BEFORE THE ENVIRONMENT COURT

In the matter of	appeals under clause 14 of the First Schedule to the Resource Management Act 1991 concerning proposed One Plan for the Manawatu-Wanganui region.
between	**FEDERATED FARMERS OF NEW ZEALAND** **ENV-2010-WLG-000148**
and	**MINISTER OF CONSERVATION** **ENV-2010-WLG-000150**
and	**DAY, MR ANDREW** **ENV-2010-WLG-000158**
and	**HORTICULTURE NEW ZEALAND** **ENV 2010-WLG-000155**
and	**WELLINGTON FISH & GAME COUNCIL** **ENV-2010-WLG-000157**
	Appellants
and	**MANAWATU-WANGANUI REGIONAL COUNCIL** *Respondent*

FURTHER INFORMATION BY DR JON ROYGARD AND MS MAREE CLARK PROVIDING A SUMMARY OF NUTRIENT BUDGETS HELD BY MANAWATU-WANGANUI REGIONAL COUNCIL FOR THE PURPOSE OF FURTHER MODELING

Dated: 9th May 2012

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Terms

TEB	=	technical evidence bundle
NV	=	notified version of POP
DV	=	decisions version of POP
MV	=	mediated version of POP
MCB	=	mediated compilation bundle

Summary of nutrient budgets held by Manawatu-Wanganui Regional Council

Overview

1. This supplementary information has been prepared to provide summary statistics from the set of 325 nutrient budgets held by Manawatu-Wanganui Regional Council. These budgets have been provided as part of a regulatory process or on a voluntary basis to the Manawatu-Wanganui Regional Council Consents or Environmental Protection teams (when inspections are being undertaken).

2. This information forms the first step in a three step process to model the approach proposed by Fonterra to catchment level outcome for SIN load. The second step is for Dr Ledgard to determine the likely reductions on a per hectare basis for each of the categories of the Fonterra proposal. The third and final step in this modelling is for Dr Roygard and Ms Clark to extrapolate these reductions to a catchment level outcome.

3. Map 1 shows the specified catchments for nutrient management and monitoring sites within those catchments. The monitoring sites have been modelled by Dr Roygard and Ms Clark (TEB v.11 p.5151-5243). The nutrient budgets have been summarised for these sites.

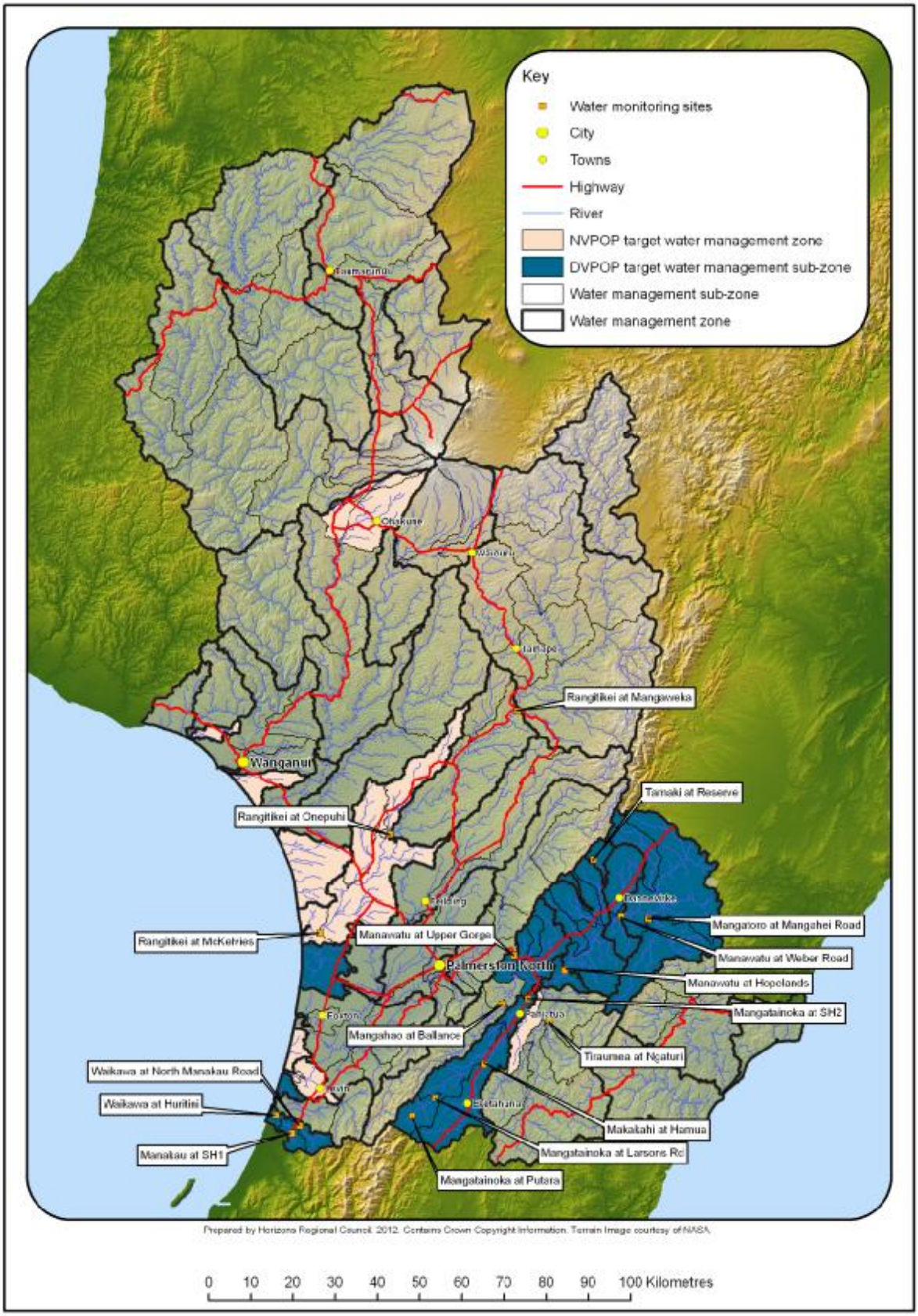
4. Table 1 provides the summary of this information for each site within a specified catchment. In addition to previously provided information, Table 1 also includes summary nutrient budget information for the four coastal lake catchments proposed for re-inclusion by some parties.

