



Sediment trap guidelines

Sediment traps are a low-cost, practical way to help minimise sediment entering waterways. The handy guidelines in this information sheet can help turn these useful tools from a pipe dream into a reality.

A key objective of the Toitū Te Hākapupu / Pleasant River Restoration Project is to improve water quality and related conservation values within Te Hākapupu / Pleasant River catchment. Sediment buildup in streams and estuaries damages the aquatic environment by smothering the bed of the water body. It reduces water clarity and the levels of dissolved oxygen. It can also enable weedy vegetation buildup and choke waterways. Reducing sediment in the catchment's waterways and estuary is important for improved water quality. Sediment traps can help with this.

What is a sediment trap?

Sediment traps are constructed ponding areas in a waterway. They are designed to slow water flow, which allows sediment (silt, sand, and gravel) to settle out of the water on the floor of the trap. The traps can be formed through excavating the bed of a watercourse or drainage channel, or by constructing an embankment.

Where to place sediment traps

Sediment traps are best located where a lot of sediment is expected or already evident. For example, where the soil is vulnerable to erosion, beside roads, holding pens for livestock, or below areas of active erosion. When they are added to small waterways and drains they can reduce sediment input to the wider river system downstream.

A sediment trap requires maintenance to be effective. Choosing a site with easy access for regular emptying with an excavator is important.

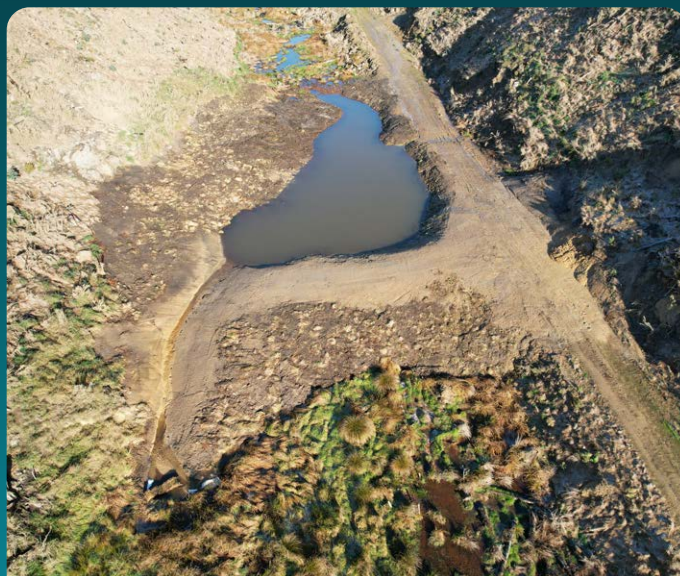


Figure 1. Example of a sediment trap with meander on the inlet and the outlet offset allowing maximum water retention time within the sediment trap.

Shape

Sediment traps are usually relatively deep, often with a width to length ratio of 1:5–1:10. This allows the water to slow and the sediment to settle. They are usually at least 1.5 metres deep, but this can depend on the site. Generally, deeper traps provide a longer water retention time, so they capture more sediment and finer particle sizes.

Offsetting the inlet from the outlet and creating a meander away from the natural flow path of the waterway can help further slow water velocity (**Figure 1**).



Figure 2. Example of a sediment trap recently constructed in East Otago.



Figure 3. Example of a simple sediment trap that requires maintenance, located next to a paddock used the previous winter for grazing livestock.

Size

The best size for a sediment trap depends on many factors. These include the size of the catchment area plus the topography, vegetation, and intensity of rainfall events in the area. All these factors influence the volume of water passing through the sediment trap.

A site analysis is needed to work out the best size, design, and number of traps required. If the total size cannot be achieved at a single site, multiple traps in succession may be an alternative, for example, through a gully or within a sub-catchment.

Sometimes the trap may be a significant undertaking (**Figure 1**) and may offer an opportunity to include plantings (**Figure 2**) or link to other riparian enhancements to support biodiversity and reduce sediment mobilisation. Other times, traps may be smaller, simpler and temporary to help reduce sediment loss from temporary soil disturbance, such as winter grazing (**Figure 3**). While these temporary options may not offer the same additional environmental enhancement opportunities as permanent traps, they can still perform the important task of capturing sediment in the short term.

Maintenance

Sediment traps need to be checked and maintained

regularly to ensure they work to their full potential (**Figure 3**). Once full, they need to be emptied with an excavator. They are best emptied during dry periods and prior to periods when heavy rainfall is likely.

Rules

The Otago Regional Council's Regional Water Plan allows the construction of sediment traps in ephemeral or intermittently flowing water bodies as a permitted activity, as long as certain conditions can be followed (see Rule 13.5.1.10). If a sediment trap is required in a permanently flowing waterway, a resource consent is likely to be required.

To discuss this further, or check your particular situation, talk to your local Otago Regional Council catchment advisor.



Catchment
advisors:
bit.ly/4fyxDtB



More information:
bit.ly/4gE3G5T

Making a decision

A sediment trap can be an effective tool to help reduce sediment in waterways. Careful consideration of the points covered in this info sheet will help get the right type of trap in the right place.

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