

## CONSIDERING SMALL BLOCKS IN CATCHMENT NITROGEN ALLOCATION

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### Abstract

Large reductions in nitrogen (N) losses from rural land are needed to meet Lake Rotorua's sustainable N load target of 435 tonnes by 2032. New rules have been developed which allocate N to all rural properties in the catchment, in addition to establishing an incentives scheme and engineering actions to achieve the N target.

There are almost 1500 small rural blocks under 40 ha in the Lake Rotorua catchment and about 160 rural properties over 40 ha. Conversely, the aggregate N contribution to the lake from small blocks is about 10% of that from large farms due to smaller aggregate area and generally smaller per hectare losses (except for septic tank "point source" N losses). The small block sector is a diverse group of landowners, from lifestylers seeking a quiet rural experience on the outskirts of Rotorua city, to commercially-focused drystock grazing farms.

There has been considerable political debate on the fairness and effectiveness of the new N rules, especially for small block owners in the Lake Rotorua catchment. This paper describes catchment small blocks (0-40 ha) in terms of area, land use, valuation and economic activity.

The new rules will generally require reductions in N loss rates relative to losses that occurred between 2001 and 2004. While 2001-2004 OVERSEER-based "Rule 11" assessments were completed for almost all properties over 40 ha, relatively few properties under 40 ha were assessed. While not necessarily representative, this small block Rule 11 dataset enabled qualified predictions to be made of the potential N reductions expected from small blocks under the new rules. This analysis recently informed policy discussion on pragmatic permitted activity thresholds for small blocks in the Lake Rotorua catchment.

### Introduction

Bay of Plenty Regional Council (BOPRC) has set a sustainable annual nitrogen (N) load target for Lake Rotorua of 435 tonnes which must be met by 2032. New rules are being developed to limit N loss from land-based activities. N will be allocated to individual properties via Nitrogen Discharge Allowances (NDAs) and regulated via a mix of consented and permitted activity rules. The latter includes permitted stocking rates for small properties, broadly equating to a maximum N loss of 18 kg N/ha/yr (in OVERSEER version 6.2.0). If the permitted stocking rates are not met, the landowner will need to demonstrate low N losses via an annual OVERSEER file (up to 18 kg N/ha/yr) or apply for resource consent to discharge higher levels of N.

The draft N allocation system is primarily based on making reductions from historic N losses applicable to the 2001-2004 benchmark period. These benchmark regulations, known as "Rule 11", oblige landowners to supply BOPRC with property, stock, fertiliser and information for the 2001-2004 period. BOPRC then carried out OVERSEER assessments that quantified property and per hectare limits of N and P loss. The draft N allocation system

applies property and sector specific N limits, called provisional nitrogen discharge allowances (pNDA) to be met by 2032. The average sector reductions relative to benchmark N loss levels are 35.3% for the dairy sector and 17.2% for the drystock sector.

Several reports commissioned in 2014 and 2015 focused on the likely impact of the new rules on larger dairy and drystock properties in the Lake Rotorua catchment e.g. Perrin Ag, 2014; Parsons et al, 2015. This focus reflected that larger “commercial” farms contributed most of the current N load and would bear most of the N reduction burden. However, small block owners became concerned about how they would also be impacted by the new rules.

### **The political context - small block owner concern over nutrient rules**

At several 2014 public meetings and in submissions to BOPRC, many small block owners expressed concerns that the draft rules were “unfair”. Small block owners and others initiated a social media campaign, fundraising and a legal challenge on the adequacy of consultation, all of which raised the profile of this issue. The level of concern is reflected in a comment quoted in local newspaper: “These rules will hit Rotorua hard but it will completely wipe Ngongotaha off the map” (Arthur-Worsop, 2014).

BOPRC did extend the consultation process and commissioned Landconnect Ltd to carry out the review of small blocks (Landconnect, 2015) upon which this paper is based.

It is worth noting that nutrient regulations already apply to rural properties over 0.4 ha in the Lake Rotorua surface catchment. Almost all properties over 40 ha were benchmarked but resource limitations resulted in relatively few properties under 40 ha being benchmarked. While awareness of Rule 11 amongst small block owners is low, those that were benchmarked did contribute to an N loss dataset that could be used in this small block review.



*Small Block owners raise concerns at Ngongotaha Hall, 2014 (from Rotorua Daily Post)*

### **Review objectives**

The small block review objectives were twofold:

- A. Characterise the small block “sector” by identifying the number of properties, number of people, the range of land uses, land valuation, and economic productivity;
- B. Assess the small block contribution to the current N load and their share of the N reductions under the draft rules.

