

Waterlines

RURAL OTAGO'S WATER UPDATE



Spring/Summer 2015



Invermay farm manager Kevin Knowler looks at a stream on the company's deer farm where the removal of sediment has brought about improved water quality with more improvements still to be made.

Pro-active water quality management pays dividends for AgResearch

Staff at AgResearch's Invermay deer farm are tackling longstanding water quality issues on the property.

Not only that, they want to share their experience and their solutions to these problems with farmers to help them comply with the Otago Regional Council's new water quality rules.

AgResearch staff – led by senior scientist Dr Geoff Asher – have set up a deer focus farm managed to a five-year land and environment plan based on a Beef and Lamb New Zealand template.

Dr Asher says this came out of discussions he and farm manager Kevin Knowler had about 18 months ago about integrating deer herds and sheep flocks on the farm, and a subsequent visit at their request by ORC staff to see how water quality measured up against the Otago Water Plan's requirements.

As a follow-up to the ORC visit, Mr Knowler and colleague Dr Jen Robson began a paddock-by-paddock assessment of the deer farm.

This included pinpointing sources of sediment, how far it was being transported and where from; reviewing whether deer grazing blocks were too close to streams, and where to relocate them; assessing the need for new fencing, and considering the extent to which riparian planting was needed to act as a buffer to sediment.

In a comparatively short time, the deer farm's wintering blocks have become compliant with ORC rules and issues with the worst paddocks have been resolved.

Recently, Invermay held a field day for deer farmers, where various presenters discussed pro-active management of water quality on deer farms, including AgResearch staff talking about the progress they'd made with the five-year plan. Mr Knowler and

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This January 2015 photo illustrates the extent of algal growth in the Kakanui estuary.

Nutrient limits hold key to Kakanui algal bloom reduction

ORC is set to continue its work with the North Otago community on curbing algal growth in the Kakanui estuary, and improve water quality in the process.

The council commissioned research by the National Institute of Water and Atmospheric Research (NIWA) to investigate the relationship between water quality, river flows, and nutrient loads in the estuary; and held preliminary meetings with stakeholders.

Prolific algal growth in the lower Kakanui River and the Kakanui Estuary has long been a cause for concern for the local community and for ORC.

Algal growth can harm the fish and buglife in the river. Apart from being unpleasant to look at, it can also spoil people's enjoyment of the water.

The NIWA research concluded that the numerical target for NNN (nitrite-nitrate nitrogen) in the Otago Water Plan is expected to prevent excessive growth of macro-algae in the estuary. The target date for achieving these concentrations is 31 March 2025.

NIWA determined the likely concentrations and distributions of nutrients within the estuary to see if any parts of the estuary are more susceptible to nitrogen coming from the tributaries, and to develop concentration thresholds for algal growth.

NIWA's research and ORC's own monitoring has found the Waiareka Creek contributes large quantities of nutrients to the estuary. Some of the creek's flow is a result of irrigation water released into the creek at times of low flow. (Under their consent, NOIC are required to maintain at least 100 l/sec flow in the creek.)

These nutrient concentrations have increased significantly since 2006, and will continue to increase, unless steps are taken to reduce them, as intensive land use in the area is set to continue.

The NIWA report suggests new nutrient limits set in the Water Plan should restrict the concentration of nutrients entering the Kakanui and Kauru rivers through groundwater which cause algal growth in the lower Kakanui and the Kakanui Estuary to flourish.

NNN currently exceeds the Water Plan limit in both the lower Kakanui and Waiareka Creek, and dissolved reactive phosphorus (DRP) exceeds the limit in Waiareka Creek.

The NIWA research was an outcome of the mediation on the new water quality rules and the resulting Memorandum of Understanding (MOU) between ORC and the North Otago Irrigation Company (NOIC).



Extensive riparian planting in a gully near deer grazing blocks on steep terrain has slowed the movement of sediment on the Invermay deer farm.

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Dr Robson's farm inspection showed that there was far more sediment at the bottom of waterways than they'd appreciated – some of these deposits being the result of land disturbance caused by excavation 20 to 30 years ago.

The need for a whole-of-farm strategy to remedy the urgent sediment issues became readily apparent, one which because of limited budgets would have to be effective and affordable.

Dr Asher said the five-year plan centred on working on the obvious problems to start with and less substantial issues from there on in.