5. For a given site or catchment, the summary information in Table 1 is calculated based on all budgets upstream of the site. For example, a site such as Manawatu at Hopelands will include all of the nutrient budgets used to calculate the summary for the Manawatu at Weber

Road site (a site upstream of Manawatu at Hopelands) and any additional budgets from dairy farms in the catchment between the two sites.

6. As per a request by Dr Ledgard for Fonterra, Table 1 presents the proportion of nutrient budgets for each site/catchment with an N leaching value of less than 27 kg N/ha/yr and the average N-loss rate for these farms. Table 1 also presents the proportion of nutrient budgets with an N leaching value greater than or equal to 27 kg N/ha/yr and provides the average N-loss rate value for these farms.

7. Figures 1 to 15 provide information about the variation in annual N-loss rates in the sites/catchments presented in Table 1, based on all of the nutrient budgets held by Manawatu-Wanganui Regional Council as per the data set presented Dr Roygard and Ms Clark (TEB v.11 p.5151-5243). It is noted that the groupings on the histograms are in 2kg blocks, for example the 26 to 28kg block on the graph shows the numbers of farms with N-loss rates of 27 and 28 kg N/ha/yr.



Map 1: Location of the sites used in the calculations of the load scenarios in relation to the Target Catchment zones of the NVPOP and DVPOP. Note all DVPOP target catchments are also NVPOP target catchments.

Table 1: Summary of nutrient budget information held by Manawatu-Wanganui Regional Council showing average N-Loss rates for various sites/catchments. Numbers in brackets indicate the range for the group. ND indicates no data available.

	All			<27kg/ha/yr			>=27kg/ha/yr		
	n	% of all Dairy farms in catchment	Average N Leached	n	% of Farms	Average N Leached	n	% of Farms	Average N Leached
Manawatu Catchment	229 of 663	35%	23.4 (8-46)	154	67%	19.0 (8-26)	75	33%	32.5 (27-46)
Manawatu at Weber Road	13 of 39	33%	26.8 (14-41)	6	46%	20 (14-25)	7	54%	32.7 (27-41)
Manawatu at Hopelands	57 of 147	39%	26.1 (12-41)	29.0	51%	21.2 (12-26)	28.0	49%	31.1 (27-41)
Tiraumea at Ngaturi	5 of 7	71%	28.6 (17-40)	2	40%	18 (17-19)	3	60%	35.7 (27-40)
Mangatainoka at Larsons Road	ND	ND	ND	ND	ND	ND	ND	ND	ND
Makakahi at Hamua	9 of 34	26%	24.1 (13-38)	5	56%	17.4 (13-23)	4	44%	32.5 (27-38)
Mangatainoka at SH2	24 of 90	27%	24.7 (11-40)	16	67%	19.8 (11-26)	8	33%	34.5 (27-40)
Mangahao at Ballance	4 of 13	31%	34.8 (29-46)	0	0%	ND	4	100%	34.8 (29-46)
Manawatu at Upper Gorge	112 of 333	34%	25.3 (11-46)	67	60%	20.6 (11-26)	45	40%	32.4 (27-46)
Waikawa Catchment	1 of 7	14%	16	1	100%	16	0	0%	ND
Manakau at SH1	ND	ND	ND	ND	ND	ND	ND	ND	ND
Waikawa at North Manakau	ND	ND	ND	ND	ND	ND	ND	ND	ND
Waikawa at Huritini	ND	ND	ND	ND	ND	ND	ND	ND	ND
Rangitikei catchment	44 of 112	39%	21.8 (10-47)	36	82%	18.9 (10-26)	8	18%	35 (27-47)
Rangitikei at Mangaweka	ND	ND	ND	ND	ND	ND	ND	ND	ND
Rangitikei at Onepuhi	8 of 18	44%	26.4 (19-37)	5	63%	22 (19-26)	3	38%	31.8 (28-37)
Rangitikei at McKelvies	43 of 107	40%	22.0 (10-47)	35	81%	19.0 (10-26)	8	19%	35.0 (27 - 47)
Kaitoke Lakes	1 of 1	100%	20.0	1	100%	20.0	0	0%	ND
Southern Whanganui Lakes	7 of 10	70%	12.1 (4-18)	7	100%	12.1 (4-18)	0	0%	ND
Northern Manawatu Lakes	9 of 28	32%	13.6 (6-28)	8	89%	11.8 (6-18)	1	11%	28 (28)
Papaitonga	ND	ND	ND	ND	ND	ND	ND	ND	ND
Lake Horowhenua	3 of 10	30%	16.7 (14-21)	3	100%	16.7 (14-21)	0	0%	ND
Regional	325 of 950	34%	22.7 (4-55)	229	70%	18.4 (8-26)	96	30%	33.1 (27-55)