## Methodology

The methodology was based around using BOPRC GIS land use and rating data, plus reviewing Census GST data (Statistics New Zealand, 2015) and relevant literature. Although the small blocks comprise diverse land uses, it is referred to here as a “sector” to distinguish it from the dairy, drystock and forestry sectors comprising properties over 40 ha.

Key elements of the analysis were:

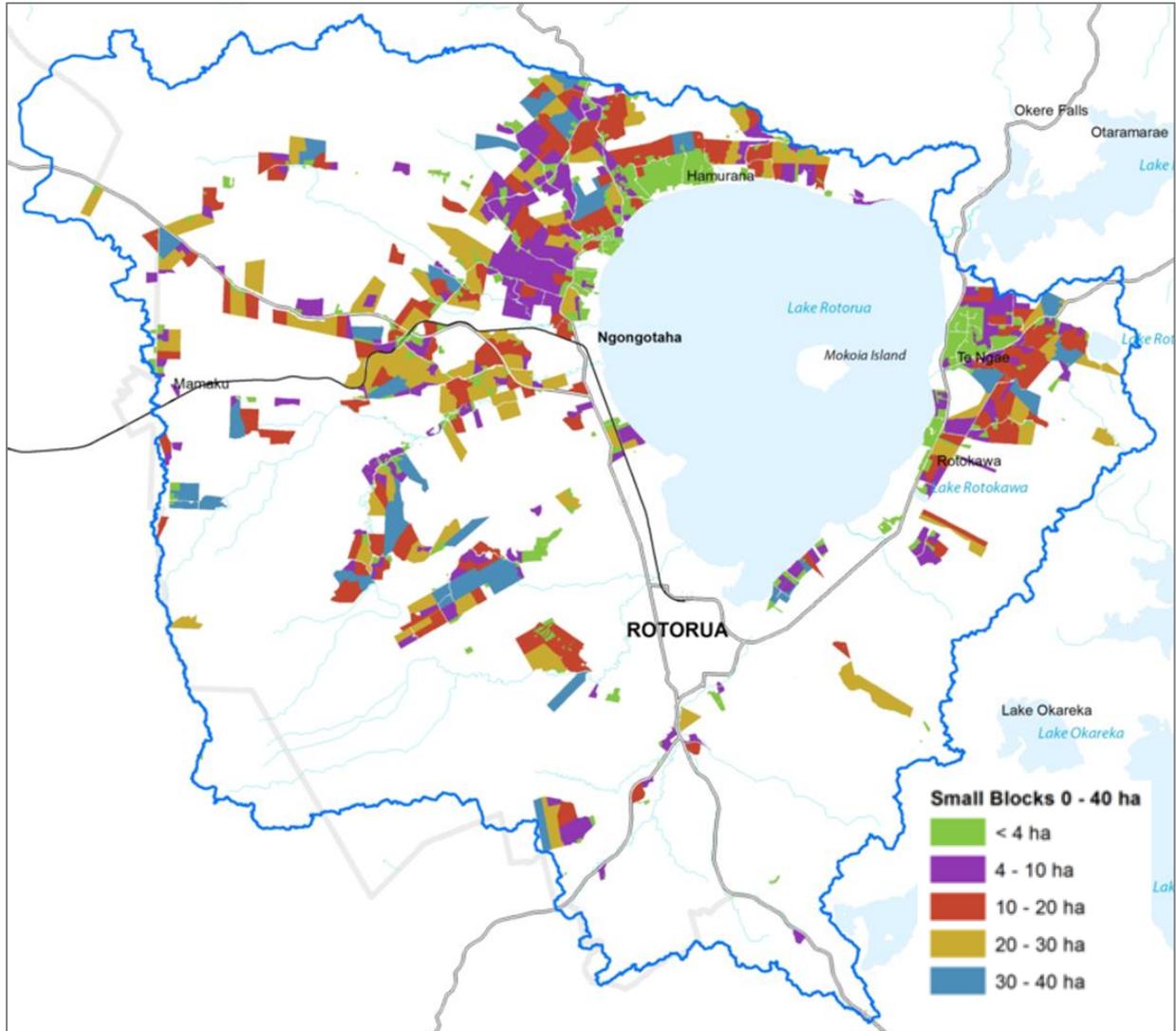
1. Small blocks were defined as properties less than 40 ha, based on “valuation references”, with size band stratification of 0.05, 2, 4, 10, 20, 30 and 40 ha. Valuation references are a pragmatic proxy for individual properties, even though larger properties (generally >40 ha) often comprise multiple valuation references.
2. The data was filtered to exclude small blocks that were part of larger farm operations.
3. GIS, GST, census and valuation data were used to characterise small blocks.
4. Small block N losses were estimated by using data from 58 benchmarked small drystock properties (21% of total small block area) and extrapolating their N losses across all small blocks for each property size area bands. This gave an assumed benchmark data set, focused on the effective area of small blocks.
5. The draft rules (as at November 2015), including their N allocation assumptions, were applied to each area band to give a series of N reduction scenarios. The combined small block N reductions were then compared with reductions from other sectors.
6. All N loss estimates calculated using OVERSEER 6.2.0

