

BEST MANAGEMENT PRACTICES IN THE LAKE NGAROTO CATCHMENT

This factsheet aims to provide farmers in the Ngaroto catchment with current information on best management practices (BMPs) which can be implemented on farm to reduce the impact that farming has on the lake.

Three farms have already had Whole Farm Plans carried out and some of the BMPs which are already being implemented will be highlighted here.

Buck Macky's productive cows at a modest stocking rate, contribute to low impact farming within the catchment.

MAIN THREATS TO LAKE NGAROTO

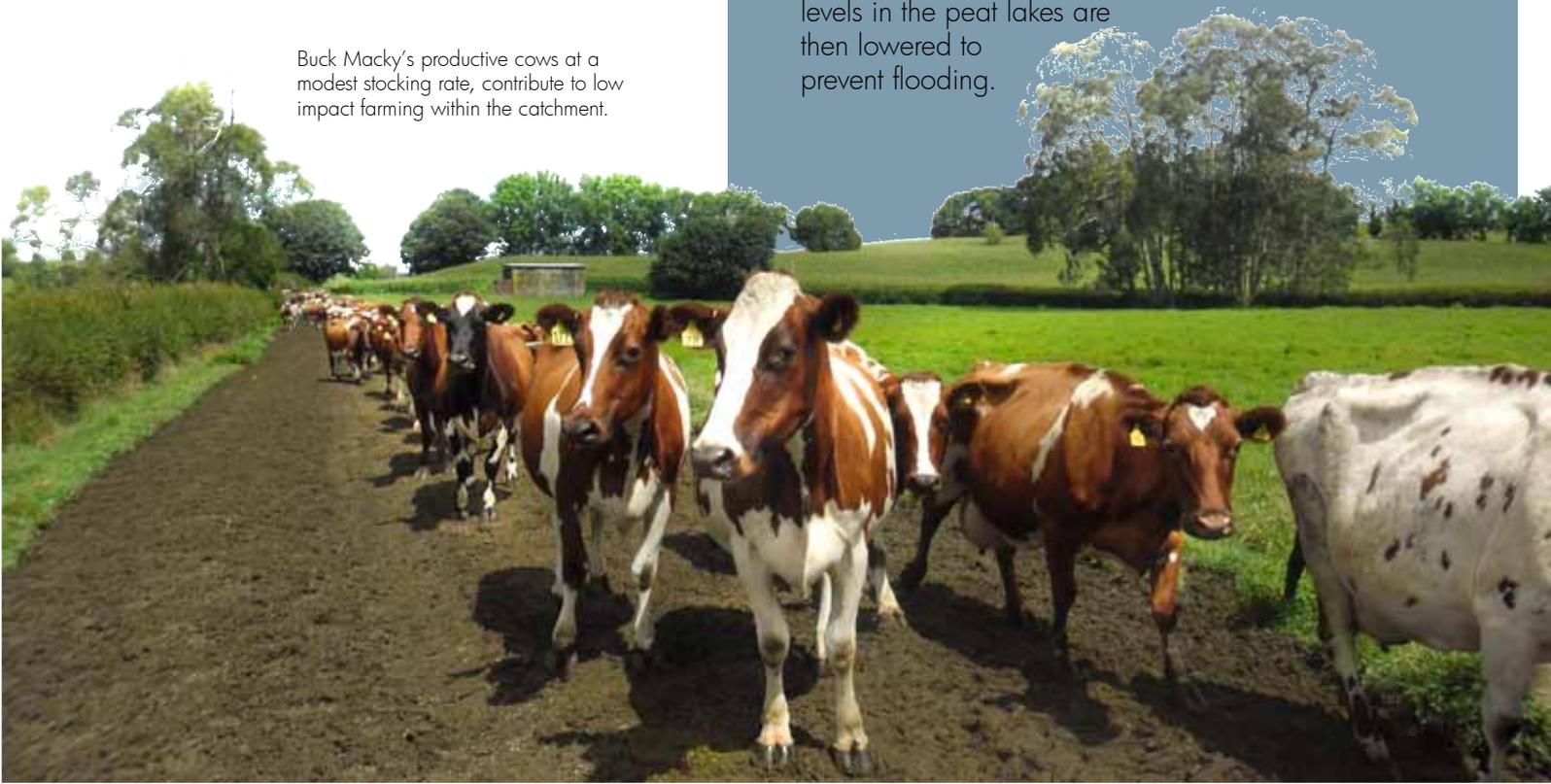
1 Nutrients and Sediment

Although nitrogen (N) and phosphorus (P) are critical for farm production, excess quantities entering lakes (through surface runoff, subsurface flows and via drains and streams) can be extremely damaging. Even small increases cause weeds or undesirable species to proliferate producing algal blooms. Increased sediment entering the lake results in poor clarity of the water which in turn affects the flora and fauna of the lake.

2 Drainage and cultivation of the surrounding peatland

Drainage and cultivation of peat soils for pasture and cropping results in oxidation and shrinkage of peat soil that cannot be reversed.

Deepening drains lowers the water table in surrounding farmland. However, the water level in nearby peat lakes becomes higher than the surrounding water table, causing water to 'spill out' onto neighbouring land. Lake levels in the peat lakes are then lowered to prevent flooding.



BMPS BEING CARRIED OUT CURRENTLY BY FARMERS NEAR THE LAKE. WHICH ONES ARE YOU DOING?

