Critical source areas

Intensive Winter Grazing

The National Environmental Standard for Freshwater has particular rules about intensive winter grazing through critical source areas.

The full details for the rules about intensive winter grazing please see the fact sheet Critical Source Area Management.

Critical Source Area Management

Critical Source Areas (CSAs) are overland flow paths that can accumulate and convey water (and contaminants) to waterways.

CSAs are common on farms, and it's important to identify and manage them, particularly those located on hilly, rolling and undulating land.

Identifying a Critical Source Area

CSAs are landscape features such as gullies, swales or depressions that accumulate runoff from adjacent areas and deliver it to surface waterways (streams, rivers, lakes and wetlands).

Sometimes they are very small and subtle, others are large and obvious.

The marked area above is a critical source area.

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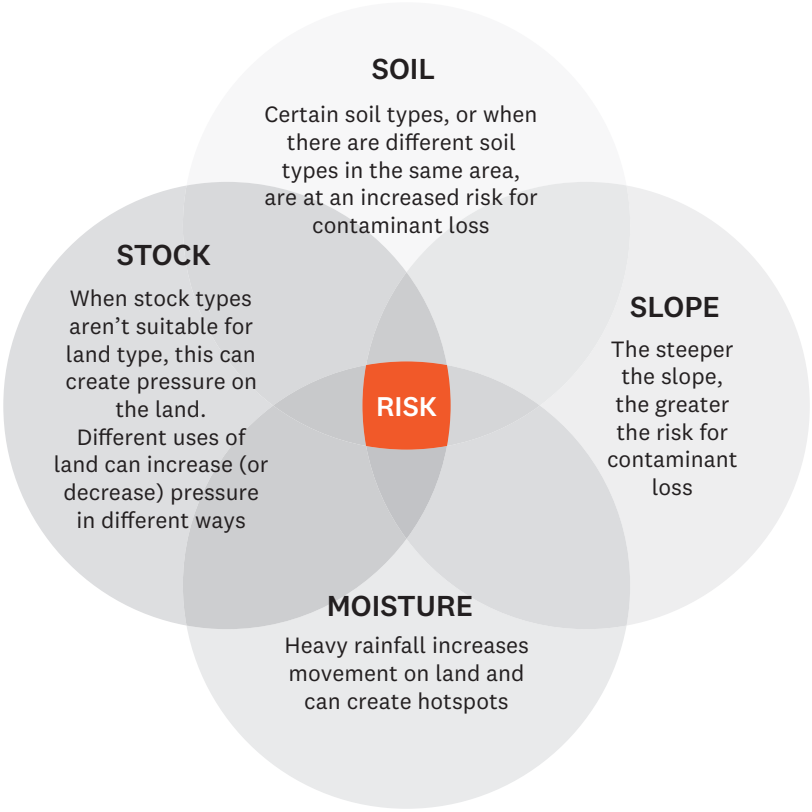
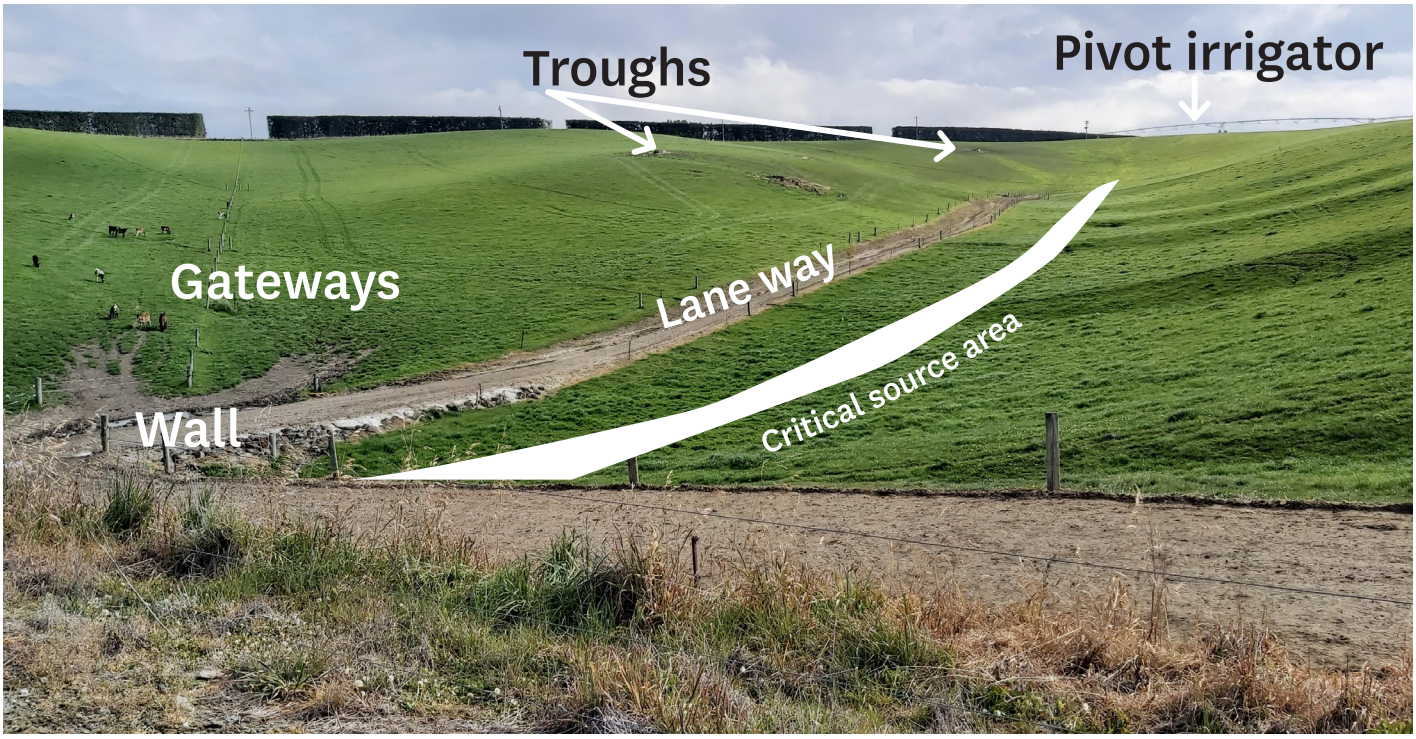
Risk factors

