



# Reducing the impacts of winter grazing on soil and water quality

## Do you know your critical source areas?

Critical source areas (CSAs) are vulnerable areas of a farm that can contribute high amounts of sediment, nutrients and bacteria to streams. CSAs are often persistently wet and include gullies, swales and seeps. It is also where treading damage and overland runoff is most likely to occur.

Even small changes in management of these areas, especially in the winter, can result in major reductions in the impacts on soil and water quality.

## Key messages

Soil compaction and pugging can cause:

- It's not just about winter – sediment and nutrient loss may occur in other seasons with intense rainfall.
- Protecting CSAs allows rainfall and runoff to infiltrate the soil, reducing contaminants to streams.
- Strategic grazing and fencing of riparian areas and CSAs can greatly improve water quality.
- Simple grazing changes, such as grazing from the top of the slope, can also greatly improve water quality.

## How does winter grazing affect soil?

During wet winter conditions, soil can become more susceptible to compaction and pugging. Soil compaction and pugging results in:

- An increase in weeds, water logging and greenhouse gas emissions
- Increased surface runoff causing soil loss and an increase in sediment, nitrogen, phosphorus and bacteria to streams
- Degradation of soil structure.

Research by AgResearch shows that current practice of cattle grazing on winter forage crops makes soil more compact, but that this can be lessened by using back-fencing.

Other research by Plant and Food shows that forage crop establishment by direct drilling helps reduce soil compaction, which in turn helps reduce nitrous oxide (a greenhouse gas) emissions.

## How does winter grazing affect water quality?

Winter forage grazing on slopes can cause an increase in sediment, nutrient and bacteria in surface runoff, especially in CSAs.

Research by AgResearch on the Otago Telford farm shows strategic grazing from the top of the slope, protecting CSAs and back-fencing every 4-5 days reduced sediment and nutrient loads up to 90%!

Other research by AgResearch shows that 'cleaning-up' in a CSA or fenced riparian area by a few cattle resulted in increased phosphorus in water, possibly via dung deposition.

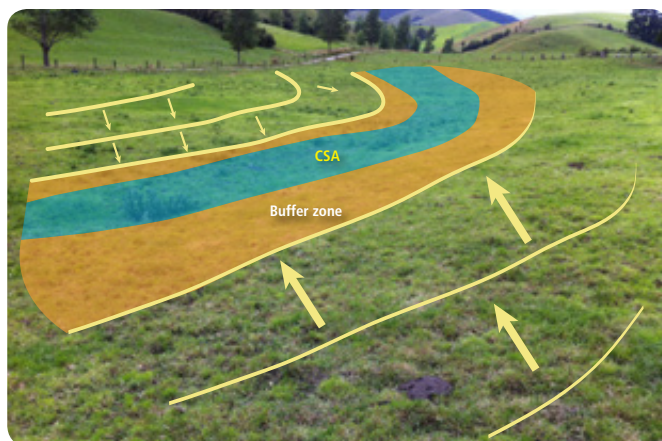


Figure 1: Strategic grazing around a CSA – graze or break feed from the top to the bottom of the slope and avoid grazing in CSAs altogether. If this is not practical graze CSAs lightly and for a shorter time

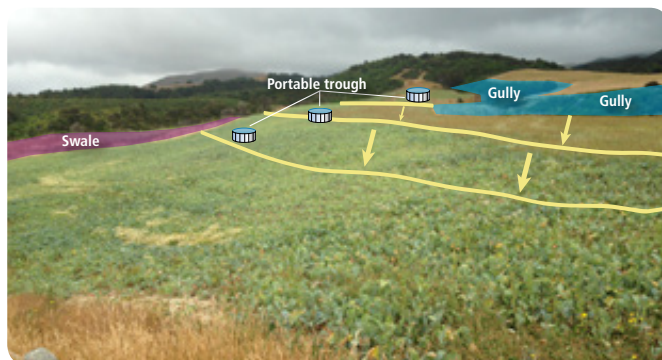


Figure 2: For best practice grazing on a forage crop break feed from the top to the bottom of the slope, and lay supplementary feed out before the ground gets too wet. Gullies should be left uncleared and fenced to exclude stock, and swales should be left uncultivated and not grazed

## Management tips for reducing the impacts of winter grazing

1. Leave gullies vegetated and fence them off. This also helps reduce erosion from treading.
2. Cultivate with the contour of the land (not up and down) to minimise topsoil losses.
3. Direct drilling enables better timing of crop establishment and reduces greenhouse gas emissions.
4. Strategic grazing and fencing riparian areas and CSAs can greatly improve water quality. Even simple grazing changes (such as grazing from the top of the slope) can result in vast improvements (refer figures 1 and 2).
5. Start grazing in less risky areas, ie, the top of the slope and then work your way down. Grazing from the top of slopes means that the time a grazed and pugged area is left adjacent to waterways is greatly reduced.
6. Try to avoid grazing in CSAs altogether. If this is not practical, graze these areas lightly and for a shorter time.
7. Consider not sowing forage crops right next to streams, then they are protected with a buffer of grass. A buffer of at least 5-10 metres is optimal for protecting water quality.
8. Avoid break feeding through waterways or swales.
9. Consider using portable water troughs when back-fencing.
10. Back-fencing where practical helps reduce soil damage and stirring up of soil, especially in CSAs.

## Our responsibilities

As a regional council, it's our role to look after the environment in our region. Revisions to the regional plan contain rules which may affect your winter grazing practices. If you have any questions about rules for activities near waterways, contact a Consents Officer at [info@gw.govt.nz](mailto:info@gw.govt.nz) or 0800 496 734.

For more information on the regional plan review go to [www.gw.govt.nz/regional-plan-review](http://www.gw.govt.nz/regional-plan-review).

For more information on soil and water quality, please contact us at [environmentalscience@gw.govt.nz](mailto:environmentalscience@gw.govt.nz) or see [www.gw.govt.nz/environmental-science](http://www.gw.govt.nz/environmental-science).

For more information on sustainable farming practices, contact the Wellington Regional Council:

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