



Hold Your *Ground*

Your practical guide to recognising, preventing and managing soil erosion on your property.

Working with the landscape, not against it

Soil is the foundation of productive land. This guide walks through what erosion is, how to prevent it through good property planning, and the practical methods FBA uses to manage erosion once it appears.

Understanding Erosion

What is erosion & why it matters	03
The simple rule: keep soil covered	04
What increases erosion risk	05

Preventing Erosion

Property planning	06
Water points, tracks & fencing	07
Managing water on tracks	09

Managing Existing Erosion

Assess, then act: the steps	11
Stick rake lines & diversion banks	13
Working the gully	15

Keep Going

Monitor the site over time	18
Match the method to your site	19
FBA are here to help	20

What is *erosion*?

Soil erosion occurs when rainfall creates runoff that flows across the ground surface. When water cannot soak into the soil, it moves downslope, picking up and carrying soil particles with it. Over time, this can remove valuable topsoil leading to exposed subsoil, creating erosion features such as rills and gullies.

Why erosion matters to you

For land managers, erosion is more than a landscape issue. The top 10–15 cm of soil contains most of the nutrients and structure needed for healthy pasture and once this layer is lost to erosion, land becomes less productive and harder to rehabilitate.

This guide helps land managers to:

- › Recognise early signs of erosion
- › Understand what causes it on their property
- › Identify practical ways to prevent and manage it
- › Protect pasture productivity and soil health

By managing erosion early, you protect the long-term value and resilience of your land.



Keep soil *covered*

The most effective way to reduce erosion is maintaining good ground cover. When soil is protected by pasture or vegetation:



Rainfall soaks into the soil.



Runoff is reduced



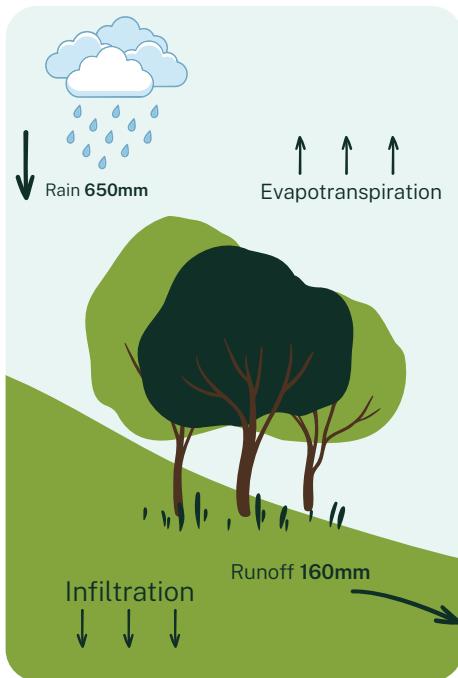
Soil particles stay in place.

Bare soil allows water to concentrate and flow quickly, increasing the risk of erosion and gully formation.

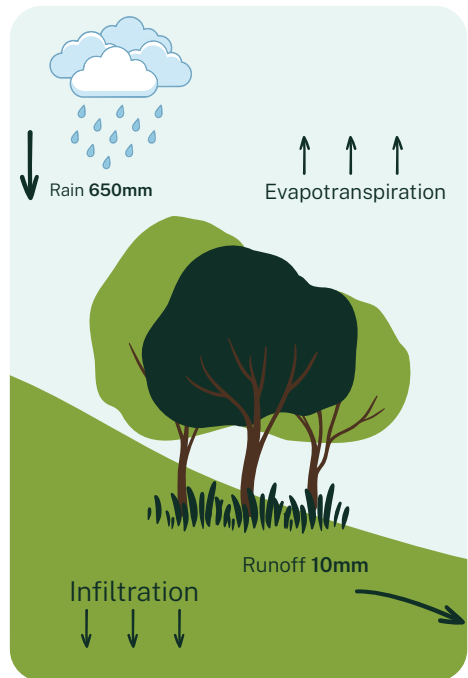
Cover is the cheapest, most powerful erosion control tool you have, and it is already growing in your paddock.

- › With 20% ground cover, there is 160mm of rain lost as runoff.
- › With 70% ground cover, runoff is reduced to only 10mm
- › This difference gives you 150mm more effective rainfall per year.

Ground Cover 20%



Ground Cover 70%



What increases *erosion risk*?

Several factors influence erosion on your property. Effective management means looking at the whole catchment, not just where erosion is visible.



Slope

Steeper slopes increase the speed of moving water.



Catchment Size

Larger catchments send more water through a site.



Soil Type

Some soils are more prone to erosion.



Ground Cover

Bare ground dramatically increases erosion risk.

How a gully forms

Gullies develop when water concentrates and flows repeatedly along the same path often along cattle tracks, fence lines or drainage lines.

As water speeds up, it cuts deeper into the soil. A gully is defined as an erosion channel more than 30 cm deep, and once established it can cause long-term landscape damage.



Right: Deep gully caused by erosion.

Plan with the *landscape*



Property planning is one of the most effective ways to reduce erosion risk. Good property design works with the landscape, not against it.

