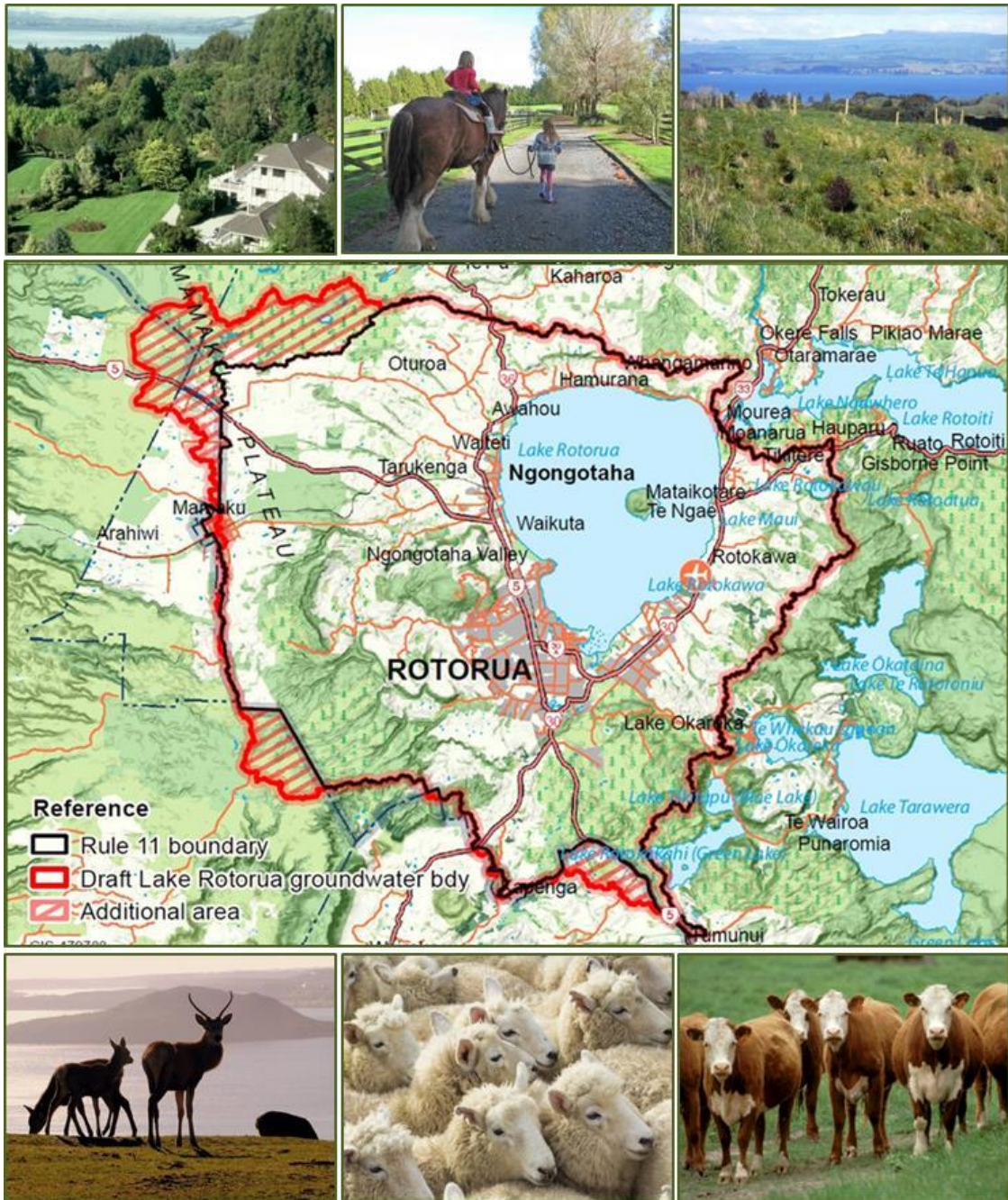


Lake Rotorua Catchment Small Block Sector Review



November 2015
Prepared by Landconnect Ltd

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EXECUTIVE SUMMARY

Bay of Plenty Regional Council (BOPRC) has set a sustainable annual nitrogen load target for Lake Rotorua of 435 tonnes of nitrogen (N). New rules are being developed to limit the nitrogen loss from land-based activities by allocating nitrogen to the various land use sectors and to individual properties via Nitrogen Discharge Allowances (NDAs). The information presented in this report is intended to assist with the development of the [Draft Nitrogen Rules](#) and how these rules may impact on Small Block owners. Small Blocks are defined as less than 40 hectares, consistent with the draft rules context.

Overview of the Small Block Sector

- Using Valuation References as a measure of properties indicates that there are 1,484 Small Blocks in the Lake Rotorua Catchment. However this is likely to be an overestimate, as a single property may be made up of more than one Valuation Reference. A review of multiple Valuation References associated with benchmarked properties (<40ha) indicates that the total number assumed benchmark-equivalent properties could be 1,389. However, the sample used for this estimate is small.
- The Small Block sector covers 5,634 hectares across the catchment, making up 13% of total rural land (41,760 ha) in the catchment.
- Most Small Blocks are less than 4 hectares (1,045, 70% of total Small Blocks) covering 1,104 hectares, but only 18.5% of total land in the Small Block sector.

People Living on Small Blocks

- An estimated 3,188 people or 5.7% of the total catchment population live on Small Blocks.
- Approximately 70% of Small Blocker owners (2,215) live on properties less than four hectares.

Tenure of Small Blocks

- Maori land makes up 11% of total Small Block area, based on the Rule 11 surface catchment. This is proportionally lower than Maori land in the Rule 11 catchment (24%).

Land use in the Small Block Sector

- The effective land area (pastoral, cut and carry, crop and horticulture, plus grazed trees) in the Small Block Sector is 4,155 hectares. This is 19% of the total effective land area in the catchment (22,112 ha).
- Drystock is the most common effective land use in Small Blocks (90%, 3,755 ha) followed by Dairy Support (6%, 265 ha). The Dairy Support category will be under-represented because that land use is only assigned when a property has been benchmarked.

Small Blocks as Business Units for Agricultural Production Purposes

- Very few Small Blocks <4ha are registered for GST (2%).
- Agricultural GST registration (i.e. generally earning >\$60k per annum) is much higher in the 10-40 ha range, indicating these owners have businesses more aligned with commercial farmers.
- Research indicates that while the majority of Small Block owners are engaged in some form of production from the land, generally this did not solely support their households.

Land Valuation

- The 2014 total land value (rating valuations) of the Small Block Sector is just under \$389 million or 49% of the total value of rural land in the catchment (\$800 million).

Attitudes to Environmental Practice

- Local research indicates Small Block owners tend to have low awareness about nutrient discharges and land use changes that reduce nutrient losses. Low awareness was linked to Small Block owners not having access to information from agricultural organisations to the same degree as farmers on large holdings. Low awareness was also linked to Small Block owners placing less importance on nutrient management.
- The two larger studies (regional and national) indicated that Small Block owners did not voluntarily engage in environmentally friendly practices and environmental monitoring to the same extent as seen in larger holdings. However, many Small Block owners intended to protect or encourage growth of native bush.

Estimates of Nitrogen Loss from the Small Block Sector

- A total of 58 Small Blocks have been benchmarked, covering 1,016 total hectares and 855 effective hectares. The latter is 21% of the total Small Block sector effective area of 4085 hectares (excluding dairy and grazed trees). Estimates of total Small Block N loss and potential 2032 NDA reductions were extrapolated from this 21% “sample”.
- A pro-rata area-banded extrapolation of known benchmarks and provisional NDAs to the full Small Block sector gave a total potential reduction of 11.7 tN/yr, based on the current draft rules and allocation scheme. This nitrogen reduction amount is relative to a status quo N loss estimate based on extrapolating known Small Block benchmarks to the full Small Block sector.
- Alternative Small Block extrapolations gave reductions ranging from 2.6 to 16.5 tN/yr, dependant on what proportion of Small Blocks were assumed to be permitted (@18 kgN/ha/yr) or given the default derived drystock NDA (@24.7 kgN/ha/yr).
- The “simple” pro-rata Small Block extrapolation of 11.7 tN/yr represents 13% of the total drystock sector reduction of 86 tN/yr.
- An 11.7 tN/yr reduction is 4.4% of the 264 tN/yr total pastoral sector total reduction envisaged under the draft rules, based on OVERSEER® 6.2.0 values. The Small Block contribution rises to 5-6% of total pastoral N reductions under alternative Small Block pNDA assumptions.

1 Background

A water quality target has been set with the community for Lake Rotorua. To reach the target substantial reductions in nitrogen losses are needed across the Lake Rotorua catchment. These reductions will have social, cultural and economic impacts, both locally and across the region.

Bay of Plenty Regional Council (BOPRC) has set a sustainable annual nitrogen load target for Lake Rotorua of 435 tonnes of nitrogen (N). New rules are being developed to limit the nitrogen discharges from land-based activities by allocating nitrogen to the various land use sectors and individual properties. The information presented in this report is intended to assist Bay of Plenty Regional Council with the development of the [Draft Nitrogen Rules](#) and how these rules may impact on Small Block owners.

