labour Cost ($/hr)	30
	Labour Supervision (%)	15
	Discount rate (%)	8

Land & livestock		
	Land Value ($/ha)	0
	Livestock Carrying Capacity (LSU/ha)	10
	Livestock capital value ($/LSU)	70
	Livestock Gross Margin ($/lsu/yr)	0
	Understorey grazing (Y/N)	N

Plant & release		
	Plant time per plant (min.)	1.036
	Release time per plant (min.)	0.145
	Supervision multiplier	1.100

Pruning labour		
	Slope (degrees)	20.000
	Hindrance (scale: 1-4)	2.000
	Supervision multiplier	1.100

Waste thin labour		
	Slope (degrees)	20.000
	Hindrance (scale: 1-4)	2.000
	Supervision multiplier	1.100

Economic results		
	NPV ($/ha)	$ 2,208
	LEV ($/ha)	$ 2,554
	Annuity ($/yr)	$ 204
	IRR (%)	12.2%
	EFGM ($/lsu)	$ 27.7
	Cost/m3	$ 60
	Labour hours	27.82
	Value/m3	$ 91
	Merchantable volume	888

Additional costs	Text	Year	Cost ($/ha)
	Poisoning possums	2.0	$ 20
	Spraying dothistroma	8.0	$ 25

Value by log grade

	Clearfell	Thin 1	Thin 2	Thin 3	Thin 4	Thin 5	Prices
Pruned	$ -	$ -	$ -	$ -	$ -	$ -	120
AL	$38,336	$ -	$ -	$ -	$ -	$ -	110
AM	$ -	$ -	$ -	$ -	$ -	$ -	110
KL	$17,568	$ -	$ -	$ -	$ -	$ -	99
KM	$ 83	$ -	$ -	$ -	$ -	$ -	99
S3L3	$18,779	$ -	$ -	$ -	$ -	$ -	75
Pulp	$ 5,636	$ -	$ -	$ -	$ -	$ -	51
	$ -	$ -	$ -	$ -	$ -	$ -	0
	$ -	$ -	$ -	$ -	$ -	$ -	0
	$ -	$ -	$ -	$ -	$ -	$ -	0
Revenue	**$80,403**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	

Cost of thinnings and clear felling

Age	26.0	8.8	0.0	0.0	0.0	0.0
Volume	888	101				
Stems	379	385				
Waste/Prod./Clearfell	C	W				
Time per tree (min.)		1.372	0.000	0.000	0.000	0.000
Cost	**$ 51,487**	**$ 264**	**$ -**	**$ -**	**$ -**	**$ -**

Cost of pruning

Age						
Stems	0	0	0	0	0	
Time per tree (min.)	0.0	0.0	0.0	0.0	0.0	
Hours worked	0.0	0.0	0.0	0.0	0.0	
Cost	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	

10.25.4. Forestry LUC 6

Radiata Pine Calculator Version 4.0 Pro Registered User: Graham West

Stand information			
	300-index	35.3	
	Site index (m)	31.7	Survival
Save as defaults	Stems/ha planted	833	95%
	Rotation age (years)	26	
Restore defaults	Altitude (m)	350	
	Latitude (°S)	38	

Run

Stand parameters at clear-felling						
Age	DBH	MTH	SPH	BA	Vol	MH
26	51.7	38.7	379	79.6	1020.0	36.9

BIX	Juvenile	PLI	Density	SED	SED (pr)	Grazing
4.67	#VALUE!	0.000	357	27	0	0%

Prunings		Prune 1	Prune 2	Prune 3	Prune 4	Prune 5
Schedule for DOS	Age at pruning (years)					
	Pruned height (m)					
Schedule for GCL	Stems per hectare					
	Target DOS (cm)					
Schedule for both	Target green crown length (m)					

Pruning results	Prune 1	Prune 2	Prune 3	Prune 4	Prune 5
DOS (cm)					
GCL at pruning (m)					
MTH at pruning (m)					
FC pruned SPH					
FC pruned TSV (m^3)					

