



Winning Margins: Waterways on Farms

Managing waterways *can improve your farm business*

According to farmers, the on-farm benefits of managing waterways include:

- reduced stock losses and easier mustering
- reduced erosion, conserving valuable soil
- future income from production tree assets
- improved stock health and weight gains from reticulated water
- transforming rough areas into attractive features.

Managing waterways and vulnerable areas also improves the quality of water leaving your property. This has benefits for the people living below you in the catchment, as well as for the plants, fish and insects living in those waterways. Many of our international markets are also seeking assurances that their food is produced in an environmentally sustainable way.

Keys to successful *waterway management*

- ✓ Keep stock out of waterways as a number one priority – they'll stay safe, stream banks will be more stable and your water quality will certainly improve.
- ✓ Choose a management approach to suit your farm business, whether it be a temporary electric fence around a wet area in the winter, reticulating your water supply or permanently fencing a stream. There's not necessarily one right answer when it comes to managing waterways.
- ✓ Decide what you want to achieve before you choose a management approach. Keeping 'bad' bugs or sediment out of waterways might only require you to keep stock out, while protecting freshwater life means planting banks to provide shade.
- ✓ If you're planning to fence a waterway, think about how you can use your new fence to improve paddock subdivision and grazing management at the same time.
- ✓ Don't bite off more than you can chew – it's better to work with a smaller area and keep it well-maintained than to fence off a large area and create a weed problem that's difficult to manage.

A guide *to this booklet*

Farmers often want to know how much it will cost to adopt environmental management practices on farms. This booklet tells you about the costs and benefits that some farmers have experienced when managing their waterways. All of the farmers included have been entrants in the Ballance Farm Environment Awards in the Waikato region. The range of different farms provides a variety of management challenges. Use the worksheet inside to estimate the cost (as at February 2004) of waterway management on your farm, while also considering the benefits for your business.

Farmer Stories
About
*Managing
Waterways*

Planted gullies

help control flooding



*Eucalypts interplanted
in gorse, Payze farm*

Environmental Benefits

- ✓ Soil conservation
- ✓ Lower flood flows in the catchment
- ✓ Less sediment in streams
- ✓ Reduced use of chemicals for weeds

Costs

- 💰 2-wire electric fencing using waratah standards (using contractor) = \$1.98/m.
- 💰 Planting 1.5 ha eucalypts with one tree every 3m x 6m would cost \$580. They spent about 10 days releasing in the first year.

When Arthur and Julie Payze decided to retire the steeper areas of their drystock farm in the hills above Matamata, flood control was not one of their intentions. But the work they've done has lowered flood peaks on the property and made the runoff a lot cleaner as well.

Arthur says that before they planted the hillsides with eucalypts, you could see sheets of water running off in a rainstorm and the drain water was dirty. Now, with their steep gullies and hillsides planted, the Payzes no longer have to replace their crossing at the bottom of the farm after washouts from the usual yearly flood. "It was really inconvenient because it would cut us off from the other side of the farm every time it happened." As the Payzes' neighbours are also retiring gullies, the extra infiltration of rainwater during storms should make a difference to downstream Piako flood peaks.

But it was gorse, not floods, which first motivated the Payzes to begin their fencing and planting programme. Some of the steeper parts of the farm were already in gorse and would have been costly to control. Instead, they decided to fence these areas, spray the gorse once and plant eucalypts. In later plantings, they cut holes into gorse with a slasher rather than spraying. In the first year, the young trees needed to be released by stomping the long grass down around them. Now, some of the early plantings are well above the gorse, while others are just over-topping it.

The Payzes chose to plant eucalypts even though they are higher risk than pines. The *Eucalyptus nitens* are planted in the southerly-facing sites because they enjoy cooler temperatures. On other sites, the Payzes have planted *Eucalyptus fastigata*, *E. muelleriana* and Tasmanian blackwoods.

Because they are busy with family, study and some off-farm work, the Payzes want to make their farming operation as profitable and easy to manage as they can. This has been a real motivation for planting trees on the more difficult parts of the farm. Mustering and weed control now take much less time and resources, although weed control on the farm boundary remains important. And by retaining the cutting rights to the trees, they can eventually pass the farm on to their children while maintaining a retirement income.

