

Kaikōura Plains Recovery Project

Critical source areas and overland flow paths

Managing them on your property

Following the 2016 North Canterbury earthquake a study was undertaken to assess the damage, habitat and health of the streams in the Lyell Creek/Waikōau catchment.

Several critical source areas (CSA) were identified during the study including newly created springs, bank slumping, erosion and 104 overland flow paths (OLFPs).

Helping landowners find ways to manage these CSAs became a key focus for Kaikōura Plains Recovery Project (KPRP).

What are CSAs?

CSAs are the likes of pugged areas, raceways, stock crossings and springs. They carry sediment and nutrients into waterways and put the quality of freshwater ecosystems at risk.

OLFPs are a major form of CSAs, often forming in low-lying parts of farms such as gullies and naturally low/hollow places, where runoff accumulates. This runoff is then carried into nearby waterways or wetlands.



Overland flow path - a critical source area for sediment and nutrient runoff into adjacent waterways

Why are CSAs a problem on-farm?

CSAs contribute high levels of contaminants like nitrogen, phosphorus, and sediment to waterways, which impacts on the water clarity, quality, and freshwater biodiversity values.

By managing CSAs well, sediment and nutrient loss can be reduced and water quality improved. It also helps landowners to meet Good Management Practices (GMP) and the conditions of their Farm Environment Plan (FEPs).

How to manage CSAs

Widening riparian buffer strips (the areas of vegetation surrounding waterbodies) filters contaminants from water before it flows into adjacent waterways.

Fencing the area off to keep stock out is a great first step. This will help the area to regenerate and filter contaminants, and can also help to:

- stabilise banks
- reduce erosion/bank collapse
- enhance biodiversity and mahinga kai values, and
- provide habitat for wading birds and other native species.

Get in touch with your local Environment Canterbury Zone Team for advice on methods and to see if there's any assistance available.

Test your water for contaminants (nitrate, phosphate, sediment and E. coli) to see what issues may need addressing. Testing monthly for at least 12 months will give a solid picture of what is happening on your site.

Meeting the regulations by managing your OLFPs and CSAs is great for your FEP and Farm Audit. Keep a record of your plan, how you went about it, the costs, and take plenty of photos.

Consider staging your approach when planning - it does not need to happen all at once.

KPRP worked with Environment Canterbury and local landowners to demonstrate how simple interventions such as fencing and planting could reduce runoff and improve CSAs on-farm.

Keep reading to see two management methods used.

Approach: minimal intervention

<p>Location and size</p>	<p>Montegues wetland, Rorrison's Road. Critical source area of 1,845m².</p> 
<p>Farm type</p>	<p>Small sheep and beef farm, with a dairy grazing lease</p>
<p>Issue</p>	<p>Overland flow path identified, running alongside Warrens Creek, which then flows into Lyell Creek/Waikōau</p>
<p>Level of vegetation before intervention</p>	<ul style="list-style-type: none"> • Willows • cutty grass (native - <i>Carex geminata</i>) • large leafed pohuehue • garden species (a climbing rose, flowering bulb species) • creeping buttercup • various pasture species.
<p>Actions undertaken</p>	<ul style="list-style-type: none"> • Stock removed and area fenced off (stile built over fence for easy foot access) • willows poisoned October 2018 • water testing carried out summer 2019/2020 – inadequate testing available due to drought conditions.
<p>Outcomes</p>	<p>Cutty grass regeneration began immediately following fencing and was abundant within 12 months, increasing in cover in the spring and summer months, providing good filtration. Drought conditions resulted in unsatisfactory water results, so additional planting has not been carried out to date (October 2020).</p> <p>Keeping stock out has unfortunately been a challenge, however this has improved with additional and upgraded fencing.</p> <p>The climbing rose and flowering bulb garden species are to be removed.</p> <p>The site will also receive some 'in-filling' of suitable native species to provide biodiversity benefits and increasing aesthetic value for the landowner and neighbouring community.</p>



Montegues wetland before minimal intervention



Montegues wetland after intervention with riparian buffer strip providing filtration

Approach: higher level of intervention (still simple)

<p>Location and size</p>	<p>Maghera Farm and Lyell Creek/Waikōau OLFP remediation, Mt Fyffe Road. Critical source area of 3,800m². Area includes the riparian margin that was already fenced off and additional area that was identified for better riparian management.</p> 
<p>Farm type</p>	<p>Dairy farm</p>
<p>Issue</p>	<p>The site is an OLFP remediation site which takes in 12 CSAs, so is one of the most concentrated areas located during the stream walk. It sits alongside 507 linear metres of spring-fed stream, flowing into Lyell Creek/Waikōau.</p>
<p>Level of vegetation before intervention</p>	<ul style="list-style-type: none"> • Poplar trees • cutty grass (native - <i>Carex geminata</i>) • creeping buttercup • various pasture species.
<p>Actions undertaken</p>	<ul style="list-style-type: none"> • Fenced 615 linear metres • planted 500 sedges, shrubs, and trees (all eco-sourced native species) • filter strip of low vegetation retained on the outside of taller plant species • volunteer planting day with Environment Canterbury and Fonterra • to date, around \$7,400 of funding has been received from Environment Canterbury for 'on-the-ground actions for freshwater', as recommended by Kaikōura Water Zone Committee. Funding used for fencing, plants and plant guards.
<p>Outcomes</p>	<p>A targeted approach to reducing CSAs was possible here thanks to the great tools available in the Lyell Creek/Waikōau catchment recovery recommendations report by NIWA, and additional stream walk data.</p> <p>The targeted and simple actions undertaken will improve freshwater quality in time, with only a small amount of pasture repurposed for filtration purposes.</p>



Maghera Farm before intervention



Maghera Farm after intervention

This work is part of Ministry for Primary Industries funded Kaikōura Plains Recovery Project (2017-2020). For more information on the project, please go to www.ecan.govt.nz/kaikoura-plains-recovery-project or visit your local Environment Canterbury office.