PLANNING SHOULD CONSIDER

01 Land types

02 Soil types

03 Vegetation types & communities

04 Catchment size

05 Existing infrastructure

06 Business goals

Place water points *strategically*

Water points influence both erosion risk and grazing pressure. Well-positioned water points help spread grazing pressure more evenly, protecting ground cover and reducing erosion.

Avoid Placing Troughs



near gullies



in drainage lines



in riparian areas

Below: Water point positioned away from sensitive areas.



Infrastructure positioning

Positioning tracks, fences and water points along ridgelines and away from sensitive areas can significantly reduce erosion risk while improving livestock management and lowering long-term costs.

PREVENTING EROSION

Place tracks and Infrastructure *carefully*

Access tracks are a common source of erosion if poorly located and designed. Tracks on steep slopes can concentrate runoff, allowing water to gain speed and carry soil away.

BEST POSITION OPTIONS



Place tracks, fencelines and firebreaks along ridgelines.



Avoid drainage lines and erosion-prone areas.

The preferred location for tracks, fence lines and firebreaks is along or near the top of ridgelines, where they collect less water and dry out faster after rainfall.

Manage water on *tracks*



Whoa-boys positioned to manage water on tracks.

If infrastructure must run downhill, install cross-drainage banks such as whoa-boys to divert water off the track and disperse it onto well-grassed areas.

Running across a slope

Follow the contour and build on a slight incline so water flows gently off the surface rather than concentrating along it.

Running downhill

Use cross-drainage banks (whoa-boys) to repeatedly divert water off the track and spread it across stable, grassed ground.

Early fixes such as reshaping and installing drainage can prevent small problems becoming major gullies.

Use fencing to manage *land types*



Fence placement can either reduce or increase erosion risk. Strategic fencing that reflects land types, soil types and natural features allows land managers to manage areas separately and improve pasture utilisation.

SMART FENCE PLACEMENT MEANS:



Maintaining
ground cover



Protecting
sensitive areas



Reducing erosion
across the property

By fencing to land type, you turn a single hard-to-manage paddock into areas you can rest, rotate and protect, keeping cover on the ground where it counts.

The steps to addressing *erosion*

Before reaching for a solution, take time to understand the site. These three steps build the picture you need.

1

Assess the catchment area

The catchment area is the land that drains water to the erosion site. This is important because it determines how much water must be managed. Larger catchments produce greater water flows and may require stronger or more strategic solutions. Digital mapping tools such as Queensland Globe imagery can help identify catchment boundaries and slope.

2

Assess the erosion site

Start with the broader landscape, not just the erosion point. Walk the paddock and ask:

- › Where is the water coming from?
- › Where does it flow to?
- › What is the current ground cover like?
- › What is the size & shape of the gully?

3

Choose your approach

Continue reading for management methods, or contact FBA now to guide you through the options for your site.

Maintain *existing erosion*

If erosion is already present, the first priority is to slow water down and improve ground cover. Reducing runoff and increasing infiltration helps stabilise soil and prevents erosion from worsening. Improving ground cover is often the most effective first step in stabilising erosion.

Natural rehabilitation works well for gullies that:

- › Are less than 50 cm deep
- › Show little or no active head cutting
- › Have stable sides
- › Sit within smaller catchments

Start with grazing management

- › Reduce grazing pressure.
- › Match stocking rate to carrying capacity.
- › Fence the gully off from stock access to improve the ground cover around the edge of the gully.



Not sure where to start with grazing management?
Contact FBA for advice and support.



Stick Rake Lines



Opportunistic use of on-site materials can also support erosion control. They may be constructed on a large scale with a bulldozer, for example, after the removal of regrowth on sloped paddocks.

Alternatively, they may be constructed by hand in small areas, by laying old yard rails and smaller branches above gully heads.

On the small scale, 1 or 2 rows of brush or low logs/rails about 5 m apart is a common design.

Stick-raked timber placed along the contour can slow surface water flow, trap sediment and create favourable conditions for seed germination.

Gaps in stick rake lines should be staggered in a checkerboard pattern to prevent water concentrating downslope.

When installed correctly, these structures reduce sediment movement into drainage lines and assist natural regeneration.

Above & right: Stick rake lines.



Diversion banks & *whoa-boys*

Whoa-boys are low, trafficable cross banks built to intercept runoff and divert it safely to the downslope side of a track. Correct construction and placement can significantly reduce total soil loss. Diversion banks are constructed soil embankments that control surface water across larger areas.