It is important to plan and prepare ahead to ensure CSAs are managed well. There are a number of factors to consider, as shown in the diagram below.

In Otago, the highest risks for transport of contaminants to waterways via CSAs are when:

- intensive winter crop grazing or intensive grazing on pasture, is undertaken within, or close to, a CSA
- a CSA is de-vegetated and there is no soil armour to stop erosion or contaminant run off (for example during heavy or sudden rain).
- there is proximity of infrastructure to CSAs, for example tracks, lanes, gateways and supplementary feeding areas.
- sub-surface drainage results in the fast tracking of nutrients to waterways. For example, a previously wet swale or a CSA that has been tiled.





This image shows a CSA that has some risks that need good management.

Good management practices

Good management of CSAs has been shown to significantly reduce the amount of sediment, bacteria and phosphorus getting into waterways.

These contaminants can negatively impact water clarity and quality, and reduce freshwater biodiversity.

Have a look at the critical source areas on your farm:

- Are they steep or do they have a low gradient?
- Do they drain a large or small catchment?
- Does the soil drain freely or is there extensive soil moisture?
- What good practice can be used to ensure that the water at the bottom is free of sediment and nutrients?

During cultivation

- Cultivation for annual forage crop for intensive winter grazing in a critical source area will need a resource consent.
- Use minimum tillage where possible.
- CSAs should be left uncultivated and in grass.
- The steeper the slope leading to the CSA, the wider the buffer required.
- Plough across slopes. Be careful the “plough line” around CSAs doesn’t funnel runoff around the buffer. Ideally remove this shoulder so that water runs into the swale evenly.
- Buffer areas help to slow down water movement, allowing time for contaminants like sediment to be removed from suspension.

The bottom of this CSA has been left in grass.

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Remember: STOP, SLOW, (SOAK), TRAP

STOP contaminants getting to water through cultivation and strategic grazing techniques

SLOW down the movement of water in CSAs using grassy buffers.

Slower water movement allows time for water to SOAK into the soil profile

TRAP sediment using grass buffers, sediment traps and sediment cloth

Intensive winter grazing

- Intensive winter grazing though a critical source area will need a resource consent
- Strategically graze the paddock to reduce the likelihood of sediment making its way to water.
- Consider starting at the top of slopes, back fencing as you go, and leaving CSAs ungrazed.

Fencing and planting

Fence stock out of steep or eroded areas or CSAs. Plants will act as a filter by removing contaminants and slowing down the water. This maximises the infiltration rate of rain and allows sediment to drop from suspension.

If it's wet enough, plant wetland species such as carex, toitoi, or flax as they are good at extracting nutrients. Remember, if the critical source area is transitioning to a stream, river, drain or wetland, there are requirements for stock exclusion buffers. These rules are can be found in the stock exclusion fact sheet https://environment.govt.nz/publications/essential-freshwater-stock-exclusion-factsheet/

Sediment traps

These allow any sediment (soil) and associated nutrients and bacteria to drop from water. These are best when they are small in size and used frequently (there could be several used along one CSA).

Other good management opportunities

- Where possible, keep high-traffic areas such as gateways and troughs away from CSAs.
- Know where your sub-surface drains are so that you can manage any potential leachate reaching waterways, for example low stocking rates, and not intensively grazing during wet periods.
- Ensure that leachate from silage pits is captured, and think about capacity to ensure no contaminants are lost to waterways.
- Manage stock traffic to prevent soil compaction.
- Camber lanes so runoff is evenly distributed into the paddock. Cut-outs on tracks or laneways will help distribute water evenly and will prevent it accumulating at one point.
- Use variable rate irrigation as this helps ensure that lanes, gateways and the middle of CSAs are not irrigated.
- Walk your waterways and observe where contaminants may be coming from (e.g. an untidy gateway needing rocking, a stock crossing that requires a culvert). This will help you identify risk areas.
- Develop a site prioritisation and action plan to ensure the highest risk areas are addressed first. Include this information in your Farm Environment Plan.

A Catchment Advisor can help you identify CSAs and advise how to manage them.
To arrange a free visit please call **0800 474 082** or email us on **catchments@orc.govt.nz**