*... the work they've done
has lowered flood peaks on
the property and made the
runoff a lot cleaner as well*

Protecting swamps *saves stock*



New Zealand
Farm Environment Award Trust



Fenced wetland safe from stock on Mike and Sarah's dairy unit

Mike Moss and Sarah Tunnicliffe used to end up with around a dozen cows in the river over the course of a year. "If you're a cow down at milking, you never really know if you've miscounted or she's stuck in the river. Each cow lost to a river or swamp is worth \$1500 and that's not including her production. We didn't put up with it for very long before we fenced the river off!"

It was the same story with swamps on their 250 ha mixed dairy and drystock farm at Waitetuna, near Raglan. One big swamp "used to gobble up sheep like there was no tomorrow, so it was logical to fence it off." Mike and Sarah also found that if you don't fence a wetland, it can grow. Sheep and cattle push the firm land in at the edges, so the swamp keeps getting bigger.

They had considered draining their big wetland, but "with drainage you can spend thousands and you're never sure if it will work." So they fenced it off, and Sarah says "that was the big eye-opener for us. We began to notice that even in flood flows, the water coming out of there was clean, and in summer dry periods the wetland would continue to flow. We realised the wetland is just a huge sponge."



Mike and Sarah

Since the Waitetuna River flows out to the Whaingaroa (Raglan) harbour, the Whaingaroa

Harbour Care Society has donated native plants for riparian protection and given Mike and Sarah a hand at planting time. They use two wire fences by the river, to keep expenses down and minimise flood damage.

Mike and Sarah also owned another drystock farm up the valley, which they have since sold. They didn't think it was feasible to retire all the waterways on the hill country, so they progressively retired the main channels where it was practical and put in reticulated water. "It was hard work but there are definite stock health benefits from clean water."

Gullies that once were home to gorse and swamp were planted in pines. "Just on the dairy farm alone we took five percent of land out of production without any reduction in stocking rate, and by taking the gullies out we could use the land in between for dairying paddocks."

On the edges of some fenced bush areas, Mike planted blackwoods in places that will be easy to harvest. "If I've got half a hectare of blackwoods coming along then that's been a very sound economic piece of fencing."

... there are definite stock health benefits from clean water



Environmental Benefits

- ✓ Wetland filters runoff and controls flood peaks
- ✓ Native trees enhance habitat
- ✓ Less silt and dung ends up in Whaingaroa (Raglan) harbour where it could affect shellfish
- ✓ Productive soils protected

Costs

- 💰 2-wire electric fencing (using contractor) = \$1.89/m.
- 💰 Gates including gudgeons and undergate cable = \$131 each.
- 💰 To buy trees for 0.5 ha of blackwoods (3-4 m spacing) would cost \$280.
- 💰 300 native plants were donated by Whaingaroa Harbour Care for streamside planting. To buy these would cost around \$1000.



Retired gully and stream *provide forestry asset*



Eucalypt planting on steeper land

Environmental Benefits

- ✓ Wide riparian strips filter runoff
- ✓ Cleaner water flows into the Waikato River
- ✓ Steeper areas retired, protecting soil

Costs

- \$ 8-wire post & batten fence (using contractor) = \$8.16/m. The Trust saved money by using timber off the property.
- \$ To buy trees to plant 10 ha of pines (8,000 plants) would cost \$2,000. The 2 ha of blackwoods would cost \$1,120.

The Maori land block known as Waotu South 18 has about 500 shareholders, but John Waea, a Trustee of the Parekura Land Trust, is one shareholder who puts a lot of time into the place. The 274 ha property beside Lake Arapuni has three different lessees. Bill Jones runs cattle and dairy heifers on the biggest portion. Together Bill and John discuss the day-to-day management of the block and advise the Trust on future development.

Since 1991 around 54 hectares of gully and stream banks have been retired, about 13,000 trees planted, the original eight paddocks have been divided into sixty and stock water has been installed. Waotu South 18 is now a tidy block and the well maintained trees are an asset for future income. The planting and retirement also protects the quality of water flowing into the Waikato River.

