



PERRIN
AG CONSULTANTS

Perrin Ag Consultants Limited
Box 596 Rotorua
106 Lake Road
Rotorua, New Zealand
Ph 07 3491212, Fax 07 349 1112
consult@perrinag.net.nz
www.perrinag.net.nz

SUPPLEMENTARY PAPER TO THE FARMER SOLUTIONS PROJECT

TO: The Bay of Plenty Regional Council
FROM: Lee Matheson (Perrin Ag Consultants Ltd)
DATE: 8 March 2013
SUBJECT: Estimates of loss of capital land value associated with loss of nutrient
(specifically nitrogen) discharge allowance

NOTE: This paper should be read alongside the main FSP report and associated Farmer Feedback report dated 9 April 2013.

1. The Farmer Solutions Project ("FSP") identified the potential risk for capital depreciation of land within the Lake Rotorua catchment as a result of any policies that result in the right to discharge nitrogen to the ground water catchment having a tangible economic value, such as through N mitigation incentives or compensation.
2. The FSP included a basic analysis (Table 19) of generic bare land values for land classes in the catchment compared with the likely average allowable levels of annual N discharge for that class of land. It appeared that the property market was implying a similar capital value for the currently allowable N discharge (\$500-\$600/kg N) between dairy, sheep & beef and forestry land. This is presented again here in Table 1 below.

Table 1: Comparison of values for "N" between property market and FSP analysis

Land class	Current market value (\$/ha)	Typical N loss (kg N/ha/year)	Implied value of N from market (\$/kg N)	Value of N using profit analysis (\$/kg N)
Dairy	\$25,000	41	\$600	\$966
Sheep & beef	\$10,000	16	\$538	\$143
Forestry	\$3,000	3		
Dairy versus forestry			\$579	\$688

- This sits in stark comparison to our FSP modelling that indicates that dairying operations in the Rotorua catchment are in the order of two times more profitable per kg of N leached than sheep & beef farms – this observation suggests that the value of NDA on dairy land should have a higher intrinsic value.
- The implication of this analysis is that where landowners are incentivised to reduce N losses through changes in land use after land management changes have been exhausted **and** the incentives reflect only the productive value of the N relative to the next best alternative land use, owners of sheep & beef land will likely end up with a loss of asset value (and hence equity) relative to their starting position. This is demonstrated in Figure 1 below.

Before incentive		Post incentive	
Asset	Value	Asset	Value
1 ha of 16 NDA dry stock land	\$10,000	1 ha of 3 NDA forestry land	\$3,000
		Incentive payment for 13 kg NDA @ \$143 /kg	\$1,859
Total assets	\$10,000	Total assets	\$4,859

Change in asset value **-\$5,141**
-51%

Figure 1: Example of potential balance sheet change after N loss reduction incentives valued on farm gate productive impact.

- The reality is that any incentive or compensation paid for reductions in allowable nutrient discharge that sit below the current market implied value of the allowable nutrient discharge will potentially result in a loss of balance sheet equity for the affected farmers, irrespective of whether they are dairy or sheep & beef farmers.
- Table 2 below demonstrates the potential changes in the net land asset value of pastoral land owners in the Rotorua catchment depending on the value of any incentive paid for loss of allowable NDA associated with complete land use change to less intensive usage. As can be seen, at N values above \$333/kg N, dairy farmers experience greater net percentage changes in asset loss with land use change than sheep & beef farmers, while at capital NDA values below \$333/kg N sheep & beef farmers experience greater relative equity loss.

Table 2: % change in net land asset value associated with reduction in NDA to achieve complete land use change in exchange for an N "payment"

Value of 1kg N discharge allowance	\$600	\$500	\$400	\$333	\$300	\$200	\$150
Dairy land to sheep & beef	0%	-10%	-20%	-27%	-30%	-40%	-45%
Sheep & beef to forestry	8%	-5%	-18%	-27%	-31%	-44%	-51%

7. Despite the observation that all pastoral land users may be at risk of significant equity loss as a result of any moves to limit N (& P) losses from land use activity through land use change, we believe that the risk of equity loss is likely to be greater for sheep & beef farmers than for dairy farmers.
8. This is due to:
 - (i) the greater suite of cost effective land management changes that are currently available for dairy producers which may reduce the pressure to implement land use change on that class of land in order to achieve nutrient loss reduction;
 - (ii) the fact that sheep & beef land is already valued above its productive potential (as indicated by an average lower returns on assets relative to dairy farm land);
 - (iii) land use change to forestry is essentially a permanent change given the significant barriers to resumption of pastoral activity, irrespective of any regulatory restrictions; and
 - (iv) a possible "community" preference for the conversion to forestry of more marginal pastoral land (currently primarily in sheep & beef farming) given the wider benefits that afforestation has on Class VII land and above, particularly as it relates to sediment and P loss, and the apparent lesser impact on farm gate profitability that land use change on sheep & beef farms appears to have.
9. Until allowable levels of nutrient loss are allocated to the Lake Rotorua catchment and the extent of any incentive program is known, it is very difficult to estimate the extent of any equity loss that might occur within the catchment as a result of the proposed attainment of a 435t annual sustainable N load into Lake Rotorua.
10. However, if, as per the limited sheep & beef sample in the FSP, 60% of sheep & beef farmers were willing to consider complete land use change to forestry on the basis they

were fully compensated for any losses, then based on our estimate of 12,276ha of effective sheep & beef land in the catchment, current land values and a capital N value of \$143/kg, achieving this “voluntary” level of land use reduction would require compensation for \$34,781,000 of equity loss over and above the \$12,577,000 of potential N incentive payments.

11. Potential losses of equity on dairy farm properties from restrictions on allowable nutrient loss would be on top of the estimate in 10 above.

PERRIN AG CONSULTANTS