## Findings: Small block sector characteristics

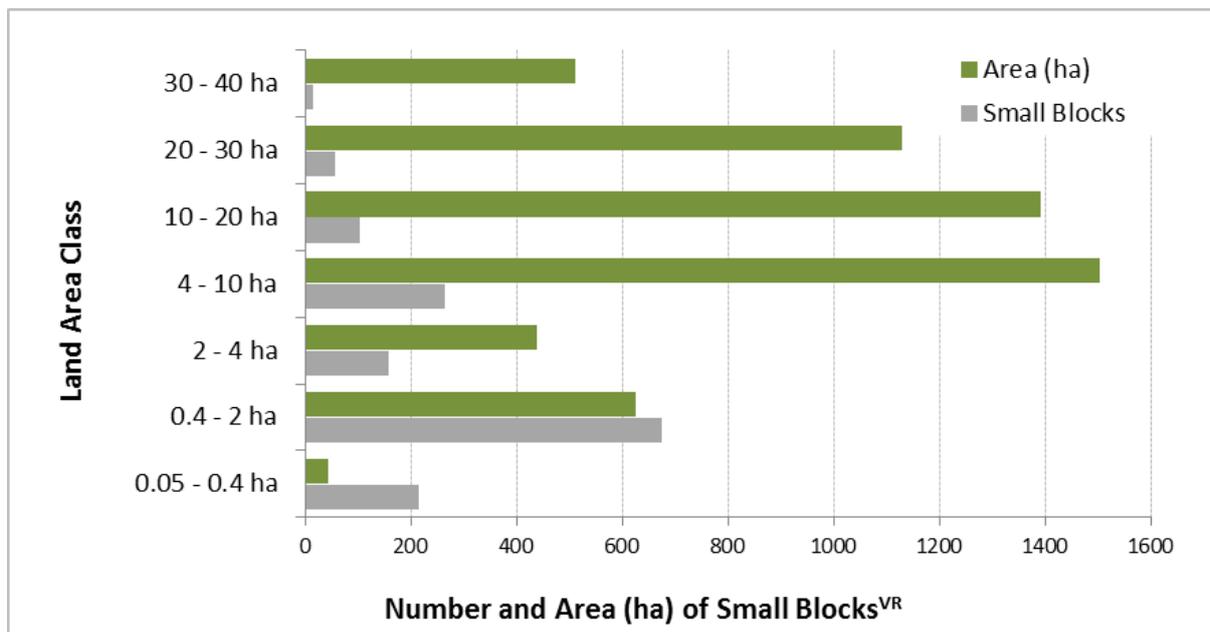
Key small block sector attributes for the Lake Rotorua groundwater catchment include:

- There are 1,484 small blocks, covering 5,634 ha
- Most are nestled on the edge of Lake Rotorua at Hamurana, Ngongotaha and Te Ngae, as mapped in Figure 1 below.
- Most small blocks are less than 4 ha i.e. 1,045 or 70% of the small block number. These covered 1,104 ha which is only 18.5% of total land in the small blocks. The overall distribution is shown in Figure 1 below.
- About 3,200 people live on small blocks.
- Small blocks have a combined land value of \$389 million, or 49% of the total rural land value of the Lake Rotorua catchment (\$800m in the 2014 valuation data).
- Maori land makes up 11% of total small block area, compared the 24% of total catchment area (NB: this data is for the Rule 11 area, not the groundwater catchment).
- Only 2% of small blocks less than 4 ha are registered for GST but the proportion rises to 50% for small blocks in the 20-40 ha band, indicating the latter have more in common with commercial farmers than “lifestylers”.