When John first became a Trustee, the block was mainly scrub and weeds with some old wilding pine trees scattered around. As the block was in multiple ownership, getting credit for farm development was difficult. John suggested to the owners that they use the capital from felling the mature trees on the property to put in fences, gates and a stock water supply. With the backing of local kaumatua, the farm development has progressed steadily since.

The bore water supply installed in 1997 cost around \$20,000, including tanks at high points of the farm and troughs in every paddock. All the fence posts, battens and gates are made from timber from the property. John took advice from Environment Waikato about which areas to fence and plant to protect water quality.

The work has included fencing off their 6 km lake frontage and the creeks running down to it, and planting eroding washouts. Pines, blackwoods, Eucalyptus nitens, Cupressus lusitanica and C. macrocarpa have been planted. A 35 percent subsidy was available to protect the Lake Arapuni catchment, which helped the Trust to meet the initial costs of the work.

The Trust employed local workers for the project. "We taught them and ourselves to fence and to prune. You should hear them, the local boys talk Maori to the trees while they prune them" says John. "Pruning and looking after trees is really important. It's a waste otherwise."

John recently brought some of the owners out to show them the results. "They didn't realise how much had been done but once they saw all the trees they really were amazed – they saw where their money was going." For Bill, as a lessee, the immediate benefits have included knowing that stock won't get lost in the rough gullies on the block. "When I first got here, I lost two heifers in the first six months before it was fenced."

... the well-maintained trees are an asset for future income ...



John and Bill stop for a cuppa

Double-fencing drains

helps protect lake



New Zealand
Farm Environment Award Trust



Oliver Saxton

Oliver Saxton runs Lakelands, a bull farming operation on the shores of Lake Whangape in North Waikato. Managing bulls can require a little extra care, but Oliver finds that double-fencing his waterways makes the job easier.

“With a fence on either side of a drain, the mobs of bulls have that little extra distance between them. With a single fence, the bulls ride the fenceline, making a bit of a mess, but when you get them that little bit further apart by double-fencing the drain between paddocks, they don’t even look at each other.”

As the pressure comes off the fence, Oliver finds that maintenance costs are less. There is also a safety advantage, where if a bull breaks through one fence there’s another one to stop him. Oliver has used four-wire electric fences (when they were running sheep), and more recently two-wire electric fencing for his drains. Posts are spaced about 15m apart.

Fencing helps to keep Oliver’s drains in good condition, preventing stock from damaging the banks. It reduces cleaning frequency and cost, and keeps the water cleaner – the main drain takes water off the farm to Lake Whangape.

There are lots of swampy fingers stretching back from the lake and Oliver has fenced some, finding the regenerating trees provide good shelter for stock. But the first priority has been the main swamps and drains, where stock loss was the incentive. “With all the fencing, we have probably taken a hectare out of production, but losing one animal would negate the grazing you would have got from that for a couple of years.”

Oliver plants poplars because they are fast-growing, and other species too, getting bargains from nurseries where he can. “I have thought about taking down the fences now the trees have grown, but I won’t. For me, having quite a few pheasants is worth more than grazing every square inch.”

Weeds have not been much of a problem – Oliver spends about two days a year spraying the retired areas. There are more weeds in areas he hasn’t planted, but Oliver values the role of this rough grass for filtering runoff.

And is all this work an asset to the farm? “Yep. It’s all in the eye of the beholder of course. The trees break up the farm, give it a bit more interest – it’s a bit bland otherwise. And from my point of view, I might lose four stock in the lake that would cost me \$2000 a year, whereas putting up the fence cost me \$1800 once. And it’s the peace of mind, knowing the stock aren’t in there.”

Fencing helps keep Oliver’s drains in good condition... and reduces cleaning frequency

Environmental Benefits

- ✓ No stock access to drains
- ✓ Grassy strips filter runoff to Lake Whangape
- ✓ Less pugging along fencelines

Costs

- 💰 2-wire electric fencing (using contractor) = \$1.61/m.
- 💰 Crossings = \$150 each.
- 💰 Oliver saved money on the pipes by buying “seconds”.
- 💰 Water supply = \$290 per trough installed.
- 💰 1 ha of poplars and alders. To buy these plants for 10m spacing would cost \$300. Oliver saved money by taking cuttings off existing poplars. He spent about 10 hours spraying and releasing.