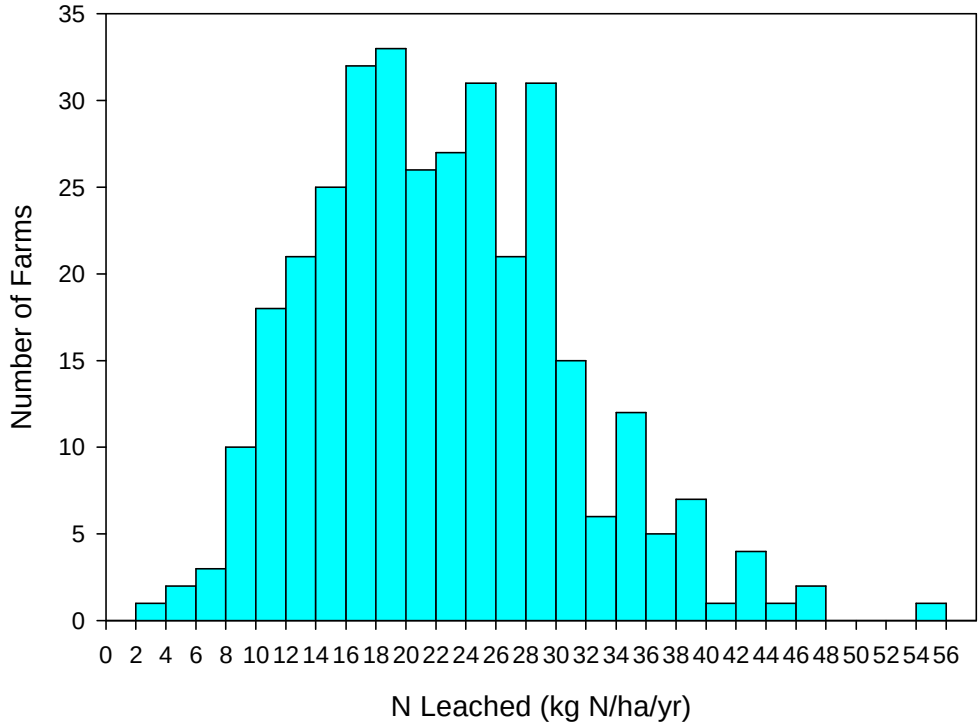


Figure 1: Regional summary of N leaching from nutrient budgets collected by MWRC. Sample size is 325 out of 950 farms in the Region. Average N Loss is 22.7.[1] kg N/ha/yr. Average N loss from farms leaching >= 27kg/ha/yr is 33.1 kg N/ha/yr.

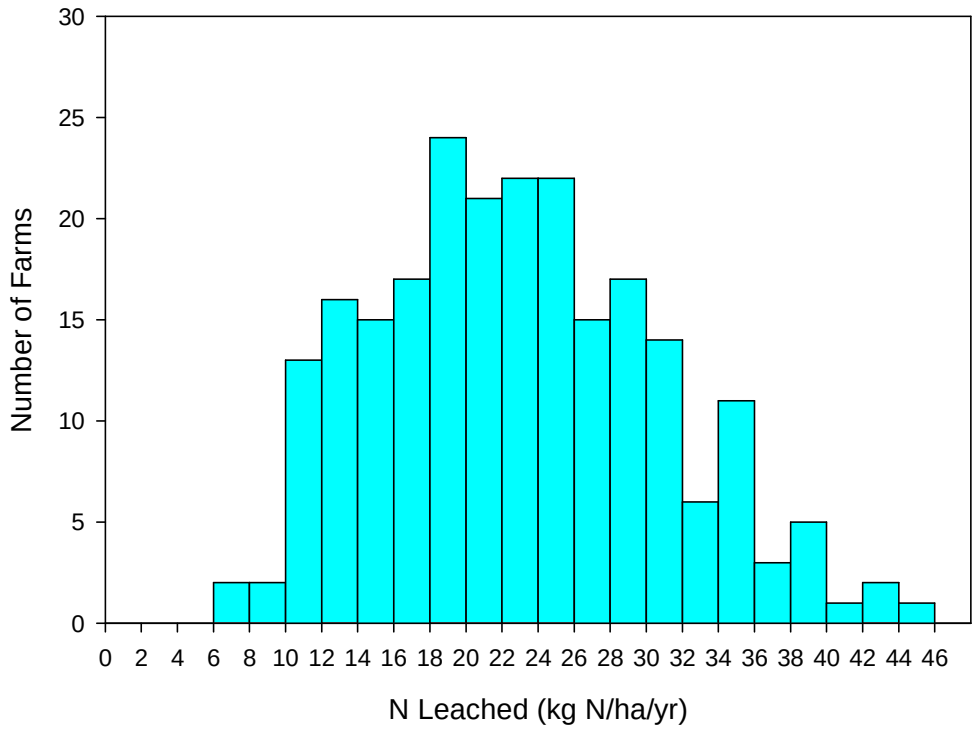


Figure 2: Manawatu Catchment summary of N leaching from nutrient budgets collected by MWRC. Sample size is 229 out of 663 farms in the catchment. Average N Loss is 23.4[1] kg N/ha/yr. Average N loss from farms leaching >= 27kg/ha/yr is 32.5 kg N/ha/yr.

[1] A value of 190 kg N/ha/yr leached has been removed from this dataset as the number did not make sense when compared to the leaching from the block summary.

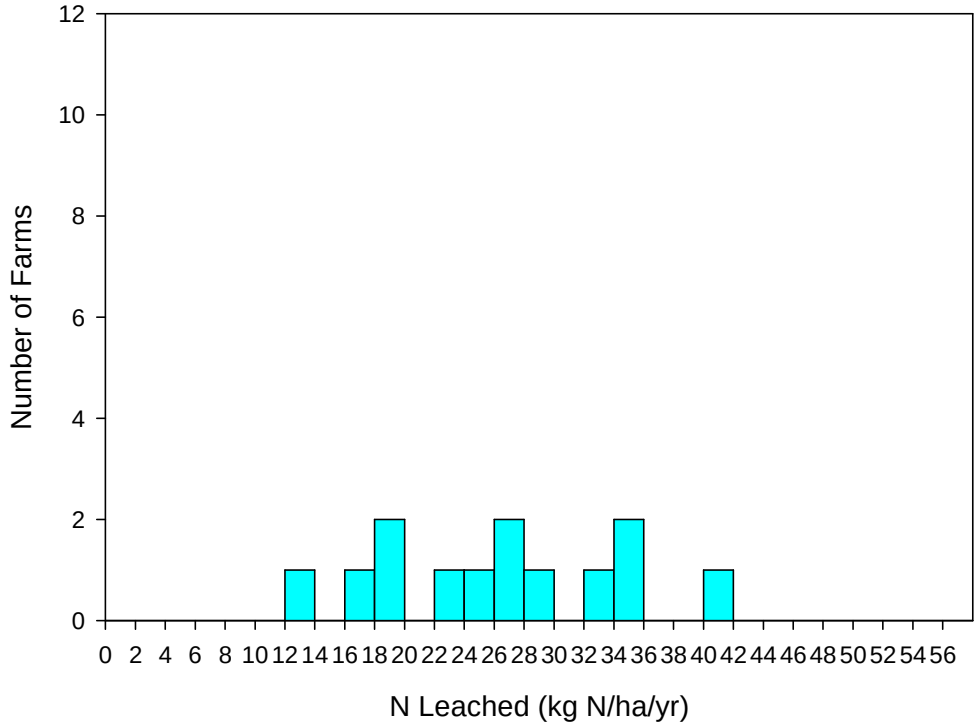


Figure 3: Summary of N leaching from nutrient budgets collected by MWRC in the Manawatu Catchment upstream of Weber Rd. Sample size is 13 out of 39 farms. Average N loss is 26.8 kg N/ha/yr. Average N loss from farms leaching >= 27kg/ha/yr is 32.7 kg N/ha/yr.