One of Mr Knowler's discoveries during his inspection was that a hole had been dug above a gully about 20 years ago, apparently to try and find a spring for a potential water scheme.

This effectively created about 20 tonnes of sediment that sat in the bottom of the hole.

"The amount of sediment coming out wasn't large, but there was enough to make water discoloured all the time. Now that we have fixed the source by removing the sediment, we just need another wee rain event to flush out the stream and it will be permanently clean," Mr Knowler said.

"It's quite rewarding that within a year we've gone from having water that would never be clean, to water that is crystal clear in many places," he said.

Having accepted the scale of the historic sediment problem, and acknowledging that grazing deer in paddocks with streams created wallows and pugged streambanks, Mr Knowler decided to shift the deer into fenced paddocks well away from waterways.

Dr Asher said replacing the deer with sheep in these more vulnerable paddocks made sense because, unlike deer, sheep won't gravitate to water and boggy areas. However, simply moving deer further away from a paddock near a waterway won't curb their natural inclination to create wallows.

"As soon as you fix one up, they'll create another one – so we've created safe wallows by digging out land areas which don't connect to watercourses," Dr Asher said.

Stressed deer react to confinement by fence-pacing, creating tracks around fences, which on a steep paddock, provides a perfect conduit for sediment to travel downhill.

"One of the best ways to prevent that is to feed your deer well, because otherwise, as soon as their feed gets tight, and they get bored and they're looking for feed, they start traipsing around, which is when the fence-pacing starts," Dr Asher said.

"The need for a whole of farm strategy to remedy the urgent sediment issues became readily apparent, one which because of limited budgets would have to be effective and affordable."

The key now for the rest of the five-year plan and beyond is to manage the stock to look after good water quality, part of which will involve an ongoing fencing programme.

ORC community education and liaison manager Nicola McGrouther, a member of the deer focus farm governance group, said that once AgResearch had recognised the water quality issues, Mr Knowler was pro-active at changing management practices around waterways.

"It has been heartening to see such a focus on checking waterways, their readiness to make positive changes quickly, and them taking such pride in delivering good water quality," Mrs McGrouther said.



Photo: Chris Pascoe.

Wilding conifers grow prolifically in Central Otago and elsewhere in the region, as this photo taken near Alexandra shows, prompting ORC to ask the community for its views on whether the council should be involved in a regulatory role with wilding control, contribute financially to this control, or both.

ORC promoting informed community debate on wilding conifer management

Growing concern about the spread of wilding conifers in Otago has prompted ORC to seek the community's view about regional management of the pest tree.

ORC chairman Stephen Woodhead said the council was aware of community concern about wildings.

Recent reports had identified that more than 300,000ha of Otago has some wilding infestation, particularly in Central Otago and the Wakatipu, with this figure likely to treble in the next 20 years if nothing further is done to increase wilding management.

"This has clarified the scale of the spread and reinforced the need for a coordinated approach, regionally and nationally, while the issue is still at a manageable level," Mr Woodhead said.

The council has launched an online survey (go to www.orc.govt.nz) which will be available for completion until early in the New Year.

The survey is designed to clarify how concerned people are about the spread of wilding conifers, the impacts they are most concerned about, and gauge community views about ORC potentially

supporting existing community wilding control groups.

Proposals for how the council could appropriately assist with wilding management will be included in ORC's draft 2016/17 Annual Plan for public consultation.

Wilding conifers take up significant amounts of soil moisture and degrade landscape and scenic values important to many people in Otago. Their spread also has ramifications for pastoral productivity.

Mr Woodhead applauded the work many community groups, such as the Wakatipu Wilding Conifer Control Group, are doing to control these trees.

"These groups know a lot about this problem and have been very active with control programmes, but the problem is widespread and beyond the means of any single group," he said.

"We want to help raise public awareness of the extent of the wilding spread and of the consequences of leaving it

unchecked, so that people understand the seriousness of the problem."

"We have already discussed the issue with district council mayors and executives, and key stakeholder groups," Mr Woodhead said.

"We will be considering whether the council should be involved in a regulatory role with wilding control, contribute financially to this control, or a combination of both," he said.

The release of a NZ Wilding Conifer Management Strategy, the recent launch of the National Policy Direction for Pest Management, and the forthcoming review of the Otago Regional Pest Plan, all meant the timing was right for the council to consult the public and consider the options available, Mr Woodhead said.