A good water system *means healthier stock*



Environmental Benefits

- ✓ Stock spend less time in waterways
- ✓ Less dung and sediment in water
- ✓ More even grazing protects soil

Costs

- ⌘ New water system cost \$16,000 for 70 ha (10 paddocks) on land purchased in 1997.
- ⌘ Extensions of the existing water system on the main farm cost an average of \$670 per paddock using contractor labour.

Barrie and Jude Tatham own a 498 ha drystock farm near Piopio, which they operate in a share-farming arrangement with Kieran Bradley, running cattle, dairy grazers and sheep.

The contour and instability of the limestone and rugged papa landscape make it impractical for the Tathams to fence all of their stream banks to protect waterways. Instead, they have focused on providing alternative water and stock shade away from streams. They have found this reduces the time stock spend in and around natural water. "Our observation is that as soon as you put trough water in, it keeps stock right out of swamps and streams. It's fascinating to see what a difference it makes when you first put a water system in – you can see how the edges of the swamps are all grassed over now. Stock just don't go there."

Water is pumped from three different springs up to high points on the farm and then gravity-fed to the troughs, which now serve over 80 percent of the property. The first stock water supply was installed in 1983, with many additional troughs installed over the last few years. Extending the water supply has allowed the original 35 paddocks to be divided into a current total of around 90.

For the Tathams, a good stock water system is a natural progression with farm development. "Clean water has got to be good for the stock, especially the young stock. You can talk to anyone who puts a

water system in, they always say their lambs do that much better." Barrie and Jude find that their bigger paddocks (5-6 ha) need two troughs, but a single trough is sufficient in smaller paddocks (2-3 ha). Troughs are installed at a central point so the paddock can be subdivided using electric tape, for more controlled grazing.

In terms of shade, the Tatham's have found that one big poplar in a paddock is enough, as long as it is planted in the west to give afternoon shade. But they prefer to plant two or three poplars per paddock because they believe plenty of shade can prevent pleurisy (viral pneumonia) in sheep. "Pleurisy can be a real killer of lambs from February to April. If you have a lighter stocking rate and more shade, you have less chance of mobbing under a single tree and spreading the virus. It's just good farm management." Each shade tree is fenced to protect it while it is young, but Barrie says the poplar poles themselves were cheap, and he now cuts his own from previous plantings.

For the Tathams, a good stock water system is a natural progression with farm development

Fencing swamps

improves subdivision



New Zealand
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Bill Garland

Farming bull beef and sheep on the slopes of Maungatautari Mountain, Bill and Sue Garland aim to marry profitability with long-term sustainability. They make a special effort to find low-cost ways to improve farm management without compromising the environment.

One example is the single-sided fencing of swampy gully bottoms on the property. This prevents cattle from crossing backwards and forwards, protecting the swamp and allowing native raupo to regenerate. Cattle graze the raupo along the edges when they need roughage but it doesn't seem to affect the wetland much.

Swamp fencing was done as part of the Garlands' farm subdivision programme. "When we got here, there was one 60-acre paddock and two others. All the fences went straight up the ridgelines and every paddock had swampy areas where cattle would get stuck. Mustering was a nightmare." The need to re-fence and subdivide provided an opportunity for relocating fences to maximise environmental benefit while getting better pasture control and minimising the time spent mustering. Bill uses permanent seven-wire fences with one electric wire.

As the Garlands re-fenced, they provided troughs and shade trees further uphill, with clear benefits both for the animals and farm profitability. "Cattle don't graze at midday in summer; they stand in creeks to keep cool. Put water and shade at the top of the

paddock and stock will graze the area more evenly and put on more weight. I've had cattle killing out at 30kg heavier in these paddocks. And there are more facial eczema spores at the bottom of paddocks, so the less time they spend down there the better."