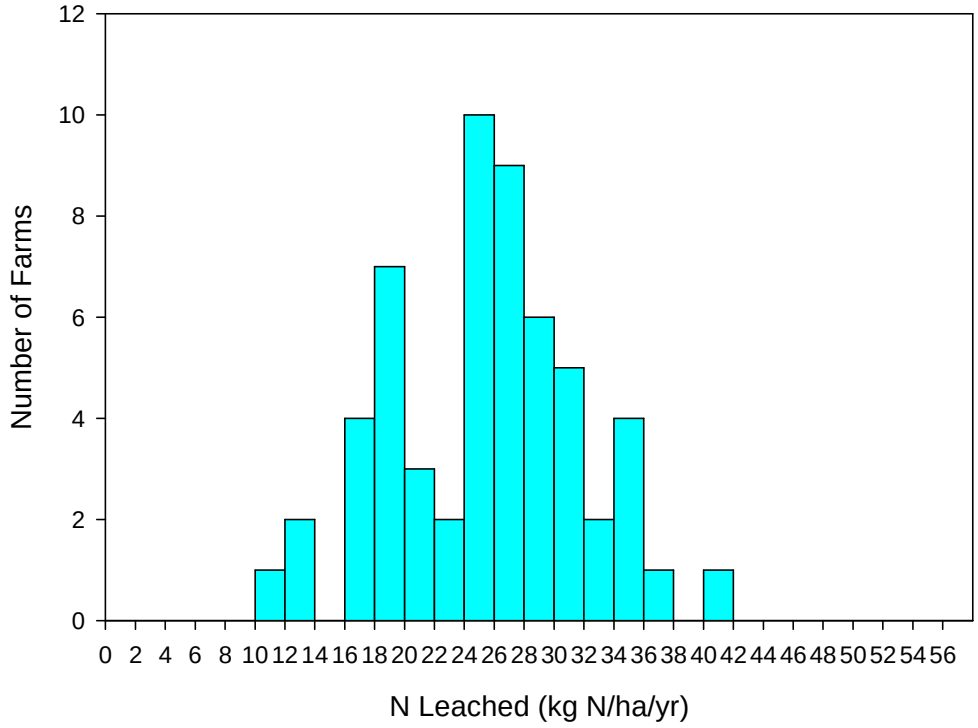


Figure 4: Summary of N leaching from nutrient budgets collected by MWRC in the Manawatu Catchment upstream of Hopelands. Sample size is 57 out of 147 farms. Average N loss is 26.1 kg N/ha/yr. Average N loss from farms leaching > =27kg/ha/yr is 31.1 kg N/ha/yr.

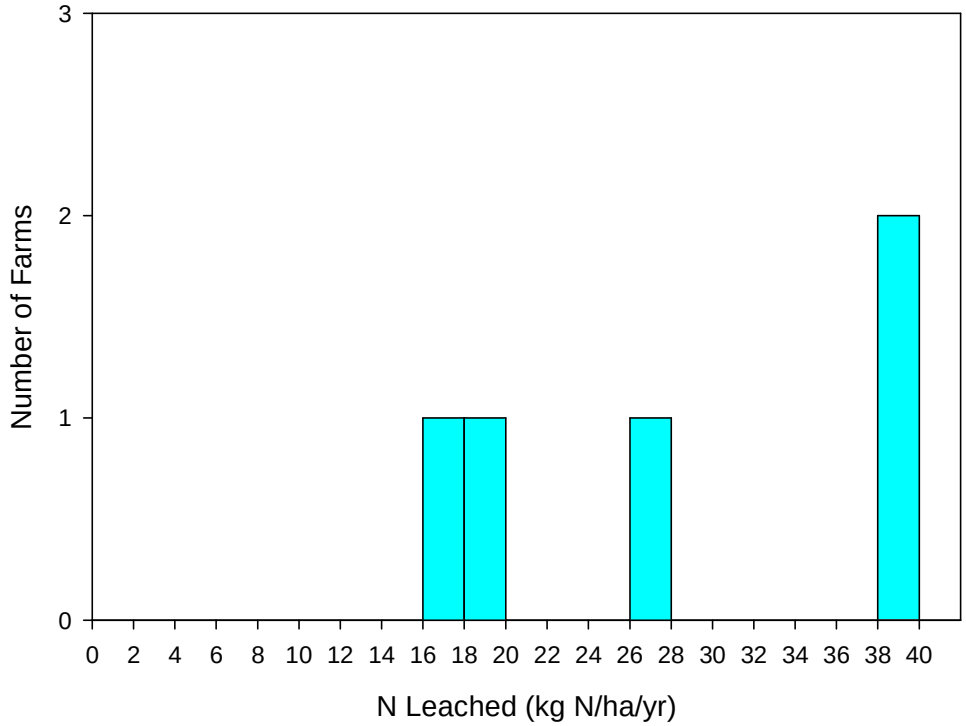


Figure 5: Summary of N leaching from nutrient budgets collected by MWRC in the Tiraumea catchment upstream of Ngaturi. Sample size is 5 out of 7 farms. Average N loss is 28.6 kg N/ha/yr. Average N loss from farms leaching > =27kg/ha/yr is 35.7 kg N/ha/yr.