"We also look forward to the Government providing funding in support of its own obligations to deal with legacy plants on Crown land, on the conservation estate, and on other Crown land," he said.



This Maniototo property was affected by last summer's drought in Otago. ORC is on standby this summer to respond if predictions of dry weather conditions for the region come to pass, affecting waterways.



The Kye Burn is among several places in Otago where river flows are at similar levels to this time last year when flow conditions were a sign of the big dry to come.

El Nino may persist through Otago summer

El Niño conditions are predicted to continue in the tropical Pacific at least through the summer of 2015/16.

This is predicted to result in an elevated risk of dry weather conditions similar to those experienced in 2014/15.

ORC resource scientists are currently advising council's low flow management team on the potential effects of dry weather conditions on Otago waterways. Staff will be contacting water users and stakeholders in due course should the predictions begin to eventuate.

NIWA says the average summer rainfall amounts recorded during the three strongest El Nino events since 1950 (1972-73, 1982-83, 1997-98) point to an elevated risk for drought later during the 2015-16 summer, particularly for eastern parts of both islands as well as northern areas of the North Island.

River flows have been at similar levels to the same time last year at several sites in North Otago (including the Kye Burn), suggesting that flow conditions this summer have the potential to be similar, or lower than experienced last year.

NIWA says international guidance suggests El Nino is tracking close to the 1997-98 El Nino (the strongest since 1950) and is expected to intensify further over the next three months.



A healthy buffer between a paddock and a stream as in this picture helps prevent sediment runoff entering the waterway.

Buffer zones recommended for wintering paddocks

ORC is advising farmers cultivating paddocks for winter greenfeed crops to leave a buffer zone on areas bordering any waterway.

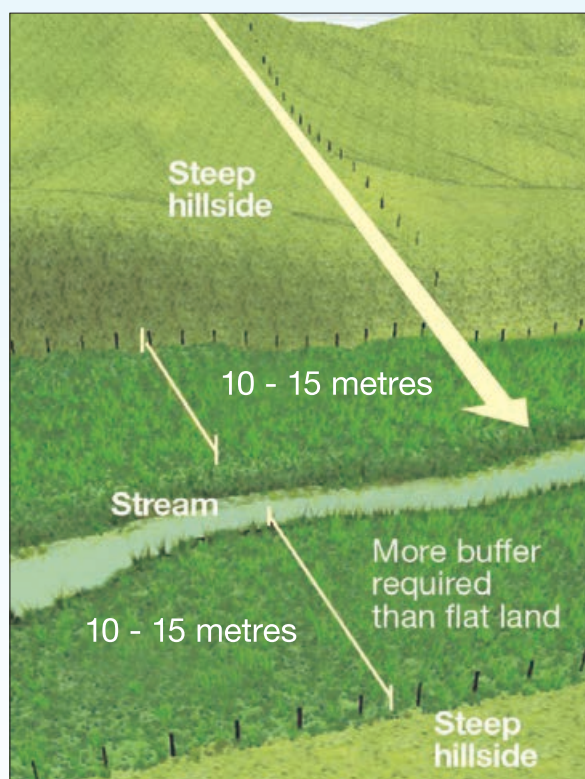
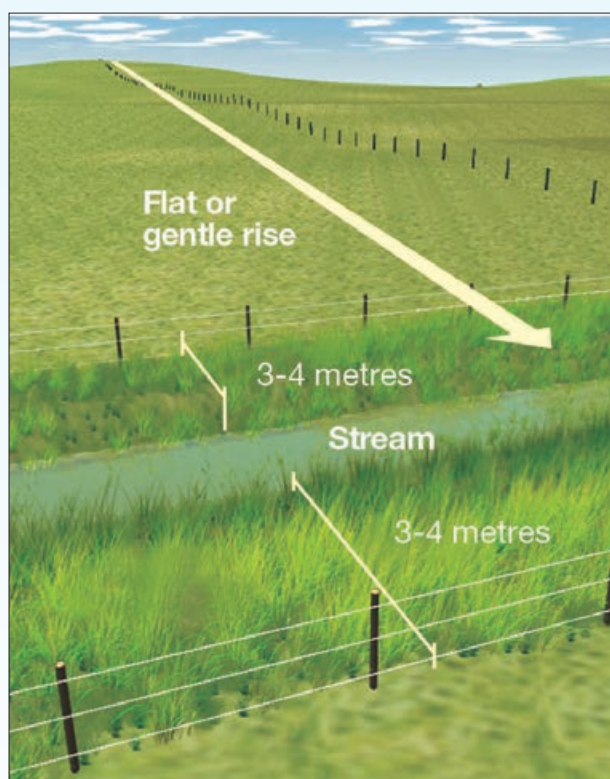
The Otago water quality rules require that measures be put in place when disturbing land to control sediment runoff into waterways.