Thinnings		Thin 1	Thin 2	Thin 3	Thin 4	Thin 5
	Age at thinning (years)	8.8				
	SPH after thinning	400				
Adjust last thinning to achieve target FCS	Thinning coefficient	0.78				
	Production or waste (P/W)	W				
	Target final crop stocking					

Thinning results	Thin 1	Thin 2	Thin 3	Thin 4	Thin 5
MTH at thinning	13.8				
SPH before thin	785				
SPH thinnings	385				
DBH thinnings (cm)	25.2				
Vol thinnings (m3/ha)	97				

Financial		
	Annual fixed costs ($/ha)	65
	Establishment costs (cents/tree)	100
	Clearfell Logging Cost ($/m3)	63
	Production Thin Logging Cost ($/m3	45
	Labour Cost ($/hr)	30
	Labour Supervision (%)	15
	Discount rate (%)	8
Land & livestock	Land Value ($/ha)	0
	Livestock Carrying Capacity (LSU/h	10
	Livestock capital value ($/LSU)	70
	Livestock Gross Margin ($/lsu/yr)	0
	Understorey grazing (Y/N)	N
Log quality	Clearfell yield (%)	85
	Thinning Yield Reduction (%)	10
	B.H. Outerwood Density (kg/m3)	420
	Density measurement age (yrs)	15
	Pruned log sweep (mm/m)	8
	Soil C (%)	5.3
	Soil N (%)	0.37
	Mean annual temperature (°C)	12
	Theoretical clearfell yield (%)	96

Model Adjustments	
Mort +	0.00
Mort x	0.00
Drift	-0.05

Calibrate indices	
Age (years)	0
Stocking (sph)	0
DBH (cm)	
Basal area (m2/ha)	0
Volume (m3/ha)	
MTH (m)	0.0
MH (m)	

Estimate 300-index and Site index

Volume by log grades ☐ Grades A ☑ Grades B

Log grade	Thin 1	Thin 2	Thin 3	Thin 4	Thin 5	Clearfell
Pruned						
AL						351
AM						
KL						191
KM						1
S3L3						230
Pulp						95
Merchant.	0					867
Waste	97					153

Economic results						
NPV	LEV	IRR	EFGM	Stumpage	Value/m^3	Labour
$ 1,693	$ 1,957	11.52%	$ 22.4	$ 24,999	$ 92	30.6

Economic calculations and details- values entered into the pale green cells will be automatically used next time the user interf

Financial		
	Annual fixed costs ($/ha)	65
	Establishment costs (cents/tree)	100
	Clearfell Logging Cost ($/m3)	63
	Production Thin Logging Cost ($/m3)	45
	Labour Cost ($/hr)	30
	Labour Supervision (%)	15
	Discount rate (%)	8
Land & livestock	Land Value ($/ha)	0
	Livestock Carrying Capacity (LSU/ha)	10
	Livestock capital value ($/LSU)	70
	Livestock Gross Margin ($/lsu/yr)	0
	Understorey grazing (Y/N)	N
Plant & release	Plant time per plant (min.)	1.036
	Release time per plant (min.)	0.145
	Supervision multiplier	1.100
Pruning labour	Slope (degrees)	30.000
	Hindrance (scale: 1-4)	2.000
	Supervision multiplier	1.100
Waste thin labour	Slope (degrees)	30.000
	Hindrance (scale: 1-4)	2.000
	Supervision multiplier	1.100
Economic results	NPV ($/ha)	$ 1,693
	LEV ($/ha)	$ 1,957
	Annuity ($/yr)	$ 157
	IRR (%)	11.5%
	EFGM ($/lsu)	$ 22.4
	Cost/m3	$ 65
	Labour hours	30.59
	Value/m3	$ 92
	Merchantable volume	867

Additional costs	Text	Year	Cost ($/ha)
	Poisoning possums	2.0	$ 20
	Spraying dothistroma	8.0	$ 25