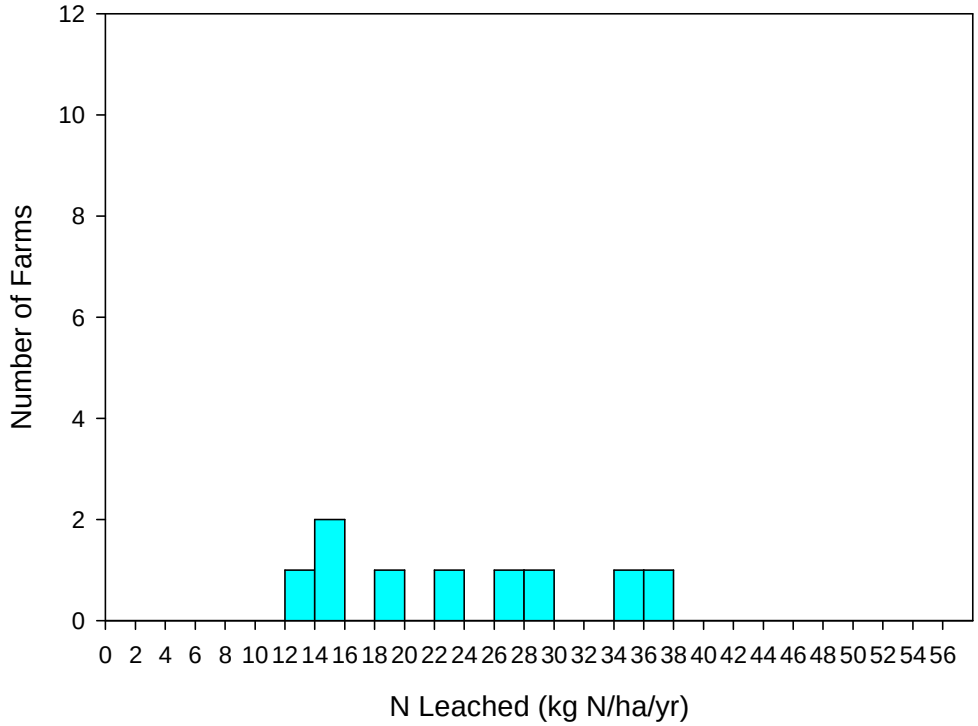


Figure 6: Summary of N leaching from nutrient budgets collected by MWRC in the Makakahi Catchment upstream of Hamua. Sample size is 9 out of 34 farms. Average N loss is 24.1 kg N/ha/yr. Average N loss from farms leaching >= 27kg/ha/yr is 32.5 kg N/ha/yr.

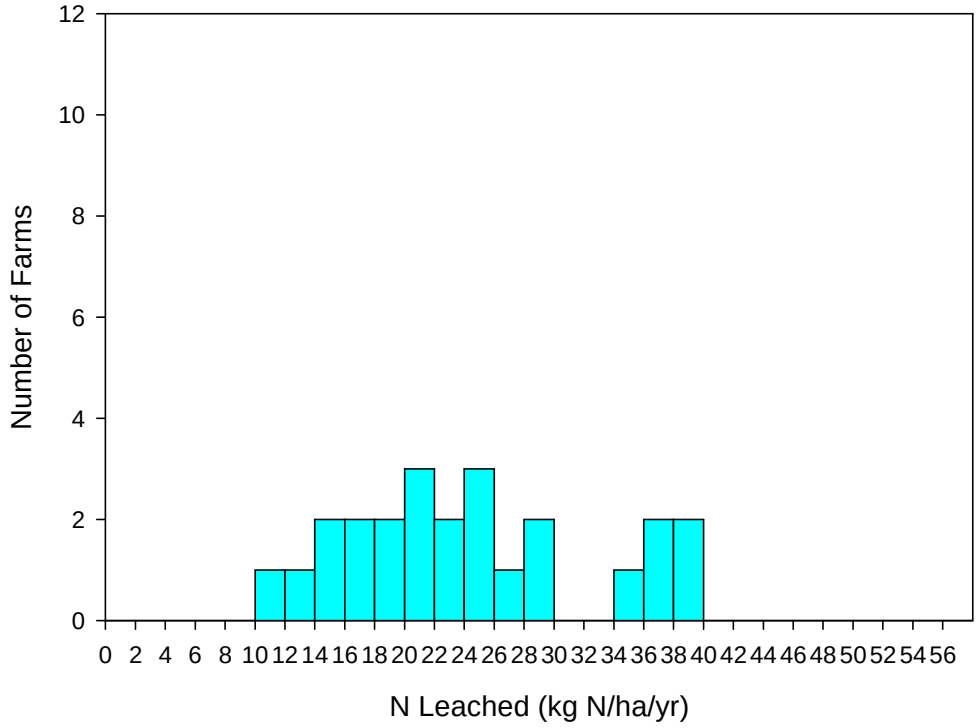


Figure 7: Summary of N leaching from nutrient budgets collected by MWRC in the Mangatainoka Catchment upstream of SH2 . Sample size is 24 out of 90 farms. Average N loss is 24.7 kg N/ha/yr. Average N loss from farms leaching > =27 kg/ha/yr is 34.5 kg N/ha/yr.

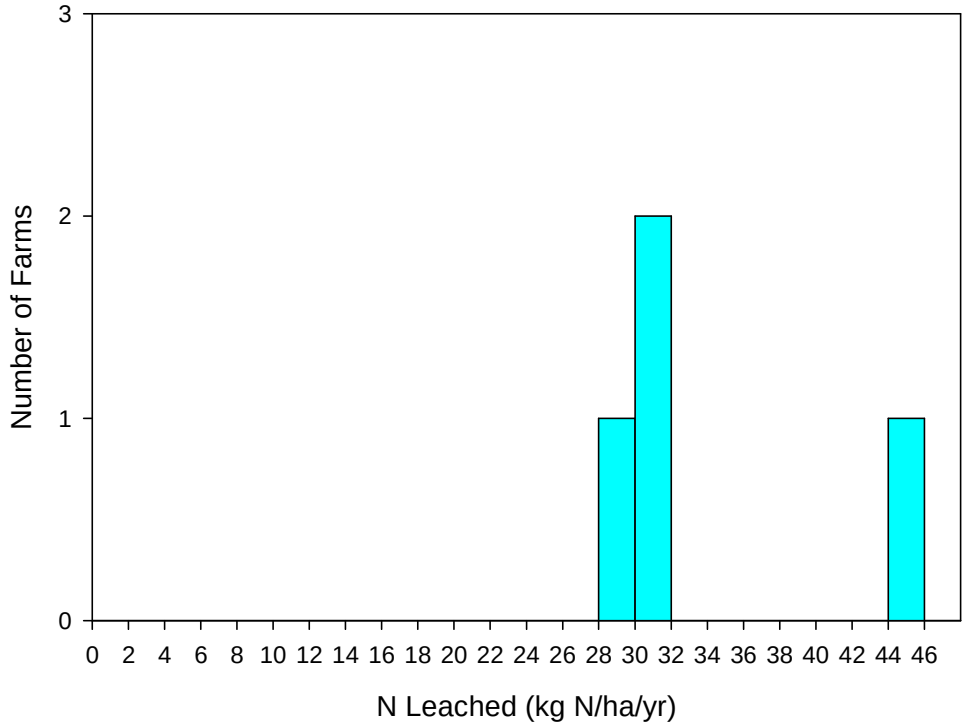


Figure 8: Summary of N leaching from nutrient budgets collected by MWRC in the Mangahao catchment upstream of the Ballance monitoring site. Sample size is 4 out of 13 farms. Average N loss is 34.8 kg N/ha/yr. Average N loss from farms leaching > =27 kg/ha/yr is 34.8 kg N/ha/yr.