**Figure 1: Location of small blocks within the Lake Rotorua catchment**



**Figure 2: Number of small blocks and area**



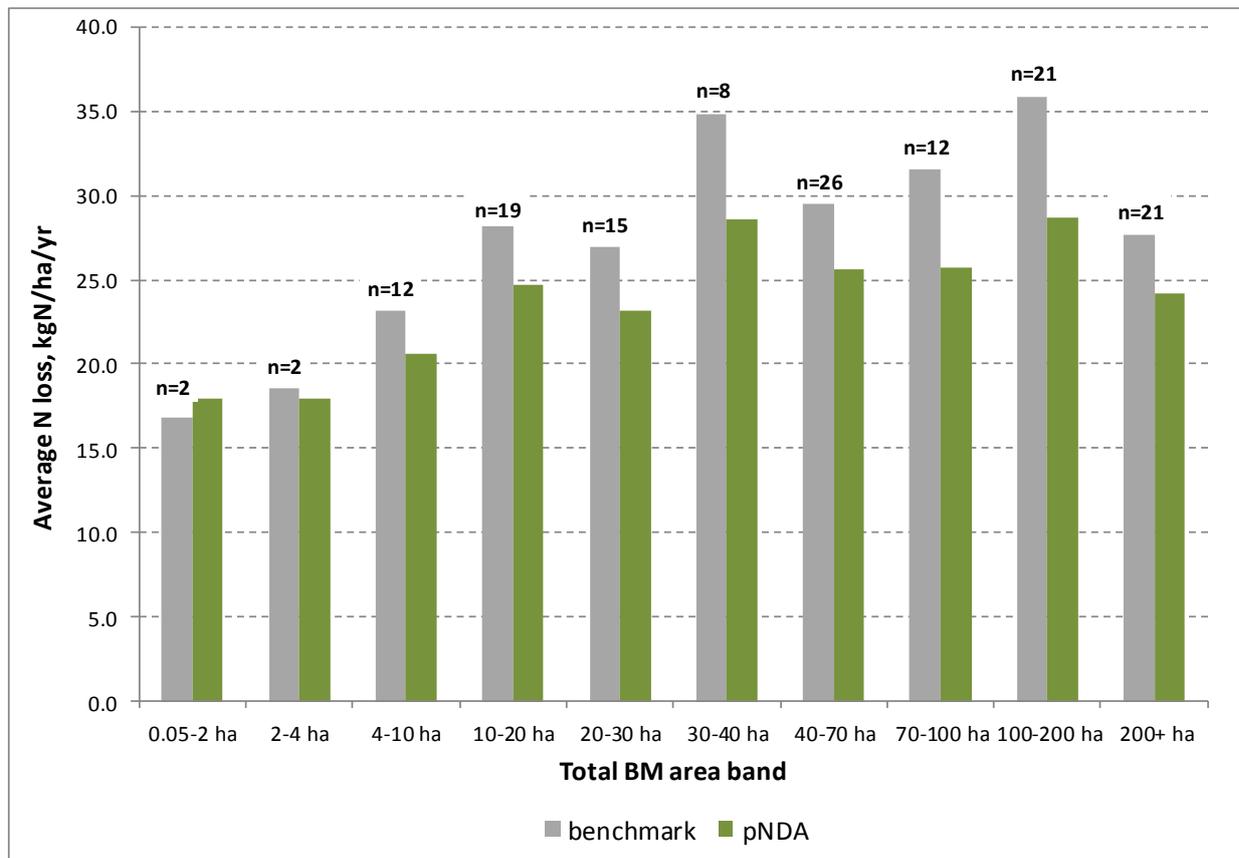
### Findings: Small block land use

The predominant land uses within the small blocks sector are dry stock (72%), bush, scrub and wetlands (17%) and dairy support (5%). The draft rules focus on “effective area”, defined as pastoral uses (Dairy and Drystock) plus crop and horticulture. The combined effective area of small blocks is 4,155 ha.

### Findings: Benchmark and provisional NDAs

There are 58 benchmarked small blocks. As their effective area was overwhelmingly dry stock, these were compared with the 70 benchmarked drystock farms over 40 ha, with all properties sorted by total property size bands, as shown in Figure 3 below. It is acknowledged that benchmark data is sparse for the smallest area bands and that this is not a representative sample of all small blocks. However, it does represent the best available data.

**Figure 3: Benchmarked drystock farms and provisional NDAs, OVERSEER 6.2.0**



### Findings: Extrapolation of benchmarks and pNDAs to the whole small block sector

The simplest extrapolation carried out was a simple pro-rata application of the "per hectare" benchmarked N losses across the whole small block sector. Additional scenarios assumed that differing proportions of small blocks would either opt for permitted status @ 18 kg N/ha/yr or, alternatively, some would opt to apply for resource consent and get a default NDA of 24.7 kg N/ha/yr. Key findings include:

- The pro-rata scenario indicated total small block sector N losses would decrease from 104 using extrapolated benchmarks to 92 tN/yr under the proposed rules framework, a 11.7 tN/yr reduction or 11.3%

- The small block N reduction increased to 15.9% in a “50/50” scenario where it was assumed that half the small block area would meet the 18 kg N/ha/yr level while the other half would get the default 24.7 kg N/ha/yr pNDA.