STRUCTURE	MAIN PURPOSE	TYPICAL LOCATION
Whoa-boy	Divert runoff from tracks or roads	Fire trails, access roads, farm tracks
Diversion bank	Intercept and control runoff over larger areas	Slopes, paddocks, construction & rehabilitation sites



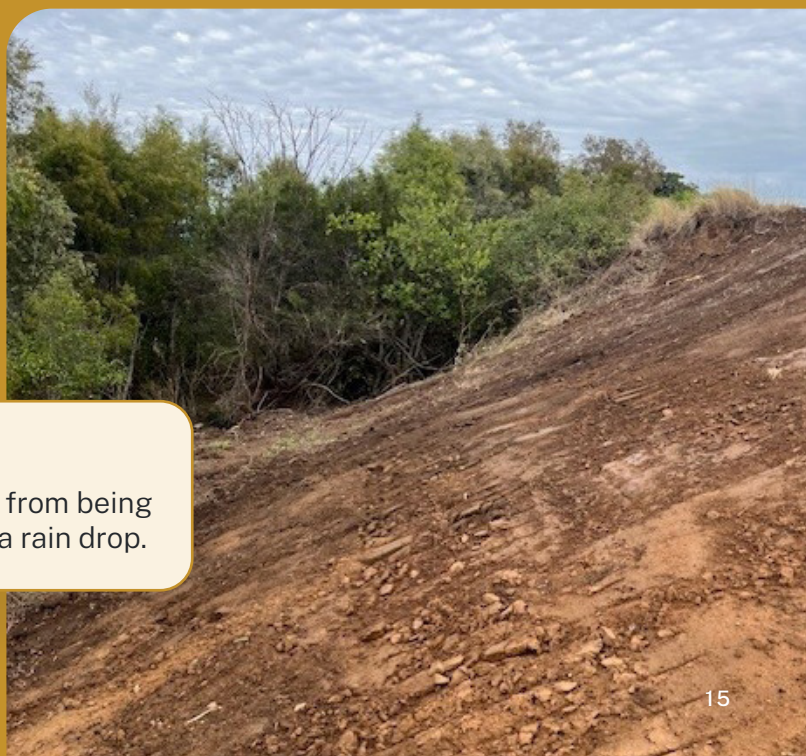
Contact the team at FBA to discuss which would be most effective for your site.

Stabilise steep *gully edges*

We recommend reaching out to the team at FBA to tailor your approach to managing erosion from within the gully. Your approach could include some of the below methods depending on the site.

- 01 Battering steep banks to a stable angle.
- 02 Replacing topsoil where possible.
- 03 Planting vegetation (grasses, shrubs, or trees) whose roots bind the soil.
- 04 Installing geotextiles, erosion control mats, or mesh to hold soil in place while vegetation establishes. For some situations laying down old hay can be effective for this.

Below: Steep banks battered back.



The goal

Protect the soil from being impacted from a rain drop.

Rock filling & *rock chutes*

Where water concentrates and soil needs protecting, rock can absorb the energy of flow and carry it safely downslope, two complementary techniques for stabilising active gullies.



Rock filling

The placement of rocks or stones on vulnerable soil surfaces to protect them from being eroded by runoff. The rocks absorb and dissipate the energy of moving water, reducing the force that would otherwise wash away soil. The spaces between the rocks also slow water flow and help prevent scouring.



Rock chute

A rock chute is an engineered channel lined with rock that safely conveys water down a slope without causing erosion. Think of it as a stone-lined spillway or ramp that allows water to move from a higher elevation to a lower elevation while protecting the underlying soil.

Below: Large-scale rock chute completed by FBA.



Porous check *dams*

A porous check dam (PCD) is a small, permeable barrier built across a drainage line, gully, or channel to slow water flow, trap sediment, and reduce erosion while still allowing water to pass through.

Unlike a solid dam that blocks water, a porous check dam lets water filter through the structure, reducing the velocity of flow without causing large upstream ponding.



Larger scale erosion projects such as streambanks or riverbanks need individual engineering designs, these are created by FBA's Waterway's team. Contact the team today.



Eroding gully before work



After PCD Installation

KEEP GOING

Monitor the site *over time*



Monitoring helps track whether management changes are working and whether intervention is required. One of the simplest tools is fixed photo points. Take photos from the same location over time to observe changes.

MAKE NOTE OF



Changes in
ground cover.



Gully expansion
or stabilisation.



Impact of
management actions.

*Monitoring allows you to adjust management before
problems worsen.*

Year 1

Year 2

Year 3



Match the method to *your site*

Every site is different, but most fit one of the patterns below. Use this as a starting point, then talk to FBA to confirm the right approach for your conditions.

IF YOUR SITE HAS...	RECOMMENDED APPROACH	INPUT
Shallow gully (<50cm), stable sides, small catchment	Rest the area and manage grazing, let it heal naturally.	LOW
Bare or scalded ground on sloped paddocks	Stick rake lines, placed along contour lines and grazing management.	LOW
Runoff concentrating on tracks & roads	Whoa-boys and diversion banks to shed water safely.	LOW
Sediment moving down a channel or gully	Porous check dams (PCDs) to slow flow and trap sediment.	HIGH
Steep unstable gully banks	Batter back, replace topsoil, revegetate, hold with geotextiles.	FBA
An active gully head or concentrated flow	Rock filling and rock chutes to absorb energy.	FBA
Streambank or riverbank erosion at scale	An individual engineering design from FBA's waterways team.	FBA



Not sure which fits your site? FBA can walk the paddock with you and tailor the right combination of methods.



FBA are here to *help*

For further guidance on implementing low-input gully control methods, support and advice for medium or high-input gullies, or to explore available funding opportunities, please contact FBA for tailored advice and assistance.

GET IN TOUCH

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SCAN TO CONNECT

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Australian Government