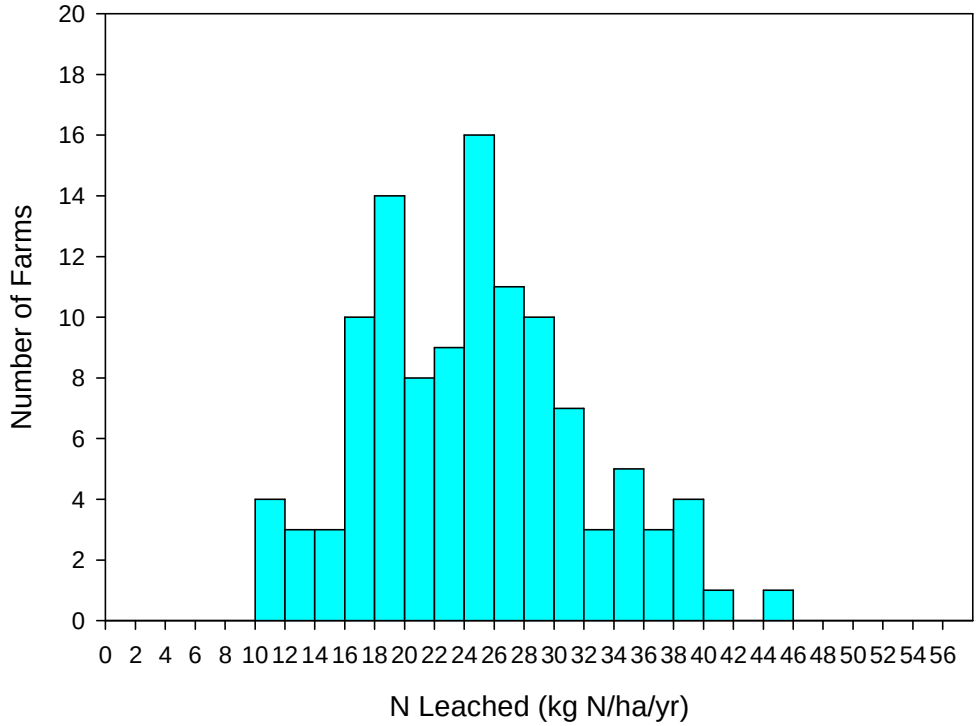


Figure 9: Summary of N leaching from Nutrient budgets collected by MWRC in the Manawatu Catchment upstream of the Gorge (Mana_1 – Mana_9 inclusive). Sample size is 112 out of 333 farms. Average N loss is 25.3 kg N/ha/yr. Average N loss from farms leaching > =27 kg/ha/yr is 32.4 kg N/ha/yr.

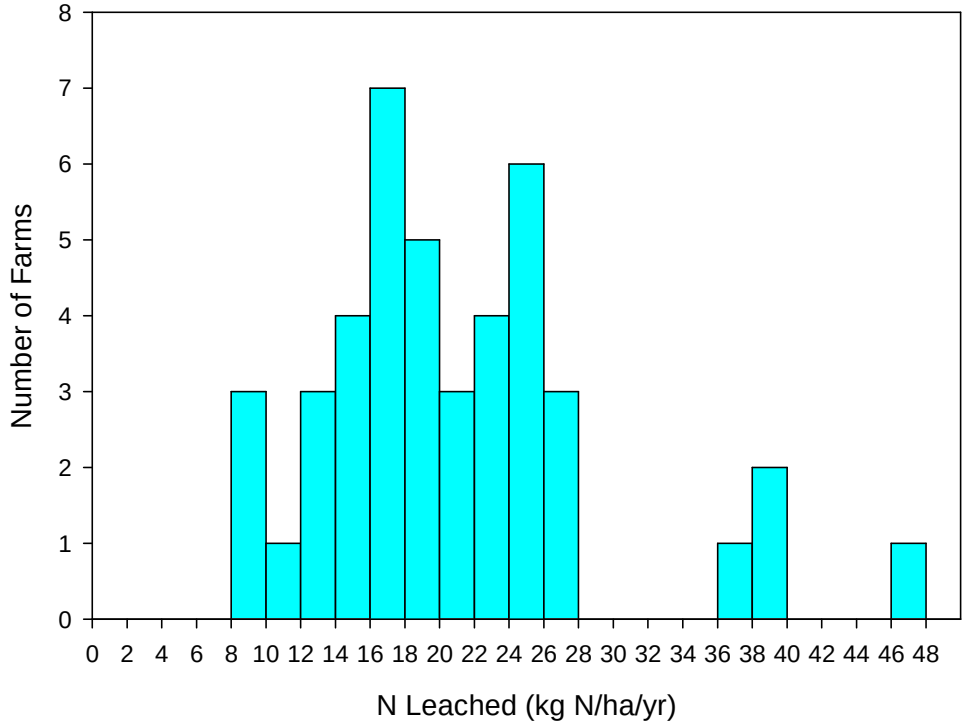


Figure 10: Rangitikei Catchment summary of N leaching from nutrient budgets collected by MWRC. Sample size is 44 out of 112 farms. Average N Loss is 21.8 kg N/ha/yr. Average N loss from farms leaching > =27kg/ha/yr is 35.0 kg N/ha/yr.