2 Defining Rural Small Blocks in the Lake Rotorua Groundwater Catchment

There is no single data source that encompasses an everyday description of a rural “property”. Land in the catchment is measured in ‘parcels’, however within the rural sector a property is often comprised of many such parcels. In this review, Land Valuation Reference data from Rotorua Lakes Council have been matched to BOPRC GIS parcels within the Lake Rotorua groundwater catchment boundary.

It is important to note that using Valuation References to approximate ‘properties’ has limitations. One property may comprise more than one Valuation Reference - this will occur more frequently on larger properties. **More generally, various assumptions were necessary to derive outputs in this report and these should all be treated as estimates, both for percentage value and whole number results.**

For most of this review (except Section 8), Small Blocks will be referred to as Small Blocks^{VR} to ensure that the reader is reminded of the data source and associated limitations. Section 9 considers nitrogen losses and is based on benchmarked properties, some of which comprise multiple Valuation References.

This review assesses small blocks both in terms of total property area and “effective area”. Overall, 74% (4,155 ha) of the total Small Blocks^{VR} area (5,634 ha) is effective area i.e. pastoral, cultivated land and grazed trees. This definition excludes production forestry, as per draft rules definition of effective area.

Other Definitions

- This review covers data and mapping within [the Lake Rotorua Groundwater Boundary](#).
- Small Blocks^{VR} are defined as 0.05-40 hectares and, where relevant, are described in the following area bands: 0.5 – 0.4 ha; 0.4-2ha; 2-4ha; 4-10ha; 10-20ha; 20-30ha; and 30-40ha¹.
- ‘Rural’ land use has been assigned to Small Blocks^{VR} using the Notified 2014 Rotorua Lakes Council Proposed Rural Plan zones.
- Drystock includes sheep, beef, deer and other drystock on grazed pasture and fodder crops.
- All smaller Valuation References that are part of larger benchmarked properties (40+ha) were excluded (i.e. 240 out of 1,724 Valuation References were excluded).
- Valuation References (<40 hectares) that straddled the groundwater catchment boundary were included if at least 50% of that land was inside the catchment.
- Valuation References for Urban Open Space, Roading and Lake/waterway land uses were excluded.
- Valuation References associated with public ownership were also excluded (DoC, Transpower etc)

See Appendix 1 for more detailed descriptions of the definitions, maps and datasets used in this review.

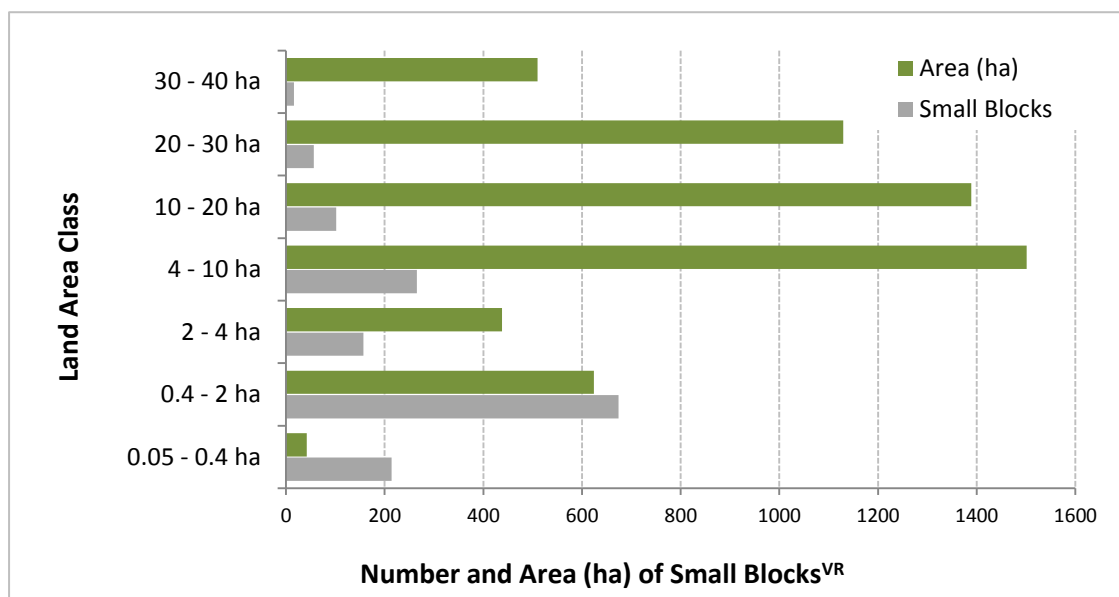
¹ There are no “overlaps” in these area band categories because GIS records block area data to seven decimal places.

3 Small Block Sector Overview

3.1 Number of Small Blocks - Count of Valuation References

- Using Valuation References as a measure of properties indicates that there are 1,484 Small Blocks^{VR} in the Lake Rotorua Catchment covering 5,634 hectares as summarised in Figure 1 and mapped in Figure 3 below.
- Most Small Blocks^{VR} are less than 4 hectares (1,045, 70% of total Small Blocks^{VR}) covering 1,104 hectares, but only 18.5% of total land in the Small Block^{VR} sector.

FIGURE 1: NUMBER AND AREA OF SMALL BLOCKS^{VR}



Small Blocks ^{VR}	.05 - 0.4 ha	0.4 - 2 ha	2 - 4 ha	4 - 10 ha	10 - 20 ha	20 - 30 ha	30 - 40 ha	Total
Number	214	674	157	265	102	56	16	1,484
Hectares	42	624	438	1,501	1,389	1,129	510	5,634

3.2 Number of Small Blocks - Count of Valuation References within Benchmarked Properties

The estimated number of Small Blocks^{VR} within the catchment (1,484) above is likely to be an overestimate as a single property may be comprised of more than one Valuation Reference. To explore this issue, an analysis of Valuation References for benchmarked properties (<40ha) was undertaken using BOPRC staff local knowledge and GIS mapping.

This analysis indicated:

- Smaller benchmarked properties (<4 ha) had a single Valuation Reference.
- Eight out of the 54 benchmarked properties between 4- 40 ha had multiple Valuation References and were operating as single property units. If this small sample is representative of the wider Small Block Sector, the total number of assumed benchmark-equivalent properties between 4-40 ha (439) would be 22% less than the count of Valuation References. This equates to 1,389 properties <40 ha.

Subsequent sections of this report (through to section 8) focus on Valuation References i.e. Small Block^{VR} with a total count of 1,484.

3.3 Small Blocks as a Percentage of the Rural Lake Rotorua Groundwater Catchment

The total land area in the Lake Rotorua groundwater catchment area is 45,721 ha. The 2014 Proposed District Plan definitions and maps are used to determine “rural”. Excluding the urban zoned area (3,961 ha), the total rural area in the catchment is 41,760 ha. The Small BlockVR sector accounts for 13% of rural land in the catchment, as illustrated in Figure 2 below.