Value by log grade							
	Clearfell	Thin 1	Thin 2	Thin 3	Thin 4	Thin 5	Prices
Pruned	$ -	$ -	$ -	$ -	$ -	$ -	120
AL	$38,567	$ -	$ -	$ -	$ -	$ -	110
AM	$ -	$ -	$ -	$ -	$ -	$ -	110
KL	$18,876	$ -	$ -	$ -	$ -	$ -	99
KM	$ 106	$ -	$ -	$ -	$ -	$ -	99
S3L3	$17,231	$ -	$ -	$ -	$ -	$ -	75
Pulp	$ 4,842	$ -	$ -	$ -	$ -	$ -	51
	$ -	$ -	$ -	$ -	$ -	$ -	0
	$ -	$ -	$ -	$ -	$ -	$ -	0
	$ -	$ -	$ -	$ -	$ -	$ -	0
Revenue	$79,622	$ -	$ -	$ -	$ -	$ -	

Cost of thinnings and clear felling						
Age	26.0	8.8	0.0	0.0	0.0	0.0
Volume	867	97				
Stems	379	385				
Waste/Prod./Clearfell	C	W				
Time per tree (min.)		1.803	0.000	0.000	0.000	0.000
Cost	$ 54,623	$ 347	$ -	$ -	$ -	$ -

Cost of pruning						
Age						
Stems	0	0	0	0	0	
Time per tree (min.)	0.0	0.0	0.0	0.0	0.0	
Hours worked	0.0	0.0	0.0	0.0	0.0	
Cost	$ -	$ -	$ -	$ -	$ -	

10.25.5. Forestry LUC 7

Radiata Pine Calculator Version 4.0 Pro — Registered User: Graham West

Stand information			
	300-index	34.9	
	Site index (m)	31.7	Survival
Save as defaults	Stems/ha planted	833	95%
	Rotation age (years)	26	
Restore defaults	Altitude (m)	350	
	Latitude (°S)	38	

Run

Stand parameters at clear-felling						
Age	DBH	MTH	SPH	BA	Vol	MH
26	51.4	38.7	378	78.6	1008.0	36.9

BIX	Juvenile	PLI	Density	SED	SED (pr)	Grazing
4.63	56.8%	0.000	357	26	0	0%

Prunings		Prune 1	Prune 2	Prune 3	Prune 4	Prune 5
Schedule for DOS	Age at pruning (years)					
	Pruned height (m)					
Schedule for GCL	Stems per hectare					
	Target DOS (cm)					
Schedule for both	Target green crown length (m)					

Pruning results	Prune 1	Prune 2	Prune 3	Prune 4	Prune 5
DOS (cm)					
GCL at pruning (m)					
MTH at pruning (m)					
FC pruned SPH					
FC pruned TSV (m^3)					

Thinnings		Thin 1	Thin 2	Thin 3	Thin 4	Thin 5
	Age at thinning (years)	8.8				
	SPH after thinning	400				
Adjust last thinning to achieve target FCS	Thinning coefficient	0.78				
	Production or waste (P/W)	W				
	Target final crop stocking					

Thinning results	Thin 1	Thin 2	Thin 3	Thin 4	Thin 5
MTH at thinning	13.8				
SPH before thin	785				
SPH thinnings	385				
DBH thinnings (cm)	25.0				
Vol thinnings (m3/ha)	95				

Financial		
	Annual fixed costs ($/ha)	60
	Establishment costs (cents/tree)	100
	Clearfell Logging Cost ($/m3)	73
	Production Thin Logging Cost ($/m3	45
	Labour Cost ($/hr)	30
	Labour Supervision (%)	15
	Discount rate (%)	8

Land & livestock		
	Land Value ($/ha)	0
	Livestock Carrying Capacity (LSU/h	10
	Livestock capital value ($/LSU)	70
	Livestock Gross Margin ($/lsu/yr)	0
	Understorey grazing (Y/N)	N

Log quality		
	Clearfell yield (%)	85
	Thinning Yield Reduction (%)	10
	B.H. Outerwood Density (kg/m3)	420
	Density measurement age (yrs)	15
	Pruned log sweep (mm/m)	8
	Soil C (%)	5.3
	Soil N (%)	0.37
	Mean annual temperature (°C)	12
	Theoretical clearfell yield (%)	96