ORC manager community liaison and education Nicola McGrouther said where there is no filtering margin such as rank grass, rainfall and its resultant runoff over grazed paddocks readily transports sediment and contaminants into waterways. This can result in the loss of valuable topsoil, as well as increasing levels of nutrients, bacteria, and pathogens polluting streams and rivers.

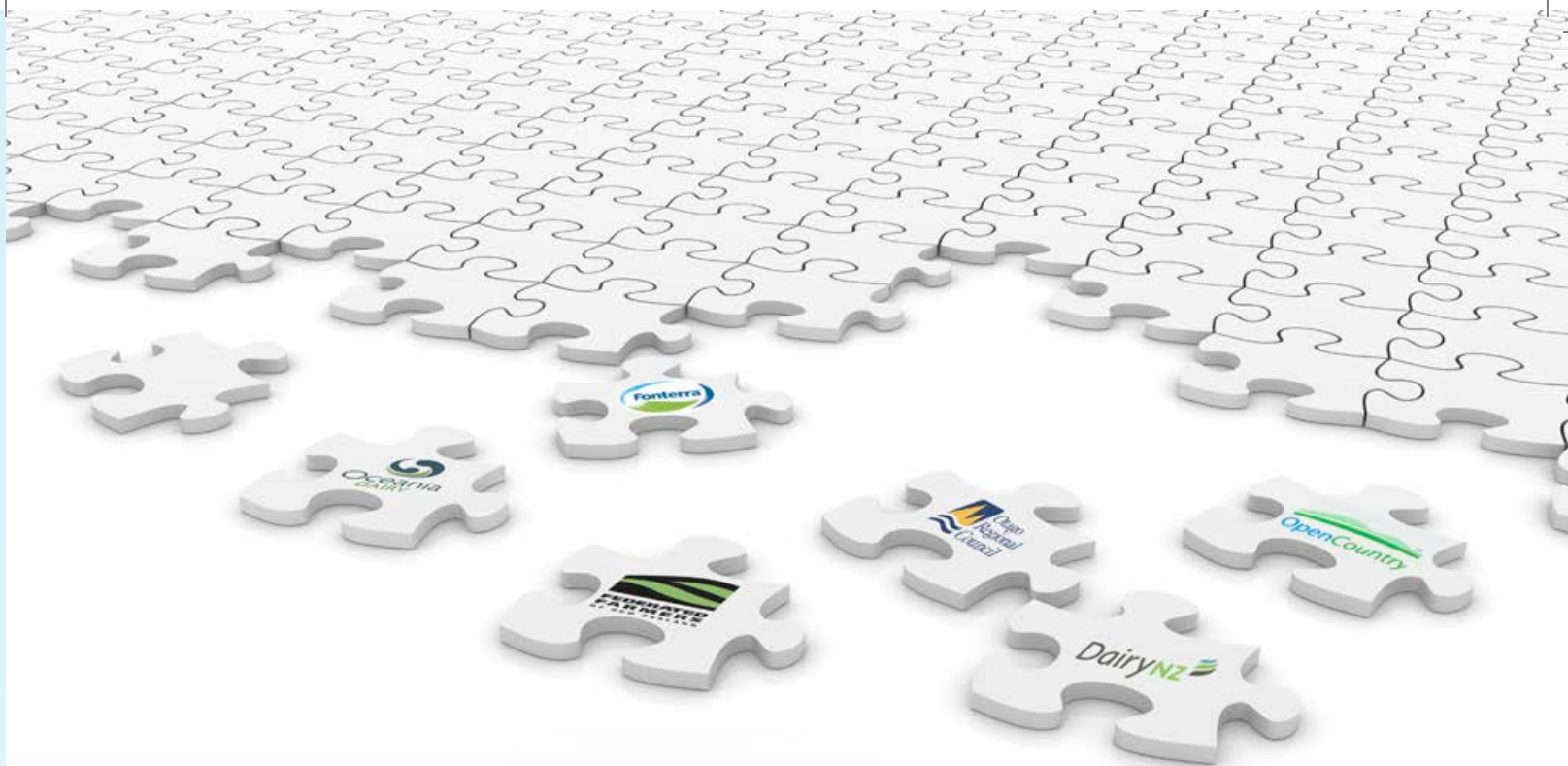
A buffer zone of long grasses, fenced off with electric fences and left ungrazed, provides an effective trap within the paddock to maintain water quality during subsequent winter grazing.