FIGURE 2: SMALL BLOCKS^{VR} AS PERCENT OF THE RURAL CATCHMENT

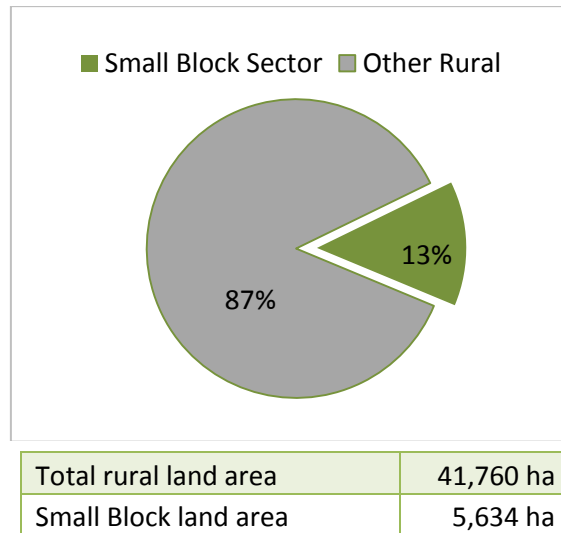
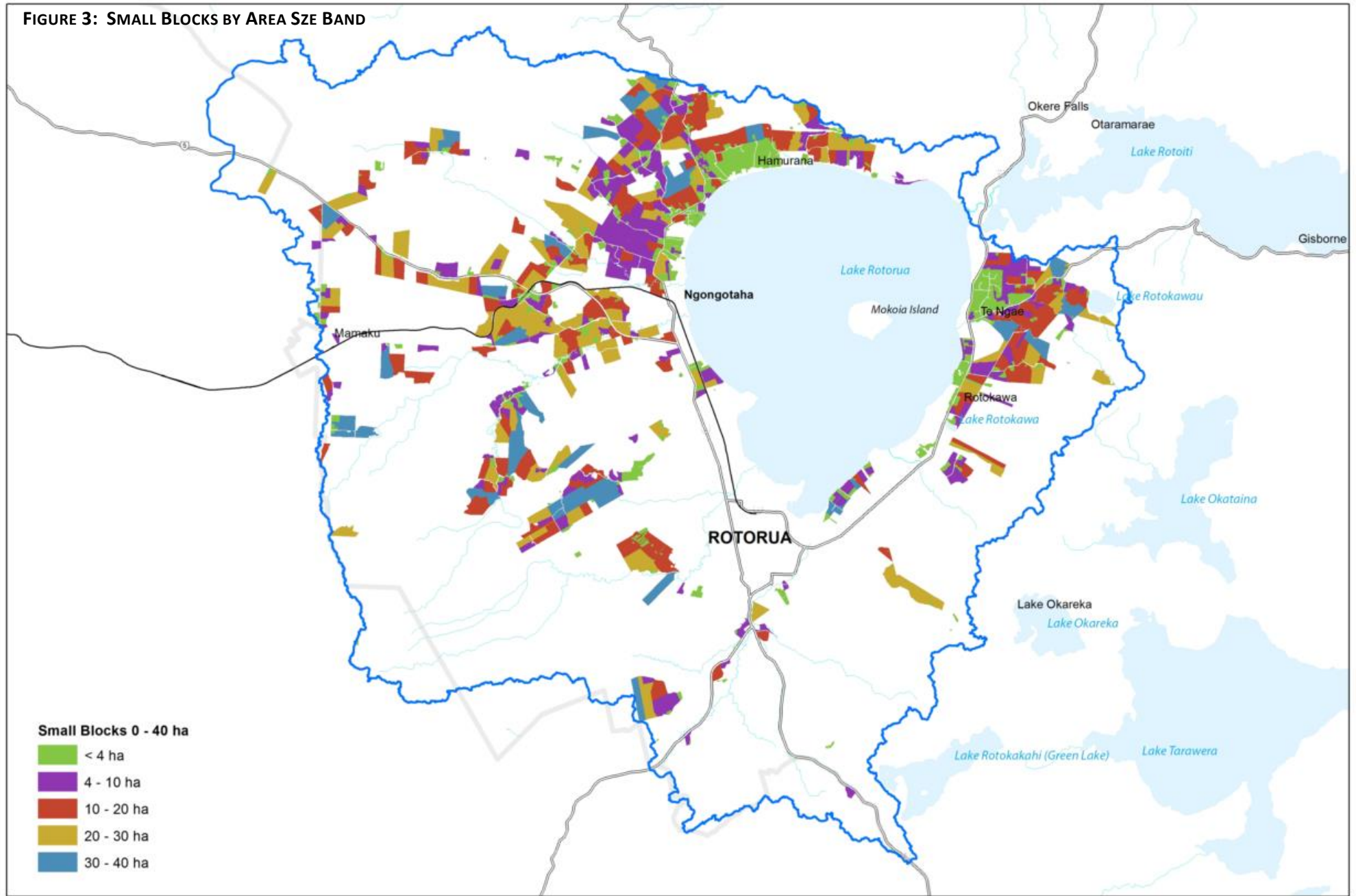


FIGURE 3: SMALL BLOCKS BY AREA SIZE BAND



Small Blocks within the Rotorua Groundwater Boundary

4 People Living On Small Blocks

4.1 Small Block Research Summary

There is limited information about people living on Small Blocks in the Lake Rotorua Catchment. Two small local studies were undertaken in 2014. Two larger (national and regional) studies provide more detailed insights where inferences could be applied to Small Block owners within the catchment. The findings from these four studies are summarised here. More detailed summaries of this research are presented in Appendix 2.

Types of Small Block Owners

A large scale national survey asked Small Block owners to choose from five descriptors:

- 40% indicated the term 'Lifestyler' as their preferred description.
- 20% identified as 'Small Farmers'
- 14% as 'Hobby Farmer'
- 12% as 'Horticulturalist/Grower'
- 'Farmer' was the least preferred description (6%).

In general, Lifestylers had smaller properties, had not been on their properties as long, and had less experience at farming than other Small Block owners.

Why do people live on Small Blocks?

In the two larger studies, general characteristics of 'country life' were valued as well as 'peace, quiet and tranquillity', space, privacy, openness, no close neighbours and clean air.

Conversely, 'Time required for work', 'transport to work and school', 'chores and/or property maintenance' and 'unexpected costs and/or problems with local authorities' were commonly held disadvantages. Small Block owners disliked the idea of close neighbours and felt that further subdivision would change the nature of their experience.

Income from Small Blocks

All four studies confirmed that the majority of Small Block owners were engaged in some form of production from the land, but generally this did not solely support their households.

Attitude and Awareness of Environmental Practice

The two local studies indicated that Small Block owners tend to have low awareness about nutrient discharges and land use changes that reduce nutrient loading. Low awareness was linked to not having access to information from agricultural organisations to the same degree as farmers on large holdings. Low awareness was also linked to Small Block owners not placing much importance on nutrient management.

The two larger studies identified that most Small Block owners intended to protect or encourage growth of native bush and many intended to plant trees for landscaping. However, they generally did not voluntarily engage in environmentally friendly practices and environmental monitoring to the same extent as seen in farmers and horticultural growers.

4.2 Number of People Living on Small Blocks

GIS data enables a quantitative analysis of people living on Small Blocks^{VR} in the catchment through an analysis of houses located on these rural properties. Table 1 summarises the number of houses for each area size band.

TABLE 1: HOUSES ON SMALL BLOCKS^{VR}

Area Size Band	Total Small Blocks	Reticulated House	Non-reticulated House	Total Small Block ^{VR} House	# Without House	% Without House	% Multiple houses
0.05 - 0.4 ha	214	112	53	165	54	25%	0.0%
0.4 - 2 ha	674	405	147	552	134	20%	0.4%
2 - 4 ha	157	35	100	135	40	25%	8.1%
4 - 10 ha	265	18	227	245	54	20%	11.0%
10 - 20 ha	102	16	71	87	28	27%	9.2%
20 - 30 ha	56	0	32	32	27	48%	9.4%
30 - 40 ha	16	1	9	10	6	38%	0.0%
Total	1,484	587	639	1,226	343	23%	4.2%

- There are a total of 1,226 houses in the Small Block sector.
- 77% of Small Blocks^{VR} have a house located on the property, with 4.2 % of these having multiple houses.
- Small Blocks^{VR} with multiple houses are more common in the 2-10 hectare area size band.
- Small Blocks^{VR} without a house are more common in the 20 - 40 area size bands.

Applying mean household size in the Rotorua District from the 2013 Census (2.6 people per household)² to the total number of houses in the Lake Rotorua Groundwater catchment (1,226) gives a crude estimate of how many people live on Small Blocks^{VR} within the catchment.

- An estimated 3,188 people or 5.7% of the total catchment population live on Small Blocks^{VR}, as summarised in Table 2 below.
- 70% of people (2,215) living on Small Blocks live on properties <4 ha.

Note: This methodology assumes that all houses/dwellings in the Small Block sector are occupied. According to the 2013 census, 9% of rural dwellings were unoccupied; however this percentage includes dwellings where residents were away temporarily on census night as well as empty dwellings.

TABLE 2: PEOPLE LIVING ON SMALL BLOCKS^{VR}

Area Size Band	Houses on Small Blocks ^{VR}	Estimated People Living on Small Blocks ^{VR}
0.05 - 0.4 ha	165	429
0.4 - 2 ha	552	1,435
2 - 4 ha	135	351
4 - 10 ha	245	637
10 - 20 ha	87	226
20 - 30 ha	32	83
30 - 40 ha	10	26
Total	1,226	3,188

² A total of 57,669 people were living in the Lake Rotorua Catchment in 2006. The Rotorua District population has remained almost static since this period (i.e. decline of less than 1% in the 2013 census.)

5 Tenure of Small Blocks

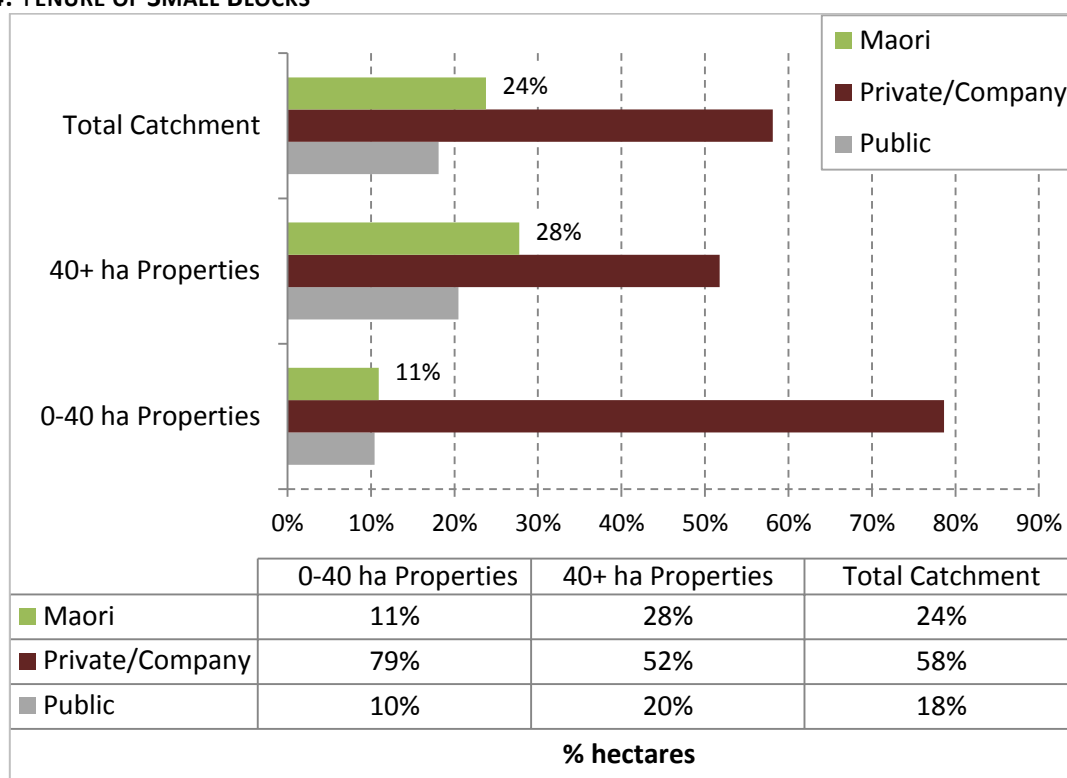
Due to the difficulty in matching Tenure to Valuation Data, the data in this section summarises tenure of all properties less than 40 hectares (including urban areas) within the Rule 11 boundary³.