Reducing grazing pressure is an important factor. "If you keep grazing pressure down a bit in sensitive areas, it keeps costs down. If you force stock into swamps, then you'll lose some." Bill reckons he still loses ten sheep a year in swamps around the farm, an annual loss of around \$700 – but he used to lose three times this, and cattle as well.

The Garlands are also concerned about the impacts of their heavier classes of stock on stream banks. They only graze calves and sheep in some paddocks with unfenced streams and they have put in sheep crossings to reduce damage. They use their own design built from half-rounds (costing around \$325 per crossing), with the added advantage that they put their fences on the crossing so they don't need a floodgate.

"Put water and shade at the top of the paddock and stock will graze more evenly and put on more weight"

Environmental Benefits

- ✓ Less grazing of wetland plants
- ✓ Wetlands filter farm runoff
- ✓ Less silt in streams and more stable stream banks

Costs

- 💰 8-wire post and batten fence (using contractor) = \$8.16/m.
- 💰 Earthworks for hillcountry fencing = \$1.40/m.
- 💰 Water supply = \$225 per trough installed.



Fenced stream banks

stable and safe for stock

Environmental Benefits

- ✓ Less silt and dung reaching Mangahoe Stream
- ✓ Better stream habitat and stable stream banks
- ✓ Nutrients removed from runoff water in drains

Costs

- 💰 Fencing (using contractor)
2-wire electric = \$1.89/m.
4 wire with 2 electric = \$2.42/m.
- 💰 Planting: 1500m x 2.5m area of various ornamental exotics. To buy these for 2.5m spacing would cost \$2,700 (\$4.50 per tree). John spent 12 hours spraying and releasing.

John and Thelma Bailey own a dairy farm in the fertile Waikato basin at Puhue. John manages riparian areas on the farm to protect their productive land, ensure stock safety and create an attractive landscape.

Two-wire electric fencing now excludes cows from drains and the Mangahoe Stream on his boundary. In the past, calves with ryegrass staggers have stumbled into drains, and as John says, cows are valuable.

Fencing waterways also prevents the banks from collapsing. John sets his fence between 1 and 3 metres back from the bank and is not concerned about the lost grazing. "We can get a huge volume of water down this stream and if you lose twenty feet off your paddock, you can't graze your cows down at Waikato Heads."

Where there is active erosion, John plants fast-growing poplars, as their roots spread rapidly and secure the bank. To enhance the landscape, he has also chosen a variety of species with a range of colours including

oaks, cherries and alders. John doesn't know if his planting adds capital value to the farm but it increases his own satisfaction.

Getting everyone on board with the idea has been an issue for John. The neighbours across the stream have not fenced their side, so John has lost trees to wandering stock. "You also need to have workers who share your interest. If sharemilkers see you're trying to protect their stock, they're more careful with fences and trees."



John Bailey releasing his streamside planting

Finding out *more*

- ✓ For more detailed information about different waterway management approaches, contact your regional council or local **Dexcel** consulting officer. Ask whether a copy of the booklet 'Clean Streams: A guide to managing waterways on farms' is available in your area.
- ✓ For advice about managing weeds and pests in fenced areas, contact your regional council, local pest control contractors or farm supply store. Or check out the NZFEA Trust's 'Practical guide to natural features on farms' - available from the MAF website at www.maf.govt.nz/sff/about-projects/decision-management-and-learning/01059tools.htm or by emailing info@nzfeatrust.org.nz or, for **Federated Farmers** members, call **0800 327 646** to order your copy.
- ✓ To find out more about bridges or culverts to keep stock out of waterways, check out the NZFEA Trust's booklet 'Low Impact Tracks and Races' (available on MAF website, from NZFEA Trust or Federated Farmers as above) or talk to your regional council or local **Dexcel** consulting officer.
- ✓ To find out more about local waterway management initiatives, contact the **New Zealand Landcare Trust** at www.landcare.org.nz and link up with a Landcare group in your area.
- ✓ To find reputable service providers or contractors in your local area, check out www.envirodirect.co.nz

For more information about the NZFEA Trust, contact info@nzfeatrust.org.nz or PO Box 7184, Hamilton East. For more information about the Ballance Farm Environment Awards, contact bfea@bfea.org.nz

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