Model Adjustments	
Mort +	0.00
Mort x	0.00
Drift	-0.05

Calibrate indices	
Age (years)	0
Stocking (sph)	0
DBH (cm)	
Basal area (m2/ha)	0
Volume (m3/ha)	
MTH (m)	0.0
MH (m)	

Estimate 300-index and Site index

Volume by log grades	☐ Grades A	☑ Grades B				
Log grade	Thin 1	Thin 2	Thin 3	Thin 4	Thin 5	Clearfell
Pruned						
AL						345
AM						
KL						191
KM						1
S3L3						232
Pulp						88
Merchant.	0					857
Waste	95					151

Economic results						
NPV	LEV	IRR	EFGM	Stumpage	Value/m^3	Labour
$ 532	$ 616	9.41%	$ 11.2	$ 16,294	$ 92	33.2

Economic calculations and details- values entered into the pale green cells will be automatically used next time the user interfac

Financial		
	Annual fixed costs ($/ha)	60
	Establishment costs (cents/tree)	100
	Clearfell Logging Cost ($/m3)	73
	Production Thin Logging Cost ($/m3)	45
	Labour Cost ($/hr)	30
	Labour Supervision (%)	15
	Discount rate (%)	8

Land & livestock		
	Land Value ($/ha)	0
	Livestock Carrying Capacity (LSU/ha)	10
	Livestock capital value ($/LSU)	70
	Livestock Gross Margin ($/lsu/yr)	0
	Understorey grazing (Y/N)	N

Plant & release		
	Plant time per plant (min.)	1.036
	Release time per plant (min.)	0.145
	Supervision multiplier	1.100

Pruning labour		
	Slope (degrees)	35.000
	Hindrance (scale: 1-4)	2.000
	Supervision multiplier	1.100

Waste thin labour		
	Slope (degrees)	35.000
	Hindrance (scale: 1-4)	2.000
	Supervision multiplier	1.100

Economic results		
	NPV ($/ha)	$ 532
	LEV ($/ha)	$ 616
	Annuity ($/yr)	$ 49
	IRR (%)	9.4%
	EFGM ($/lsu)	$ 11.2
	Cost/m3	$ 75
	Labour hours	33.19
	Value/m3	$ 92
	Merchantable volume	857

Additional costs	Text	Year	Cost ($/ha)
	Poisoning possums	2.0	$ 20
	Spraying dothistroma	8.0	$ 25

Value by log grade	Clearfell	Thin 1	Thin 2	Thin 3	Thin 4	Thin 5	Prices
Pruned	$ -	$ -	$ -	$ -	$ -	$ -	120
AL	$37,946	$ -	$ -	$ -	$ -	$ -	110
AM	$ -	$ -	$ -	$ -	$ -	$ -	110
KL	$18,912	$ -	$ -	$ -	$ -	$ -	99
KM	$ 107	$ -	$ -	$ -	$ -	$ -	99
S3L3	$17,406	$ -	$ -	$ -	$ -	$ -	75
Pulp	$ 4,471	$ -	$ -	$ -	$ -	$ -	51
	$ -	$ -	$ -	$ -	$ -	$ -	0
	$ -	$ -	$ -	$ -	$ -	$ -	0
	$ -	$ -	$ -	$ -	$ -	$ -	0
Revenue	$78,842	$ -	$ -	$ -	$ -	$ -	

Cost of thinnings and clear felling						
Age	26.0	8.8	0.0	0.0	0.0	0.0
Volume	857	95				
Stems	378	385				
Waste/Prod./Clearfell	C	W				
Time per tree (min.)		2.208	0.000	0.000	0.000	0.000
Cost	$ 62,547	$ 425	$ -	$ -	$ -	$ -

Cost of pruning						
Age						
Stems	0	0	0	0	0	
Time per tree (min.)	0.0	0.0	0.0	0.0	0.0	
Hours worked	0.0	0.0	0.0	0.0	0.0	
Cost	$ -	$ -	$ -	$ -	$ -	