Maori land makes up 11% of total Rule 11 Small Block^{VR} area. This is proportionally lower than Maori land in the total Rule 11 catchment (24%).

Comment:

- The large publicly owned share (18%) will now be much reduced due to Treaty settlements transferring ownership of the Whakarewarewa and Mamaku North forests to Iwi interests.
- It is not known from this data if any RLC / DOC / Crown land is in pasture (e.g. possibly leased to farmers) and subject to new rules.
- The data is represented as percentages in Figure 4 below because the actual area includes urban zoned land and is mapped to the Rule 11 boundary.

FIGURE 4: TENURE OF SMALL BLOCKS



³ Source: Compiled from Environment Bay of Plenty - Rotorua Property Size Table. Note: Maori ownership data was provided to BOPRC by Te Tumu Paeroa in 2010. The tenure data above is based on Rule 11. "Private" is all other general title land and may have a Maori owner but will not be multiple-owned Maori land.

6 Land Use in the Small Block Sector

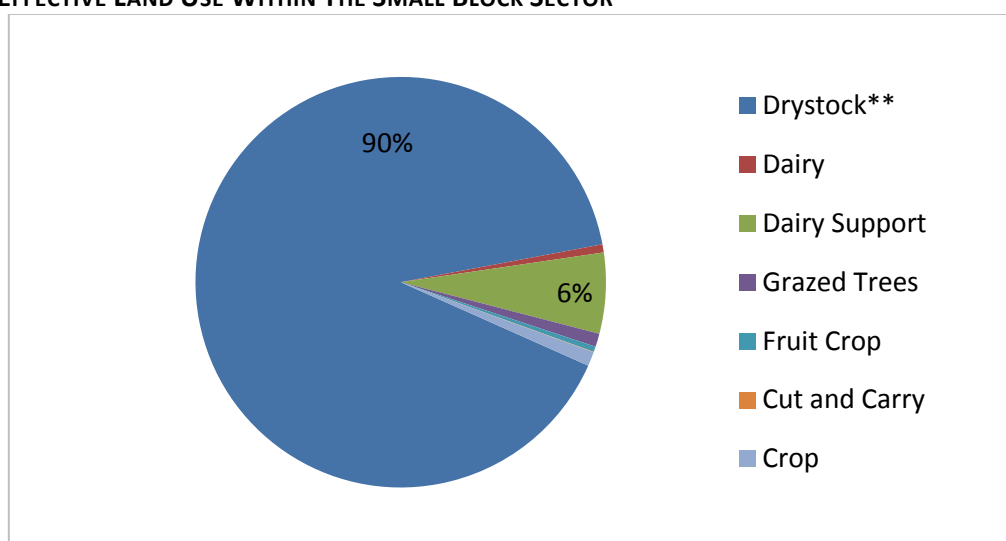
- Land use data is from BOPRC's GIS, including 2003 aerial photography and land uses recorded in 2001-2004 benchmarked files, consistent with the draft rules focus on 2001-2004 land use.
- The effective⁴ land area in the Small Block Sector^{VR} is 4,155 hectares which equates to 19% of the total 22,112 hectares effective land area in the catchment (inclusive of grazed trees).
- Drystock is the most common effective land use in the Small Block^{VR} sector (90%, 3,755ha) followed by Dairy Support (6%, 264 ha), as shown in Table 3 and Figure 5 below. Dairy Support will be under-represented because that land use is only assigned when a property has been benchmarked.

TABLE 3: LAND USE IN THE SMALL BLOCK^{VR} SECTOR

Land Use (ha)	<0.4ha	0.4 - 2ha	2 - 4ha	4 - 10ha	10 - 20ha	20 - 30ha	30 - 40ha	Total
Crop		1	4	18	8	16		47
Cut and Carry					2			2
Fruit Crop		1	1	15	0.5			17
Grazed trees				7	5	22	8	43
Dairy support	0.2	1	0.2	13	42	129	79	265
Dairy*		1		9	17			27
Drystock	8	358	307	1,074	1,038	680	290	3,755
Total Effective Area	9	361	312	1,136	1,112	848	377	4,155
Bush and scrub	6	71	62	209	183	193	95	818
Forestry	0.3	1	3	28	56	72	27	187
Wetland	1	9	17	36	1	9	1	73
Reticulated housing	19	141	12	7	3		0.2	182
Non-reticulated housing	8	39	30	66	21	9	2	175
Other non-productive	0.2	2	3	19	12	0.1	8	43
Grand Total	42	624	438	1,501	1,389	1,129	510	5,634

**This dairy non-benchmarked land is in the Waikato Region but within the groundwater catchment*

FIGURE 5: EFFECTIVE LAND USE WITHIN THE SMALL BLOCK SECTOR



***Drystock in this instance includes sheep, beef, deer and other drystock on grazed pasture and fodder crops.*

⁴Effective area is the part of the property that is actively grazed or cultivated.

7 Small Blocks as Business Units

In 2012 Statistics New Zealand conducted the 5-yearly Agricultural Production Census⁵. The Agricultural Production Census is sent to all GST registered farming businesses (not non-farming businesses that may be located in rural areas). Registration for GST is not compulsory for businesses with a turnover of less than \$60,000/year, although businesses can choose to register voluntarily.

- Very few Small Blocks^{VR} less than four hectares are registered for GST (2%), as shown in Table 4.
- GST registration is considerably higher in the 10-40 hectare range indicating that many owners within this area band may have more in common with commercial farmers than “lifestylers”.

TABLE 4: GST REGISTERED FARM BUSINESSES BY FARM TYPE AND LAND SIZE

Farm type	< 4ha	4 - 10 ha	10 - 20 ha	20 - 40 ha	Total
Dairy	0	3	0	0	3
Deer	0	0	3	0	3
Sheep and Beef	6	21	18	30	75
Other Livestock	6	6	3	0	15
Other Agricultural Activity	12	9	9	6	36
Total GST	24	33	39	36	132
Total Small Blocks	1,045	265	102	72	1,484
% GST Registered	2%	12%	38%	50%	9%

8 Small Block Land Valuation

Table 5 summarises the land value of Small Blocks^{VR} using data from the Rotorua District Valuation Roll (2014). The total land value of the Small Blocks^{VR} sector is just under \$389 million or 49% of the total value of rural land in the catchment (\$800 million).

TABLE 5: LAND VALUATION OF SMALL BLOCK^{VR} SECTOR

Area band ha	Number of Small Blocks ^{VR}	Total Area Small Blocks ^{VR} (ha)	Total Land Value (\$)	Average Land Value (\$)	Average \$ per hectare
0.05 - 0.4 ha	214	42	\$ 21,722,200	\$ 101,506	\$517,195
0.4 - 2 ha	674	624	\$ 141,341,700	\$ 209,706	\$226,509
2 - 4 ha	157	438	\$ 44,711,000	\$ 284,783	\$102,080
4 - 10 ha	265	1,501	\$ 94,321,100	\$ 355,929	\$62,839
10 - 20 ha	102	1,389	\$ 50,595,000	\$ 496,029	\$36,425
20 - 30 ha	56	1,129	\$ 26,549,000	\$ 474,089	\$23,516
30 - 40 ha	16	510	\$ 9,658,000	\$ 603,625	\$18,937
Total	1,484	5,634	\$ 388,898,000	\$ 262,061	\$69,027

⁵ Note: The Agricultural Production Census has an 88% response rate. Non-responses from GST registered farm businesses are imputed. Any number that is not a multiple of 3 may be rounded up or down to the nearest multiple to ensure respondent confidentiality.

9 Nitrogen Loss from the Small Block Sector

9.1 Benchmarked Small Blocks

A property's Rule 11 nutrient limit, or 'benchmark' is set using information on how the land was used during the period of 1 July 2001 to 30 June 2004. This information is entered into OVERSEER® – a farm nutrient budgeting model. This generates an annual average nutrient allowance of nitrogen and phosphorus. "Small Blocks" in this section of the report refer to benchmarked properties (not Val Refs). Some of these benchmarked properties will comprise multiple Valuation References.