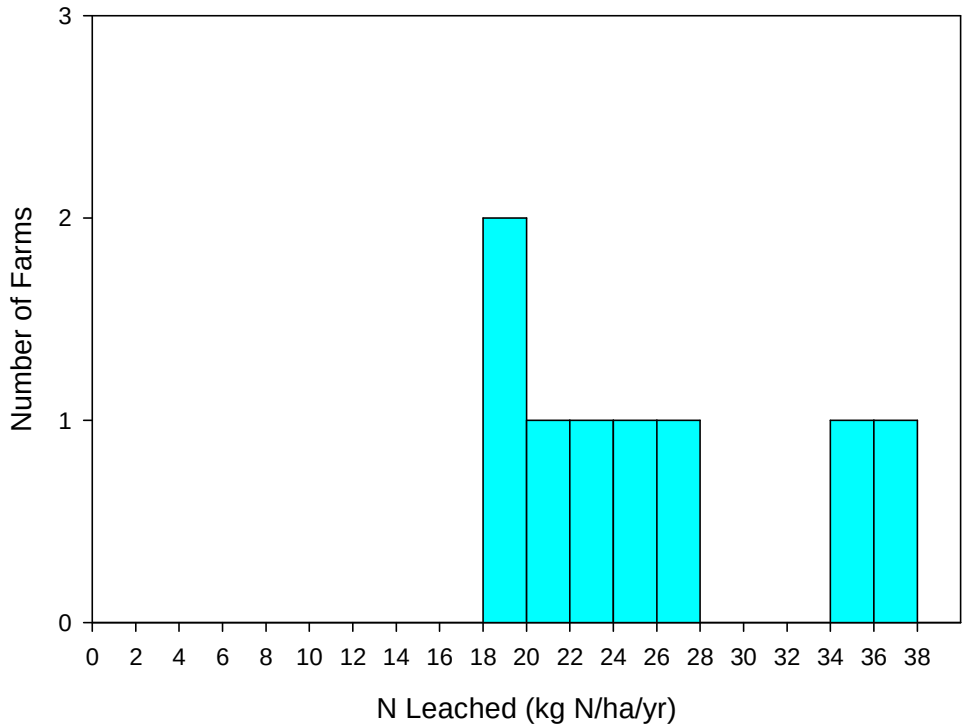


Figure 11: Rangitikei Catchment upstream of Onepuhi summary of N leaching from nutrient budgets collected by MWRC. Sample size is 8 out of 18 farms. Average N Loss is 26.4 kg N/ha/yr. Average N loss from farms leaching >= 27kg/ha/yr is 31.8 kg N/ha/yr.

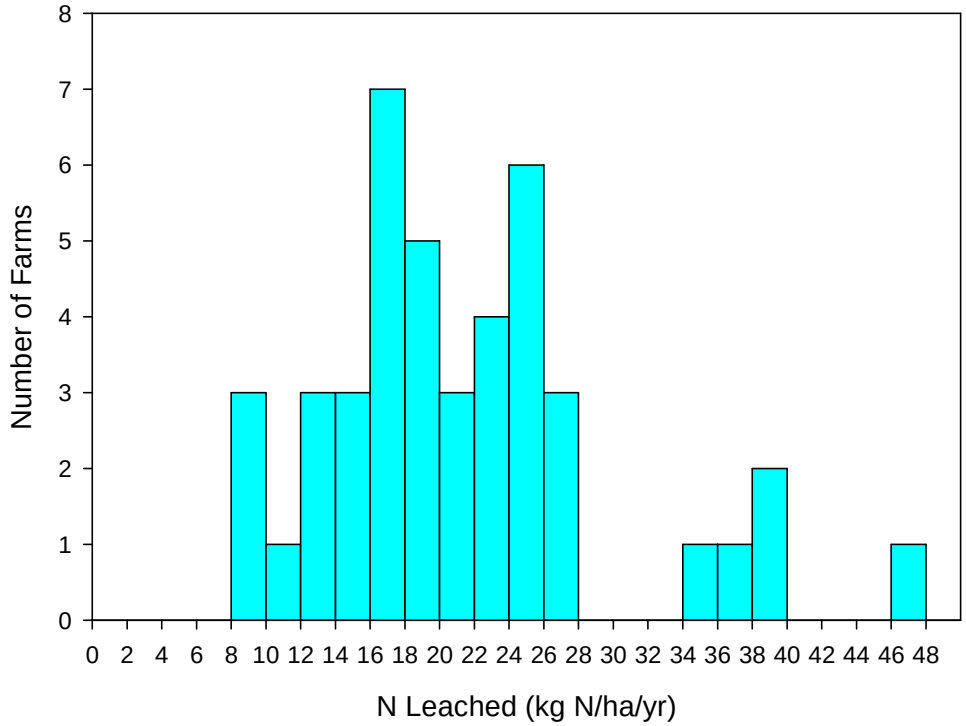


Figure 12: Rangitikei Catchment upstream of McKelvies summary of N leaching from nutrient budgets collected by MWRC. Sample size is 43 out of 107 farms. Average N Loss is 22.0 kg N/ha/yr. Average N loss from farms leaching >= 27kg/ha/yr is 35.0 kg N/ha/yr.

