



SEDIMENT MITIGATION

WHAT IS SEDIMENT AND WHY IS IT A PROBLEM?

Sediments are a natural part of a stream, lake, or river, and the type and amount found in streams are influenced by the geology of the surrounding area.

As erosion occurs, tiny particles of clay, silt or small organic particles are washed into waterways. These tiny particles can be supported in the water current and are termed suspended sediment. The faster the water is moving the larger the amount and size of suspended sediment particles it can carry. At times, this sediment settles on stream beds and when this occurs this is referred to as deposited sediment.

Deposited fine sediment refers to fine particles of inorganic matter less than 2mm that flow into and sometimes settle in our waterways and ocean.

Sediment can reduce water quality, effecting how fish, birds and bugs live and feed. It can settle in streams, rivers, lakes and estuaries, changing the natural environment and animal habitats. Sediment has contributed to the growth of mudflats, covering shellfish colonies and driving mangrove expansion. It also impacts marine plants and fish survival as it washes into the ocean during heavy rain flows.

Sediment build up can obstruct water channels, reduce drainage and possibly cause flooding. It also affects the availability of water for stock water, domestic supply and irrigation.

Sediment can carry minerals and contaminants with it, washing away productive soils and having an impact on our waterways at the same time. Contaminants include heavy metals, organic contaminants and pathogens, such as E. coli, which can harm human health. Phosphorus binds to sediment particles and can cause excessive algal growth in waterways. This,

in turn, depletes the oxygen available for fish and bugs.

Sediment can develop fast, but rivers and estuaries can take a long time to recover from it. Although erosion and sedimentation are natural processes, natural rates of these processes can be exacerbated by human impacts. Because there are many associated negative impacts of high sediment levels one of the best options is to reduce sediment entering water in the first place.

Look for soil erosion on your properties. Sources can be:

- stream banks,
- in drains,
- from rain on bare land (especially pugged, cultivated land or heavily grazed land, house building and development)
- from soil blown during cultivation
- from topsoil from hill slopes gradually and suddenly in slip events

Preventing soil erosion control depends on three principles:

- Reducing the potential of water and wind to cause erosion by stopping water getting into the soil surface
- removing water safely from soil surfaces
- reducing water and wind speed



MITIGATION STRATEGIES

Implement the good management practices for erosion mentioned in your poster and in the section on erosion. Also consider the mitigation strategies outlined below.

Sediment Trap/Pond

A sediment trap is an area where the runoff from land will collect and settle for sufficient time to allow any sediment particles in suspension to drop out and be trapped in the trap before the water drains away through an overflow or spill way. **Any measure that spreads water out and slows down the flow, will allow sediments to drop out, such as sediment ponds, bunds or swales.** Small ponds are formed by excavation into the ground or by the construction of an embankment. They are designed so water leaves at a slow rate, allowing suspended sediment to settle out. Drains can and do catch sediment. Sections of a drain can be engineered as a small pond to increase the amount of sediment that they collect. Sediment may need to be removed as it builds up and placed somewhere it can't return to the waterway. Providing a grass buffer around the pond will filter out the sediments as they flow in.



Video: <https://www.youtube.com/watch?v=-NFigwAfZq8>

Sediment Bunds

Sediment bunds are contoured dam-like structures with small outflow pipes and overflow paths that capture rainwater into small ponds, helping to hold the nutrients in and on the land. Small bunds are relatively easy to build with a digger and can be built as a series down a gully, capturing water and overflowing into the next bund. They can also be engineered and constructed to hold large amounts of water from multiple hectares of land. When bunds are not holding water, they can be grazed.

Swales

Swales are relatively flat grassed areas with gently sloping sides and a gentle longitudinal slope. They are generally used to transport runoff following a heavy rain. Swales can help mitigate sediment loss, as when water flows through them, the grass in the bottom of the swale acts as a filter to remove sediment.



Wetlands

Preserving and constructing wetlands are a way to mitigate sediment flowing off the land. Wetlands act as a sponge that traps sediment, while the wetland plants absorb nutrients and contaminants. We can protect the existing wetlands on our properties by fencing them off, managing pest plants and animals and ensuring the water is not drained away. Constructing new wetlands has multiple benefits and could be funded by Council in your region. QE11 Trust can support you to legally protect your wetland.

Riparian Planting

Plants are another solution to the problem of sedimentation. Sediment is captured by the plant roots and the organic matter that lies under the tree. A 3-10m riparian zone of riparian planting along waterways has shown to dramatically reduce sediment.

Grass Buffers

Create a buffer zone of long grass from 5 to 10 m width to filter overland flow of sediments to waterways. Buffer zones along the bottom of sloping paddocks can obstruct sediment as it flows downhill. Grass buffers are especially important in cultivated paddocks or intensively strip grazed paddocks to prevent sediment washing off the paddock and into waterways.

Helpful resources

<https://www.landcare.org.nz/file/sediment-trap-factsheet-2015/open>

<https://www.rotoruafarmers.org.nz/gmp-reducing-phosphorus-runoff/>

[John Ford Case study](#)

[Pomohaka Sediment and wetland combination](#)