While it is noted that area thresholds in the draft rules are based on a property's effective area, this section of the report bands properties by total area, consistent with the balance of the report. However, the nitrogen loss analysis focuses on the effective area of these Small Block because the rules do not require (or envisage) changes in N loss on non-effective land (bush, house blocks etc).

A total of 58 Small Blocks have been benchmarked, covering 1016 total hectares and 855 effective hectares. The latter is 21% of the total Small Block effective area of 4,085 hectares (excluding grazed trees and 27 ha of non-benchmarked dairy land⁶). Estimates of total Small Block N loss and potential 2032 NDA reductions were extrapolated from this 21%. The 58 benchmarked Small Blocks include a number of dairy support properties but do not include any support blocks that are part of benchmarked dairy farms.

All provisional NDAs (pNDA) have been taken from total and effective area data provided by BOPRC, which is the same dataset used to support the N allocation system described in Schedule One of the [Draft Rules](#) (27 August 2015 version). In short, the drystock N allocation formula gives a pNDA that is 20% less than the property's benchmark, provided the pNDA falls between 18-54.6 kgN/ha/yr. The overall impact of this allocation formula is to reduce drystock sector N losses by 17.2%, in accordance with the "[Integrated Framework](#)". All N loss figures are based on OVERSEER® Version 6.2.0.

TABLE 6: BENCHMARKED PROPERTIES WITH TOTAL AREA <40 HECTARES

Area Band	Count	Total area	Effective Area	BM Effective Area	pNDA Effective Area	Reduction from BM	Avg BM	Avg pNDA	Reduction from BM: kgN/ha/y, %	
0.05-2ha	2	2	1	24	26	-2	16.8	18.0	-1.2	-7.1%
2-4 ha	2	8	7	131	128	4	18.5	18.0	0.5	2.8%
4-10 ha	12	79	71	1,646	1,470	177	23.1	20.7	2.5	10.7%
10-20 ha	19	279	241	6,797	5,960	837	28.2	24.7	3.5	12.3%
20-30 ha	15	362	280	7,546	6,496	1,050	26.9	23.2	3.7	13.9%
30-40 ha	8	286	254	8,849	7,254	1,594	34.9	28.6	6.3	18.0%
Total	58	1,016	855	24,993	21,333	3,660	29.2	25.0	4.3	14.6%

Table 6 shows the key parameters for the 58 benchmarked Small Blocks, stratified by total area bands. While the count of properties within each area band is small, (especially in the two smallest bands), there appears to be a consistently increasing N reduction trend with increasing area band. The overall

⁶ Grazed trees are excluded from this nitrogen analysis because their block pNDA equals their N benchmark i.e. there is no change. The 27 ha of dairy is excluded because these blocks are part of larger dairy farms from the non-benchmarked additional groundwater catchment near Mamaku.

benchmarked Small Block N reduction of 14.6% is less than the drystock sector average of 17.2% due to the lower-than-average reductions required in all area bands except the 30-40 ha band.

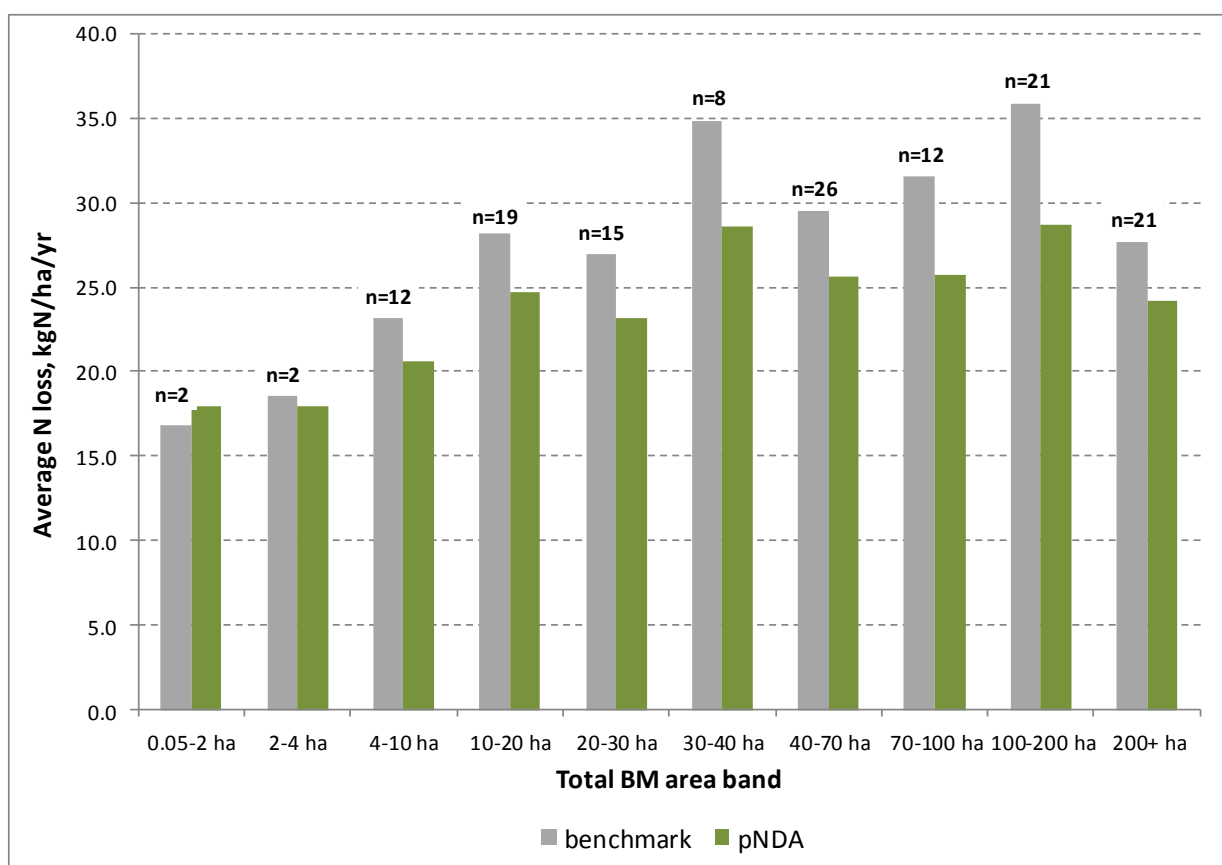
This lower aggregate N reduction is consistent with a number of <40 ha farms being at or close to the 18 kgN/ha/yr lower limit for drystock pNDAs. Benchmarked farms in this “zone” face small or no N reductions, with those below 18 kgN/ha/yr being able to increase to that level. The net effect is to lower the overall average reduction to meet pNDA levels for 0-40 ha farms

The data in Table 6 is used to derive potential N loss scenarios in Section 9.3.

9.2 Benchmarked Drystock Farms and pNDA

There are 138 benchmarked drystock farms of all sizes and these are shown in Figure 6 below as average benchmarks for each total area band, beside their corresponding pNDAs and the count for each band. Both benchmarks and pNDAs are for the effective area portion of the farm. The Figure 6 results for <40 ha farms are the same as the corresponding data in Table 6 above.

FIGURE 6: DRYSTOCK FARMS: BENCHMARKS AND PNDA, OVERSEER 6.2.0



Comment on Figure 6:

- The small number of properties in some size bands, notably two each in 0.05-2 ha and 2-4 ha, means benchmark and associated pNDA values must be treated with caution.
- While 21% of the small block sector’s effective area has been benchmarked and this could approximate a representative sample of all small blocks <40 ha, there is much less certainty on the representativeness of the six area bands that span 0.05-40 ha.

- A further complication is that eight benchmarked properties comprise multiple Valuation References which, if assessed individually, would tend to increase the count in the smaller area bands. However, this would have little impact on the nitrogen loss which is driven by effective area.
- The benchmark period of 2001-2004 is now 11-14 years ago and it is not known what current N losses are. However, Rule 11 benchmarked data (and its analysis in this review) remains relevant because the draft allocation system relies on Rule 11 data.
- The N benchmarks (and hence pNDAs) on farms <10ha are lower than the N benchmarks on farms >10ha. However, there is no consistent trend in N benchmarks for drystock farms >10 ha.

9.3 Extrapolation of Small Block Benchmarks and pNDAs to the whole Small Block sector

The 58 benchmarked drystock farms <40 ha provide a credible basis to extrapolate N losses, and potential N reductions, to the whole Small Block sector. In the context of this report, this means applying the benchmark and pNDA information in Table 6 to the overall Small Block sector described in Section 6. This extrapolation is done as a series of four scenarios, defined as follows:

- **Scenario 1:** Simple pro-rata application (by area-band) of “per hectare” benchmarked N loss and pNDA across the whole Small Block sector
- **Scenario 2:** The same as Scenario 1, except that all farms <10 ha are assumed to be permitted activities with an N loss of 18 kgN/ha/yr
- **Scenario 3:** Small Blocks that are already benchmarked get the corresponding pNDA (i.e. pNDA values in Table 6); while all other Small Blocks apply for resource consent and get the default derived benchmark and associated pNDA of 24.7 kgN/ha/yr.
- **Scenario 4:** 50% of each area band becomes permitted at 18 kgN/ha/yr, while the remaining 50% apply for resource consent and get the default derived benchmark and associated pNDA of 24.7 kgN/ha/yr.