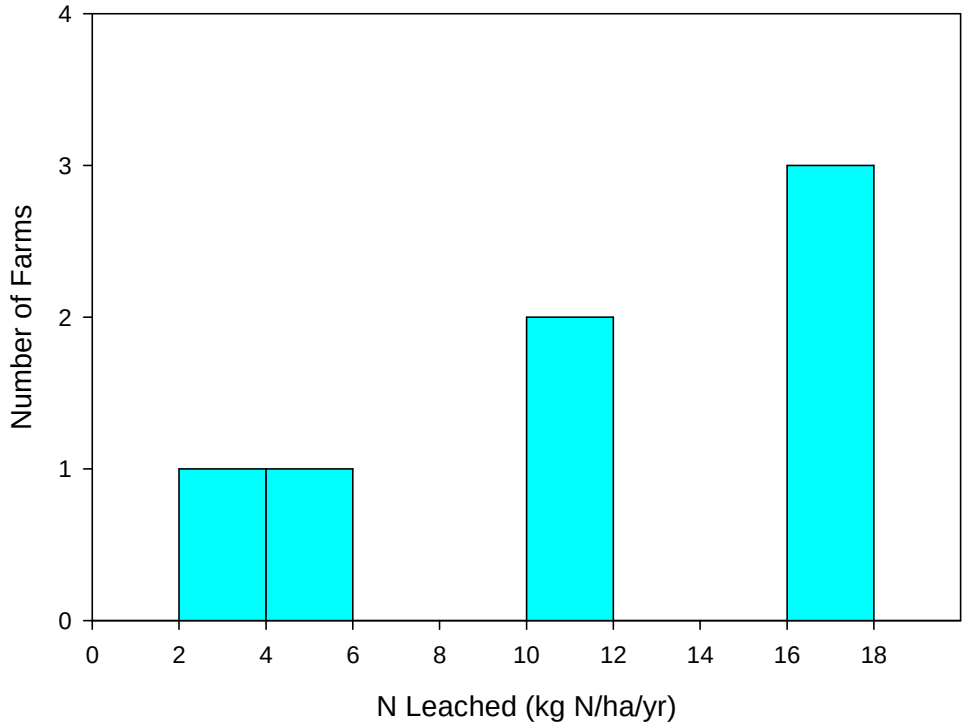


Figure 13: Southern Whanganui Lakes catchment summary of N leaching from nutrient budgets collected by MWRC. Sample size is 7 out of 10 farms. Average N Loss is 12.1 kg N/ha/yr. There is no data from farms leaching > =27kg/ha/yr.

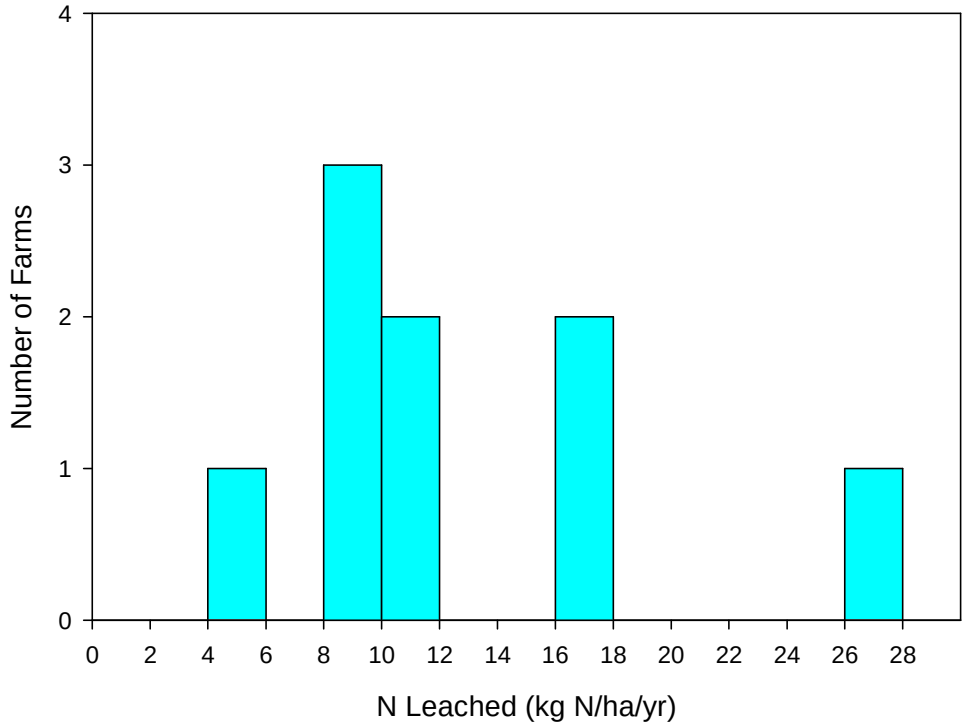


Figure 14: Northern Manawatu Lakes catchment summary of N leaching from nutrient budgets collected by MWRC. Sample size is 9 out of 28 farms. Average N Loss is 13.6 kg N/ha/yr. Average N loss from farms leaching > =27kg/ha/yr is 28.0 kg N/ha/yr.

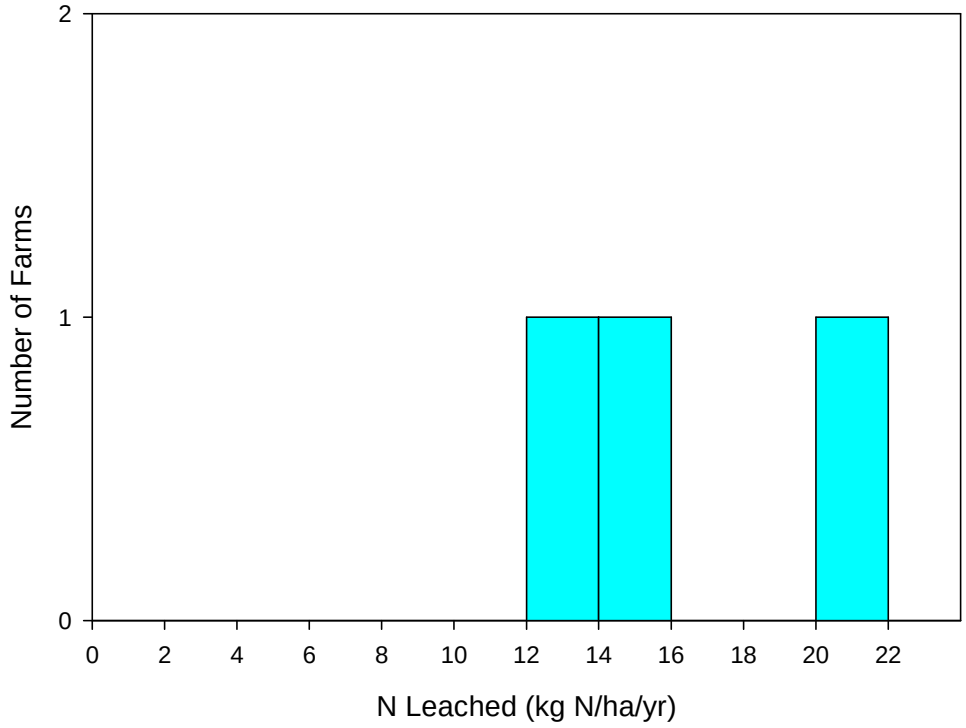


Figure 15: Lake Horowhenua catchment summary of N leaching from nutrient budgets collected by MWRC. Sample size is 3 out of 10 farms. Average N Loss is 16.7 kg N/ha/yr. There is no data from farms leaching >= 27kg/ha/yr.

Dr Jon Roygard

Ms Maree Clark