Action on Farm

- Converting pine plantations to native plants
- Planting steep sidlings and retiring and planting wet seeps in hillsides
- Wetland restoration
- Drains all fenced
- Modest stocking rate (<2.5 cows/Ha) with high pasture harvest and milk solids per hectare
- Low rate application for effluent using LARRALL system
- Planting deep rooting summer active species. (Chicory and Plantain)
- Redpath shelter for wintering cows
- Feeding cereals to improve dietary balance
- Retiring and planting areas that are wet and swampy
- Effluent is applied to >30% of the farm and there is adequate storage.
Manual storm water diversion is available
- Feed pad is used for stand-off over wet, winter months
- No winter cropping is done

Benefit to Environment

- Supports natural biodiversity, and improves long term aesthetic value of the property, as well as potentially providing a sustainable wood lot in the future....
- Reduction of soil erosion and nutrient losses, improves carbon sequestration which will also support biodiversity.
- Filters runoff from farms, allows support for wetland species, protection of vulnerable areas from stock simultaneously protecting stock from misadventure.
- Protects waterways from stock access. Prevents nutrients and pathogens entering the lake.
- Very low nutrient loss risk. Aids soil protection. Is a low cost and resilient farm system.
- Low applications and good storage means there is the ability to store effluent and use at a low rate at key times of the year = nutrient efficiency and low risk to receiving environment.
- Improves nutrient efficiency, helps cow productivity and draws nutrients from deep in the soil.
- Reduced pugging and pathogen loss in high risk months, soil protection and reduced runoff.
- Reduces the protein load for the cows which reduces urea load in urine, thus reducing the loss to groundwater.
- Grazing the wet/swampy areas causes significant soil disturbance resulting in Phosphate loss through soil erosion. Retiring wetlands is a major benefit to Lake Ngaroto as it reduces the Phosphate loads of the drains leaving the farm.
- This results in better nitrogen conversion efficiency and utilisation of a valuable nutrient resource. All cowshed and feed pad effluent is captured and pumped from the effluent pond. The large pond is then empty going into winter.
- Some pugging is avoided and soil loss is reduced.
- Soil loss through surface water runoff is not an issue.



CASE STUDY OF THREE FARMS THAT ARE IMPLEMENTING WHOLE FARM PLANS. WHAT SEPARATES THE BEST FROM THE REST?

In 2012 we had close engagement with over 35% of the dairy farms around the lake.

This year we hope to engage with more than 80% as we work towards improving awareness around what affects our lakes' health.

The farms in the catchment that are demonstrating low environmental footprints are doing some of the following key things, very well.

1. Stocking rate is aligned well to their pasture harvest – i.e. they are stocked at the optimum level for their farm. Their cows are consuming more than 4.3 T DM from home grown feeds.

Farmer A is stocked at 2.3, and Farmer B is stocked at 2.6 cows per Ha. This contributes to them being able to run a low cost, resilient farm system and also have a low rate of nutrient loss.

This system will fare well under the current milk price. There are no significant requirements for mitigations such as feed pads or shelters to reduce the farms footprint.

Both farms are still achieving more than 950 kg of Milk solids per Hectare.

Nitrogen Leaching from both of these farms is 40% lower than the regional average of 35 kg N leached per Ha.

Farmer A is at 19 kg N leached per Ha and Farmer B is leaching only 23 kg N leached per Ha.

2. Strategic and modest rates of nitrogen are being used, and yet their pasture harvested per Ha is still high compared with the regional average.

Farmer B is using 60 kg N per Ha per annum

Farmer C is using 80 kg N per Ha per annum

Both farms are still harvesting more than 12.5 T DM per Ha per annum which is above the district average pasture harvest of 11.8 T DM per Ha per annum.

These farms also have high nitrogen conversion efficiency.

3. Nitrogen Conversion to Product is high resulting in nitrogen conversion efficiency on three of the Lake Ngaroto farms in the catchment is well above 40%. This is high (good) for the region (average is closer to 32%), and reflects high levels of nutrient conversion efficiency on the farm.

High nitrogen conversion efficiency in these cases result from:

- Well balanced diets and good feed conversion to milk
- Milk solids per cow is above average
- Modest/strategic use of nitrogen
- Effective use of their effluent (more than 15% of farm area)



This Redpath Shelter on Finches farm ensures feed is utilised effectively, cows are comfortable and soils are protected at high risk times of the year.



Do you know what your farms diffuse losses are? i.e.

- Nitrogen Leached per Ha per Year
- Phosphate loss per Ha per Year
- Nitrogen Conversion Efficiency

Point source and diffuse losses affect the health of the lake, contribute to algal blooms in the warmer months resulting in the lake not being able to be used for recreational purposes, as well as the lake being unsafe for people and pets to be in contact with.

- Sediment
- Nitrogen via groundwater
- Phosphate via surface water
- Pathogens (bugs) via hot spots on farm and effluent management

can all be lost to the lake so being aware of these, and making necessary changes, will help you look after the lakes' long term health.

Through a mix of improved nutrient efficiency and reduced losses to the environment, farms may improve their profitability and resilience.

For more info contact Ngaroto@landcare.org.nz

Planting deep rooting summer active species like Chicory and Plantain improves nutrient efficiency, helps cow productivity and draws nutrients from deep in the soil.