A farmer needs to decide how much of a buffer is needed to be effective at minimising sediment runoff. This can depend on slope, contours, soil, and buffer vegetation. But to start with, a buffer of at least 3-4m is recommended for flat land, while steeper land will need a considerably larger buffer – to trap animal waste and sediment runoff.

Keeping an eye on farm waterways while the land was bare was important to ensure the buffer was effective. Plumes of sediment in the nearby waterway showed something was wrong and farmers should then step in and fix it, Mrs McGrouther said.



Industry guidelines suggest that on flat land, a buffer of around 3-4 metres would normally be enough (above left), while steeper land will require a much larger buffer - sometimes of about 10-15m or more (above right).



Agencies and ORC work together on water quality guidance

An industry-wide collaborative approach to helping dairy farmers meet ORC's water quality standards is under way in Otago.

ORC recently hosted a meeting of southern dairy industry representatives where the best ways of providing guidance to landholders that the council has identified as being at risk of non-compliance in matters such as effluent runoff and ponding were discussed.

The dairy industry group includes representatives of ORC, Federated Farmers, DairyNZ, and dairy companies Fonterra, Oceania, and Open Country.

ORC chief executive Peter Bodeker said the external agencies which make up the dairy industry group had a valuable support role to play in helping farmers meet their Otago Water Plan obligations.

Mr Bodeker said working together as a team was always going to be the best way to make sure Otago rivers are up to standard and provides a win-win for everyone.

ORC is involved in similar collaborative work on water quality with the sheep, beef, and forestry industries.

The dairy industry representatives were prepared to work with individual landholders to provide support and advice, he said.

It was in the industry's interests to ensure that they enhance their product reputation and status by ensuring farmers continue to implement environmentally sustainable practices.

However, ultimate responsibility for monitoring compliance with water quality remained ORC's – field staff would continue to be active in both educative and compliance inspections and where significant breaches occurred, offenders were liable for enforcement action, Mr Bodeker said.





Photo: ODT.

Guardians of Lake Dunstan chairman Andrew Burton (left) and John Wilson, of Cromwell, with handfuls of lagarosiphon scooped up earlier this year.

Lagarosiphon control works progressing

ORC monitors high risk areas of Central Otago such as Lake Dunstan, Lake Wanaka, and the Kawarau River, where infestations of the lake weed lagarosiphon are prevalent.

Lagarosiphon chokes waterways, making swimming unpleasant and fishing and boating difficult.

The control of lagarosiphon is included in ORC's pest management strategy. Land Information New Zealand is responsible for its control in Crown-owned lakes and riverbeds.

Current control techniques for lagarosiphon in Lake Wanaka are working well and more of the lake is becoming free of the plant pest.

Lake Dunstan and the Kawarau River are being considered by the management agencies for control works before the busy summer holiday season – the Kawarau because lagarosiphon can potentially spread into Lake Wakatipu. Inspections will continue over the summer in Lake Wakatipu, in particular the Frankton Arm, to ensure lagarosiphon has not established.

Meanwhile, following the formation in June of an aquatic weed management group for Lake Dunstan, a new 10-year lagarosiphon control strategy is to be

drafted by Mary de Winton, a freshwater ecologist from NIWA.

The stakeholders in the group, headed by LINZ, include the Central Otago District Council, ORC, Contact Energy, Fish and Game, Clutha Fisheries Trust, Cromwell and Districts Community Trust, and the recently established Lake Dunstan Guardians group.

The long-term plan for Lake Dunstan includes a list of priority sites and preferred methods of controlling the weed, including spraying, and mechanical options such as mulching, suction dredging, and hand weeding. Other mechanical options are also being considered as part of the plan.

This comes as a second 10-year plan is also being developed by the Lake Wanaka Lagarosiphon Management Committee.

Two-thirds of Lake Wanaka has been cleared of the weed since the first 10-year plan was established in 2005.

