



STREAM BANK EROSION

UNDERSTANDING THE FARMING LANDSCAPE

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The most frustrating thing a landholder to be told is that “erosion is a natural process”, as they watch their fence being undermined by stream bank erosion! Unfortunately, it is the simple truth – rivers and streams are in a constant state of change, and the factors controlling their information and movement are complex and interrelated. In stable streams, the rate of change is generally slow and imperceptible, but still occurs nevertheless. We have seen the evidence of intense rainfall events triggering dramatic and sudden changes in rivers and streams, particularly in the central and eastern parts of the Murray region.

Land use, groundcover and stream management can trigger erosion responses that are difficult to remediate. Streambank erosion can also be accelerated by factors such as:

- Redirection and acceleration of flow around obstructions or debris within the stream channel.
- Removal or disturbance of protective vegetation from stream banks through stock pressure, clearing, fire or trees falling on banks
- Saturation following extensive rainfall.
- Wind or boat wash.
- Excessive or poorly situated sand or gravel extraction

Mechanisms of streambank erosion

The mechanisms of stream bank erosion generally fall under three main headings:

Sub Aerial Erosion

This process occurs when the stream is affected by processes that loosen the soil making it more vulnerable to being carried away by flowing water. Trampling by stock and pest animals, rain eroding bare soil, frost and wind, and uncontrolled vehicle access all contribute to this type of erosion.

Bank scour

This process involves the direct removal of bank materials by the physical action of flowing water and is often seen in smaller streams

and the upper reaches of larger streams. Undercutting of the bank toe is a sign of bank scour. Scour occurs when the force applied to a bank by flowing water exceeds the resistance of the bank surface to withstand those forces. Scour is most pronounced at the outside of meander bends. Lack of vegetation can exacerbate this problem.

Mass failure

This process includes bank collapse and slumping, which is characterized by large chunks of bank material becoming unstable and sliding or falling into the stream in a single event. This type of event occurs more often in the lower reaches of large streams and in association with major undercutting of a bank. Bare and near vertical banks or large amounts of soil dumped in stream are signs of this process. This can be exacerbated again by the removal of vegetation, or an ongoing wetting/drying process.

What can you do?

The best strategy to understand erosion on your property is to walk over your land, including riparian areas after heavy rain and take note of what is happening. Take photos under different conditions over time to compare these images with those taken during drier periods which will help you determine what processes may be occurring. Land clearing or over-grazing upstream can increase the velocity of water causing bank scouring downstream. The collection and channeling of water along stock tracks that lead to a stream can form a side cut down the track. Grazing of in-stream grasses and sedges can increase flow speed and lead to scouring. Debris instream, such as fallen trees, may cause a diversion that places pressure on the adjacent bank.

First and foremost, act before erosion becomes a major problem. Good groundcover and stream bank vegetation are your most effective and simple first line of defense against erosion. Without vegetation cover, up to 85% of rainfall can run off into creeks and streams instead of soaking into the soil and becoming available for plant growth.

When groundcover is low, bare soil provides a path for runoff, helping it to build speed and erode the soil. Good grazing management techniques are no of the most effective ways to manage your groundcover levels.



85%

of rainfall can runoff into creeks and streams instead of soaking into the soil if you do not have adequate vegetation cover



Secondly, fencing watercourses and removing (or limiting) stock access helps groundcover to develop and banks to stabilize. Vegetation profoundly influences scour rates because it affects both force and resistance of water runoff. If you are planning to revegetate riparian areas; grasses, sedges and shrubs are more effective as they develop relatively deep, strong, fibrous root systems that bind to streambank soils. Trees are best planted further away from watercourses, so that they don't fall and create more problems down the track. Abundant streamside vegetation slow runoff, catches silt, softens the impact of rain and helps prevent the undercutting and collapsing of streambanks.

If you use your stream for livestock watering, selectively fence specific stream watering and crossing sites with firm bottom materials (bedrock if available) and gentle, graded slopes. Gravel lined paths will minimize streambank damage. Alternatively, develop off-stream watering points where possible.



Slowing down the flow of surface water is best achieved through groundcover, vegetation and grazing management. If you have sub aerial erosion on your property, isolating the eroded area from stock movements can allow it to settle and revegetate, slowing the rate of scour. In this situation further intervention may not be required.

Other diversion techniques include installing contour banks to reduce the energy of the flow, spread the water flow across the landscape, and direct runoff water from further up the slope to a 'safer' area in the stream.

Seek advice and plan major erosion rehabilitation projects carefully to get the best value from your efforts. Remember that any erosion on your property can affect conditions both upstream and downstream, so engage with neighboring landholders and work together if possible.

In-stream works, such as rock rills, flumes and bank stabilization activities require the submission of an application for a Controlled Activity Permit from the Department of Primary Industries-Water.

FOR FURTHER INFORMATION

Department of Primary Industries - Water
Soil Conservation Service
Australian River Restoration Centre



Australian Government

National
Landcare
Programme



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