There are an infinite number of Small Block scenarios and there will be wide variation within each area band. This analysis uses averages and extrapolation to describe a credible spectrum of aggregate outcomes for Small Blocks based on the August 2015 draft rules. Scenarios 1-4 are summarised in Table 7 below.

TABLE 7: BENCHMARKED <40HA (EFFECTIVE) FARMS – AGGREGATE BENCHMARKS AND PROVISIONAL NDAs

			Scenario 1		Scenario 2		Scenario 3		Scenario 4		
			Pro-rated from actual BM/pNDA		Pro-rated from actual BM/pNDA except all <10ha @ 18 kgN/ha/y		BM land gets actual pNDA; non-BM'd land gets pNDA @ 24.7 kgN/ha/y		50% area @ 18 kgN/ha/y; 50% area gets pNDA @ 24.7 kgN/ha/y		
Area band	Effective area ha	Status Quo N loss	All units except area are kgN/ha/y								
			sum pNDA	Reduction from Status Quo	sum pNDA and 18kgN	Reduction from Status Quo	sum pNDA	Reduction from Status Quo	sum pNDA and 18kgN	Reduction from Status Quo	
0.05-2 ha	369	6,195	6,637	-441	6,637	-441	9,097	-2,902	7,872	-1,677	
2-4 ha	312	5,778	5,614	164	5,614	164	7,657	-1,878	6,659	-881	
4-10 ha	1,120	25,925	23,141	2,784	20,165	5,760	27,383	-1,458	23,918	2,007	
10-20 ha	1,090	30,758	26,972	3,786	26,972	3,786	26,935	3,823	23,273	7,485	
20-30 ha	826	22,229	19,136	3,092	19,136	3,092	19,967	2,262	17,627	4,601	
30-40 ha	369	12,850	10,535	2,315	10,535	2,315	10,089	2,761	7,870	4,980	
Total	4,085	103,735	92,035	11,700	89,059	14,676	101,128	2,607	87,219	16,516	
				11.3%			14.1%			2.5%	15.9%

The “Status Quo” N loss in Table 7 is obtained by extrapolating the 58 benchmarked Small Block N losses to the total 4,085ha of effective area in the Small Block sector (excluding grazed trees for this analysis). This provides a basis from which to derive N loss reductions. Comment on each scenario is given below:

Comment on Scenario 1: Benchmarked N loss and pNDA pro-rated across the whole Small Block sector

- The aggregate reduction of 11.3% is less than the 14.4% reduction in the benchmarked-only data (Table 6) due to different area band distributions between the benchmarked “sample” and the full <40 ha dataset.
- It is doubtful that non-benchmarked properties that had below average N losses in the benchmark period would be either willing or able to produce documentation to support a calculated pNDA. This is especially so when the default pNDA of 24.7 kgN/ha/yr is available under the draft Schedule One allocation system.

Comment on Scenario 2: Similar to Scenario 1 except farms <10 ha are permitted @ 18 kgN/ha/yr

- Only 17 farms <10 ha have been benchmarked and these have average benchmarks close to the permitted threshold of 18 kgN/ha/yr. It is plausible that a large proportion of <10 ha farms could pursue permitted activity status by either meeting the stocking rate table, or by submitting annual OVERSEER® files showing compliance with the limit.
- The consequence is that aggregate N reductions increase to 14.1%, relative to 11.3% in Scenario 1.
- While not all properties under 10 ha would be willing or able to meet the 18 kgN/ha/yr limit, the flip-side is there are likely to be some 10-40 ha properties that will meet the permitted limit. It is not possible to estimate how landowners will respond but it seems likely that many will choose to avoid the resource consent process and its associated costs, particularly smaller properties.

Comment on Scenario 3: Benchmarked land gets actual pNDA; other land gets pNDA @ 24.7 kgN/ha/y

- This assumes all non-benchmarked Small Blocks apply for and receive the default derived pNDA of 24.7 kgN/ha/yr i.e. none opt for permitted activity status at 18 kgN/ha/yr.
- Although it is unlikely that none of these non-benchmarked Small Blocks opt for permitted activity status, Scenario 3 illustrates the upper limit of potential N allocation for <40ha properties under such an assumption.
- The aggregate result is small decrease of 2.6 tN/yr or 2.5% relative to status quo N loss. While this scenario may appear unlikely, it represents the minimum potential Small Block N reduction under the draft N allocation scheme.

Comment on Scenario 4: 50% permitted @ 18 kgN/ha/yr, 50% gets pNDA @ 24.7 kgN/ha/y

- This scenario ignores that 21% of Small Blocks (measured by effective area) already have a benchmark with a range of associated pNDAs. However, many of these pNDAs are relatively low and some may opt for permitted status.
- The aggregate result is a decreased N loss of 15.9% relative to the assumed status quo levels, equivalent to a reduced aggregate N leaching loss of 16.5 tN/yr.
- Of the four table scenarios considered, Scenario 4 gives the largest aggregate N loss reduction across the Small Block sector. However, this N loss is not substantially greater than the aggregate losses in Scenarios 1 and 2, especially considering the extrapolation assumptions required to generate these aggregate figures.

General comment on Estimated Small Block N reductions

All of the above scenarios may underestimate Small Block N reductions because landowners seeking to comply with the permitted threshold of 18 kgN/ha/yr may stock their land conservatively in order to be compliant. This particularly applies to those using the permitted stocking rate table which regulates peak

stocking rates i.e. winter and average stocking rates will generally be lower than peak spring stocking rates, with consequently lower annual N losses.

9.4 Comparison of under 40 hectare nitrogen losses with over 40 hectare properties

The overall contribution of the <40 hectare Small Block sector to nitrogen reductions will vary, depending on the choices Small Block owners considerably, as shown by the wide range of aggregate N reductions in the preceding section. To help place those potential N reductions in context, it is useful to compare with the >40 hectare land. Table 8 below illustrates this by describing all pastoral land N allocation within three categories:

- **Small block drystock farms <40ha** as defined in this report, and using Scenario 1 (Table 7) for assumed Small Block reductions
- **Drystock farms >40 ha:** This is based on total drystock land minus the <40 ha small blocks as defined in this report. This approach ensures that the total sum of drystock land is consistent with BOPRC’s benchmark and pNDA database. However, this means that small amount of <40 ha land is included where that was filtered out of the <40 ha Small Block analysis e.g. slithers <0.05ha; small blocks straddling the catchment boundary with less than 50% inside the catchment.
- **Dairy farms,** which are all benchmarked dairy farms plus extrapolation (within BOPRC’s database) to non-benchmarked dairy land (~300 ha of Mamaku additional groundwater land).

TABLE 8: COMPARISON OF <40 HA DRYSTOCK, >40 HA DRYSTOCK AND DAIRY BENCHMARKS AND PROVISIONAL NDAs

Land use (area band)	Effective area ha	Assumed BM sum kgN/y	Assumed pNDA kgN/y	Reduction from BM kgN/y	Reduction from BM %	Average BM kgN/ha/y	Average pNDA kgN/ha/y	% of total pastoral reduction
Drystock 0.05-40 ha	4,085	103,735	92,035	11,700	11.3%	25.4	22.5	4.4%
Drystock 40+ ha	12,181	398,898	324,145	74,753	18.7%	32.7	26.6	28.3%
Dairy ha	5,016	502,633	325,203	177,429	35.3%	100.2	64.8	67.2%
Total	21,282	1,005,265	741,383	263,882	26.3%	47.2	34.8	100.0%

Table 8 indicates the relative assumed benchmarks or status quo starting points for three “sectors” that comprise pastoral land in the Lake Rotorua catchment. The following comments are made:

- The total dairy and drystock sector BM (= benchmark sum) and assumed pNDA reductions are taken from the Regional Council’s provisional NDA calculations which in turn are based on the “Integrated Framework”.
- The Small Block “Scenario 1” reduction of 11.7 tN/yr reduction is 4.4% of the total 264 tN/yr reduction envisaged from the pastoral sector under the draft rules. The Small Block contribution to total pastoral N reductions would rise to 5.5% under Scenarios 2 and 6.1% under Scenario 4.
- The estimate Small Block N reduction of 11.7 tN/yr represents 13% of the total drystock sector reduction of 86 tN/yr. The area weighted drystock average N reduction for <40 ha farms (11.1%) and over 40 ha farms (18.8%) equals the Integrated Framework target of 17.2%.
- The relatively modest 4.4-6.1% Small Block estimated share of total pastoral N reduction is due to:
 - Assumed low Small Block benchmarks or N starting points, particularly with some at or close to the permitted threshold of 18 kgN/ha/yr, resulting in lower reductions than the drystock sector average reduction of 17.2%
 - The total size of the Small Block Sector

- No comment on the relative fairness of the incumbent draft N allocation scheme, nor any alternative allocation scheme.