### Findings: The small block share of overall N reductions

It should be noted that significant reductions in N loss from small blocks have already been achieved by reticulating several lake-side communities. In terms of the new rules N losses from small block effective areas (i.e. pastoral areas), key findings are:

- The total small block N loss of 104 t N/yr from 4085 ha effective pastoral area represents 10% of total pastoral N load from 19% of total pastoral area.
- Average NDA levels were generally higher on bigger blocks within the 0-40 ha sector:
  - 21 kg N/ha/yr for 0.05-10 ha blocks.
  - 29 kg N/ha/yr for 10-40 ha blocks.

A more detailed summary is shown in Table 1, subject to all assumptions stated above, with the small block benchmark and pNDA figures based on the pro-rata scenario. The proportion of the N reduction burden faced by the total small block sector would rise, from the 4.4% shown in Table 1, to 6.1% in the 50/50 scenario.

**Table 1: Comparison of <40 ha drystock, >40 ha drystock and dairy benchmarks (BM) and provisional NDAs (OVERSEER 6.2.0)**

Land use (area band)	Effective area ha	Benchmark sum tN/y	Reduction to pNDA	Average BM kgN/ha/y	Average pNDA kgN/ha/y	% of total pastoral reduction
Small block 0.05-40 ha	4,085	104	11.3%	25.4	22.5	4.4%
Drystock 40+ ha	12,181	400	18.7%	32.7	26.6	28.3%
Dairy ha	5,016	503	35.3%	100.2	64.8	67.2%
<b>Total</b>	<b>21,282</b>	<b>1,005</b>	<b>26.3%</b>	<b>47.2</b>	<b>34.8</b>	<b>100.0%</b>

### Consequences of small block review for new rules

The “new” rules were publicly notified as part of a formal RMA plan change on 29 February 2016. The rules, including those applying to small blocks, are subject to change through the statutory process and therefore some caution is needed in considering the following implications and comments:

- The small block review was well received at a stakeholder meeting but with several comments that it should have been done much earlier in the process (Stakeholder Advisory Group, 2015).
- By the time the review was completed, BOPRC had already moved to adopt a 4 ha permitted threshold, provided there was no dairy, cropping or horticulture land uses

on such properties. This pragmatic approach greatly simplifies compliance for about 1000 small block owners.

- Further analysis and debate shifted the permitted threshold to 5 ha in the proposed version of the rules (BOPRC, 2016).

## **Conclusion**

There are a large number of small block owners in the Lake Rotorua catchment but they were not a key focus in early rule drafting and consultation. Political action by some small block owners and others highlighted the need for better information about the current small block N contributions and the likely reductions expected from them under the new rules.

The small block review showed that relatively modest N reductions were likely under the new rules. However, the small block review and a pragmatic policy approach led to a permitted activity area threshold of 5 ha, provided they avoid specified 'intensive' land uses.

## **References**

Arthur-Worsop S, 2014: "Angry locals hit back at lake nitrate rules". Article in Rotorua Daily Post, 11 November 2014, online [here](#).

BOPRC, 2008: Regional Water and Land Plan, Regional Rules Section 9, online [here](#).

BOPRC, 2015: Data and Mapping (Land use, Valuation References, Zoning, Catchment Boundaries, OVERSEER Benchmarked files), not publicly available.

BOPRC, 2016: Proposed Lake Rotorua Nutrient Management Rules, online [here](#).

Landconnect Ltd, 2015: Lake Rotorua Catchment Small Block Sector Review, prepared for BOPRC, online [here](#).

Parson O, Doole G and Romera A, 2015: On-Farm effects of diverse allocation mechanisms in the Lake Rotorua catchment. Report for the Rotorua Stakeholder Advisory Group, August 2015, online [here](#).

Perrin Ag, 2014: Rotorua NDA Impact Analysis, Phase 1 Project dated 16 June 2014. Prepared for Bay of Plenty Regional Council, online [here](#).

Stakeholder Advisory Group, 2015: Minutes for 10 November 2015, online [here](#).

Statistics New Zealand, 2015: Agricultural Census GST data; Census of Population and Dwellings.