9.5 Examples of Small Blocks, Associated Nitrogen Losses and Provisional NDAs

To help illustrate the diversity of Small Blocks and their associated nitrogen losses, a selection of benchmarked properties is given below. Please note that:

- The sample is not representative. It simply covers a range of sizes and land uses for illustrative purposes.
- Apart from the property's area band, all data in each table relate to the effective area only (i.e. tree blocks, house and non-productive areas are ignored).
- As these examples are actual properties, the property's total area have been generalised into area bands to preserve anonymity.
- The provisional NDA values and commentary are based on the draft rules as at August 2015.
- All N loss levels and provisional NDAs use version 6.2.0 of OVERSEER.

Of the 4,085 ha of effective area (pasture + cultivated), about 21% was benchmarked at their 2001-2004 nutrient loss level. The calculation of provisional NDAs (as noted in each example below) for the benchmarked properties follows the [draft rules](#) allocation in Schedule One. The draft rules and Schedule One also apply to non-benchmarked land.

The options for non-benchmarked properties under 40 ha are:

1. If the effective area is under 10 ha, they may meet the permitted stocking rate table (Schedule Four), which equates to approximately **18 kgN/ha/yr**. The quoted stocking rates apply at any time i.e. they act as a maximum stocking rate, not an annual average.

OR

2. Provide an annual OVERSEER® file which meets 18 kgN/ha/yr in Version 6.2.0 (this equates to 68% of the drystock reference file – see [Schedule Five](#) for details on the reference file methodology). This could enable a variable stocking rate that exceeds the Schedule Four stocking rate table for part of the year, but is still able to comply with the **18 kgN/ha/yr** limit on an annual basis.

OR

3. Apply for resource consent and get a derived drystock sector average benchmark of 30.9 kgN/ha/yr. The allocation methodology reduces this by 20% to give provisional NDA **24.7 kgN/ha/yr**. There is potential scope for higher (or lower) benchmarks to be derived, from which higher (or lower) NDAs could be calculated – this is covered under the “exceptional circumstances” clause in Schedule One of the draft rules.

The following examples only focus on the 2032 provisional NDA and/or permitted levels. Other elements of the draft rules (e.g. information and consent requirements, Nitrogen Management Plans and Managed Reduction Targets) are not addressed.

A Dairy Support	Total area: 30-40 ha Effective area: ~37 ha	
Stock	190 weaners Dec-June	90-100 dairy grazers year-round
Benchmark	63 kgN/ha/yr	
Provisional NDA	63 less 20% = 50.4 kgN/ha/yr	
Comment	This property is a relatively intensive operation with an NDA close to the upper drystock limit of 54.6 kgN/ha/yr. A resource consent and NMP would be required from 2022	

B Mixed sheep & beef	Total area: 5-10 ha Effective area: ~6 ha	
Stock	28 sheep	5-6 cattle
Benchmark	13 kgN/ha/yr	
Provisional NDA	13 less 20% = 10.4 kgN/ha/yr but this is below the 18-54.6 range, therefore pNDA = 18 kgN/ha/yr	
Comment	This property would also be permitted under the (draft) stocking rate table.	

C Mixed sheep & beef	Total area: 20-30 ha Effective area: ~19 ha		
Stock	147 sheep (winter rate, mixed age)	27 steers (winter numbers)	0.6 ha fodder crop
Benchmark	37 kgN/ha/yr		
Provisional NDA	37 less 20% = 29.6 kgN/ha/yr		
Comment	The winter crop N loss comprises 46% of total benchmarked losses. There may be scope to meet the pNDA if the fodder crop was substituted with imported low-N feed. A resource consent and NMP would be required from 2022.		

D Mixed deer & sheep	Total area: >40 ha Effective area: ~35 ha		
Stock	290 deer (winter rate, total varies with trading)	16 sheep + lambs	2.5 ha fodder crop
Benchmark	32 kgN/ha/yr		
Provisional NDA	32 less 20% = 25.6 kgN/ha/yr		
Comment	The crop N loss comprises 17% of benchmarked losses. A resource consent and NMP would be required from 2022.		

E Horses, sheep & beef	Total area: 5-10 ha Effective area: ~7 ha		
Stock	13 ponies (in light work)	7 sheep (average, numbers vary)	5 heifers/cows, 2 in autumn
Benchmark	24 kgN/ha/yr		
Provisional NDA	24 less 20% = 19.2 kgN/ha/yr		
Comment	The provisional NDA is less than the “derived level” for non-benchmarked drystock land of 24.7 kgN/ha/yr. A resource consent and NMP would be required from 2022.		

F Mixed deer & sheep	Total area: 2-5 ha Effective area: ~4 ha	
Stock	18 sheep	Equivalent of 18 RSU e.g. 3 bulls
Benchmark	19.4 kgN/ha/yr	
Provisional NDA	19.4 less 20% = 15.5 kgN/ha/yr, but this is below the 18-54.6 range, therefore pNDA = 18 kgN/ha/yr	
Comment	This property meets the permitted stocking rate table when using the benchmarked stock numbers, despite its actual benchmark being slightly above 18 kgN/ha/yr. One factor explaining this is the property’s higher rainfall, compared with what was effectively an average rainfall used to derive the stocking rate table values.	

G Sheep, beef & horse	Total area: 20-30 ha Effective area: ~19 ha		
Stock	97 sheep (mixed age)	15 bulls	2 horses
Benchmark	16.1 kgN/ha/yr		
Provisional NDA	16.1 less 20% = 12.8 kgN/ha/yr, but this is below the 18-54.6 range, therefore pNDA = 18 kgN/ha/yr		
Comment	This property meets the permitted stocking rate table when using the benchmarked stock numbers but is over 10 ha and therefore would need to provide an annual OVERSEER file to be a permitted activity.		

Appendix 1:

Data Definitions and Datasets Used in this Review

- Valuation References in the Rotorua District Valuation roll were matched to parcels in the GIS Lake Rotorua Catchment Boundary.
- 'Rural 'has been assigned to Small Blocks^{VR} using the Notified 2014 Rotorua Lakes Council Rural planning zone. Rural 3 (Mamaku Village) was excluded from the analysis (see Map below).
- Valuation References (<40 ha) that straddled the catchment were included if at least 50% of that land was in the inside the catchment.

A simple, unfiltered count indicates that there are 1,724 Small Blocks^{VR} in the Lake Rotorua Groundwater Catchment. However many of these Small Blocks^{VR} are linked to larger benchmarked farms (> 40 hectares) which are often comprised of multiple titles and Valuation References. For this review, the Valuation References (<40ha) associated with benchmarked farms (>40ha) have been removed to give a clearer indication of the Small Block^{VR} sector.

Data sources used in this analysis

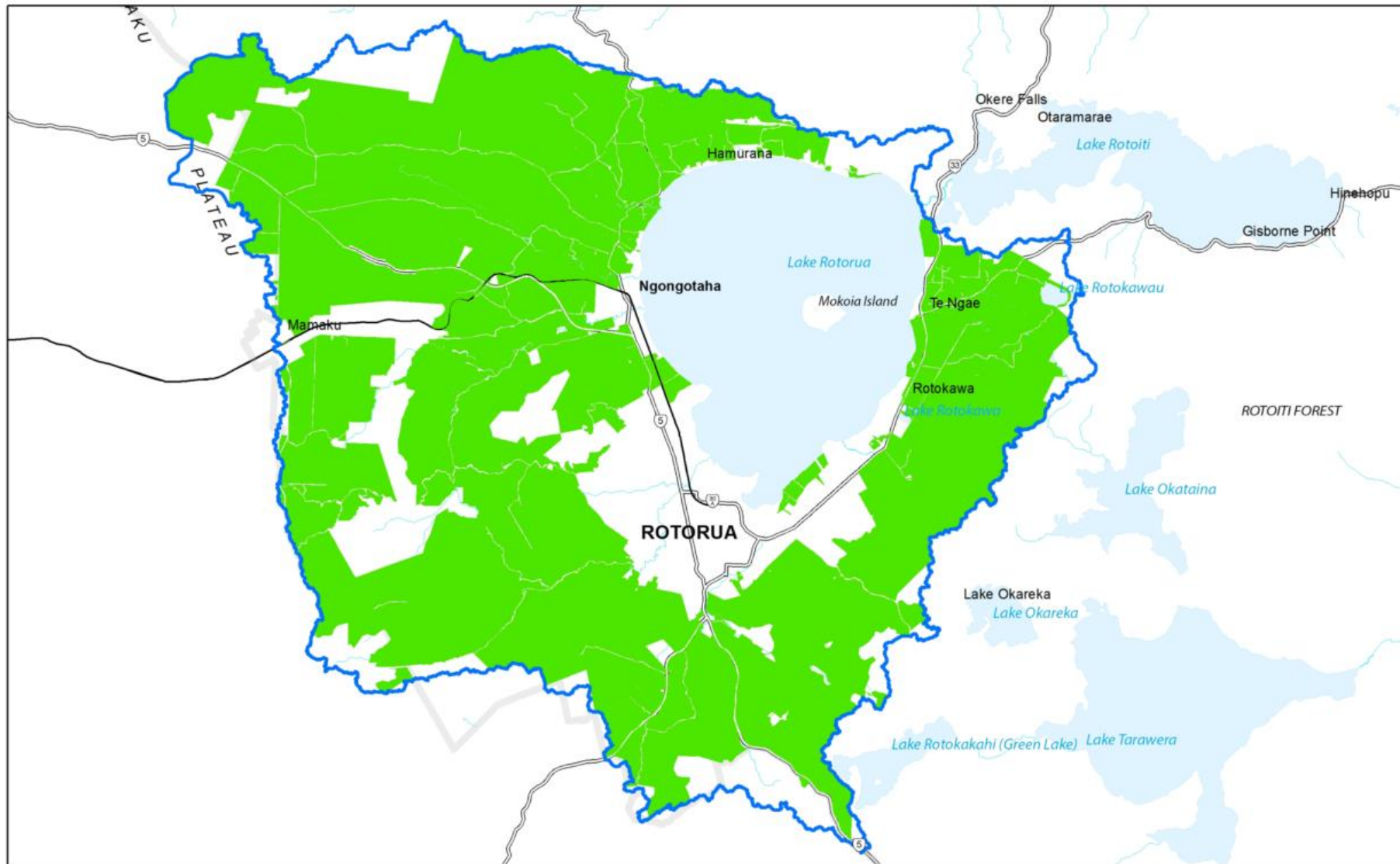
The two datasets used in this analysis are:

1. A11 SmallBlockAnalysis_Final_20151029.xls
2. Agricultural Census Final 2015 09 BoP farm type by land size(final.xls) - (Statistics NZ GST data)

FIGURE 7: MAP OF THE LAKE ROTORUA GROUNDWATER BOUNDARY



FIGURE 8: ZONING MAP - RURAL AREAS USED IN SMALL BLOCK ANALYSIS



Rural Area within the Rotorua Groundwater Boundary

Appendix 2:

NZ Research on Small Blocks

Limited research has been conducted in New Zealand on the behaviours and characteristics of people living on Small Block properties.

There have been two recent studies that focus on Small Block owners within the Lake Rotorua catchment. A larger national and regional study provides more detailed insights, where inferences may be applied to the landowners within the catchment.

Key findings from each of these four studies are summarised below

National Research

Title:	A Study Of Smallholdings And Their Owners (0.4 - <30 ha) in New Zealand
Year:	2004
Author:	Prepared for MAF by Cook, A. & Fairweather, J. R, Lincoln University
Methodology:	A nationwide postal survey of small holdings (0.4 to 30 ha), 947 respondents

KEY FINDINGS:

Profile

- Mean Property Size 8.5ha
- 65.6 per cent indicated they had previous farm experience
- Average Length of stay, 12 years
- Previous farm experience, 71%

Descriptors of People Living on Small Blocks

Respondents were asked choose from five descriptors:

- 40% indicated the term 'Lifestyler' as their preferred description.
- 20% identified as 'Small Farmers'
- 14% as 'Hobby Farmer'
- 12% as 'Horticulturalist/Grower' also preferred by some respondents (12.1 percent).
- 'Farmer' was the least preferred description (6% cent).

Income:

- 66% of small holdings were engaged in some form of production from the land, but generally this did not solely support their households.
- Around one-third (34%) indicated that their GST registration pertained solely to income from their smallholding.
- On-farm revenue varied greatly: 57% of small holdings reported no income and 8% reported income over \$20,000 – the latter were horticultural units or intensive livestock units.
- 87% of Small Block owners reported off-farm income. Paid employment was important with many small holders in full-time or part-time employment.
- Small block owners undertook approximately 15 hours of unpaid work on their properties per week.

Attitude and Awareness of Environmental Practice:

- Most Small Block owners intended to protect or encourage growth of native bush and many intended to plant trees for landscaping or commercial purposes.
- However, the small holders did not voluntarily engage in environmentally friendly practices and environmental monitoring to the same extent as seen in farmers and horticultural growers.

Values:

- Most smallholders value the merits of country life, including peace and quiet and clean air, and are involved in country life through association with rural organisations.
- 40% described themselves as lifestylers. In general, lifestylers had smaller properties, had not been on their properties as long, and had less experience at farming than other smallholders.

Regional Research

Title: Lake Rotorua Catchment Stakeholder Survey – Perceptions of Small Holdings and their Owners (FINAL DRAFT)

Year: 2013

Author: Prepared for Bay of Plenty Regional Council by APR Research

Methodology: Postal survey to Small Block stakeholders (0-40ha), 39 respondents

Of the 39 respondents, only two were Small Block owners, with the remaining stakeholders representing:

- Local government staff members who work with land owners;
- Agricultural representatives and consultants;
- Environmental stakeholders;
- Māori stakeholders; and
- Rural valuers, planners and real estate agents;

KEY FINDINGS:

Income:

- Agricultural stakeholders mostly responded that revenue was of low importance to small holders, while Māori stakeholders mostly responded that it was more important. Local government and environmental stakeholders tended to comment that revenue from small holdings was variable.

Attitude and Awareness of Environmental Practice:

- Many stakeholders indicated that small holders tend to have low awareness about nutrient discharges and land use changes that reduce nutrient loading, with many comments that awareness is variable.
- Low awareness was linked to small holders not having access to information from agricultural organisations to the same degree as farmers on large holdings. Low awareness was also linked to small holders not placing much importance on nutrient management.
- Compared with other stakeholders, Maori stakeholders tended to respond that small holders have greater awareness of the issues and place more importance on nutrient management.
- Many stakeholders indicated that small holders would probably be reluctant to consider land use change and that their views are influenced by a lack of awareness of the issues and less pressure to comply with regulations compared with owners of larger holdings.
- There were comments that awareness of the issues is increasing due to publicity and education and some stakeholders spoke of the need for small holders to have more education about the issues, including land use change.

Title:	Smallholdings in the Selwyn District
Year:	2005
Author:	Cook, A. & Fairweather, J. R, Lincoln University
Methodology:	Postal survey to Small Block stakeholders, (0-40ha), 492 respondents

KEY FINDINGS:

Profile:

- Mean Property Size 7.4 ha
- 65.6 per cent indicated they had previous farm experience
- Average length of stay, 12 years

Income:

- 69% had some level of income from land use, however much of this income was not substantial with 85% per cent of those with farm income reporting income less than \$20,000 per annum.
- More than half were employed off-farm with most in full-time work.

Attitude and Awareness of Environmental Practice:

- As a community objective it was important for smallholders to have enough clean water in lakes, streams or rivers to support living things.

Values:

- Smallholders tended to be satisfied with their smallholding lifestyle. Lifestyle in conjunction with land use and solely lifestyle were the most common reasons for smallholding. Few valued smallholding simply for land use.
- Respondents showed ready identification with the land in terms of it being like an artist's canvas with importance placed on creating a pleasant living environment by planting trees, shrubs or flowers. Most smallholders see their land in gardening rather than productive terms.
- General characteristics of country life were valued including rural or country living as well as peace, quiet and tranquillity, space, privacy, openness, no close neighbours and clean air.
- Time required for work, chores and/or property maintenance and unexpected costs and/or problems with local authorities were commonly held disadvantages.
- Smallholders dislike the idea of close neighbours and believe that further subdivision would change the nature of their smallholding experience.

Title:	Collaborative land use for economic and environmental gain in the Lake Rotorua catchment: Focussed option analysis for Small Block holders
Year:	2014
Author:	Stephanie Fraser for GROW Rotorua and the Bay of Plenty Regional Council, in partial fulfilment of the requirements of the course industry project for the Graduate Diploma in Resource Management at Waiariki Institute of Technology
Methodology:	Postal and telephone survey to Small Block owners, (0-40ha), 16 respondents from the Te Puea Road area.

KEY FINDINGS:

Profile:

- Respondents' land use: horticulture (9.7%), horses (9.5%), deer (16.8%), sheep/beef (60%) and workshop (4%)

Income:

- 38% of respondents reported they sent produce to market.

Attitude and Awareness of Environmental Practice:

- 38% considered they understood the new draft rules for NDA. Some considered the rules were unfair. 12% considered the rules would have a positive impact on the land use options for their properties.
- The lack of information about nitrogen leaching from alternative land use activities was raised as a concern (i.e. growing feijoas, hazelnuts)
- Recommendations included the development of nitrogen discharge information for a wider range of land uses and the creation of a Small Block holder resource kit.

Economic Collaboration:

- Economic collaboration occurs at a fairly low level. Three interviewees reported sharing costs for activities such as access to bores and haymaking. Three quarters of the interviewees did not collaborate with their neighbours for any economic activities. Barriers to collaboration were property size, diversity in enterprises and privacy.

Research References

APR Consultants Limited (2013) Review of small holdings in the Lake Rotorua catchment. Final draft of stage one scoping report. Report prepared for the Bay of Plenty Regional Council. Objective ref A1691134.

Cook, A. & Fairweather, J. R. (2005). Characteristics of Smallholdings in New Zealand: Results from a Nationwide Survey. AERU Research Report No. 220, Lincoln University.

Fraser, S (2014). Collaborative land use for economic and environmental gain in Lake Rotorua Catchment: focussed option analysis for small block holders. Report prepared for GROW Rotorua and Bay of Plenty Regional Council. Objective ref A2011512.

Sanson R, Cook A, Fairweather J (2004). A study of smallholdings and their owners. Wellington, New Zealand, MAF Policy