Rangelands NRM
Western Australia

Rangelands Rehydration

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Ecosystem Management Understanding (EMU) ™

Making and using "sieve rolls"

Calming and spreading flows without blocking them

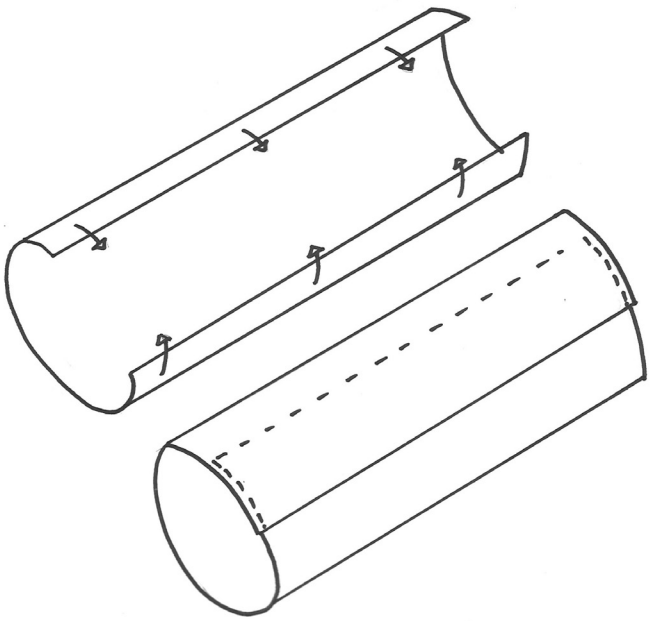
What is a "sieve roll"?

A sieve roll is simply rolled up material that offers resistance to flowing water without blocking it like a bund or earth bank. The resistance to flow makes the flow slow down, spread and deposit sediment. Sieve rolls are usually made from wire or steel mesh using the principle that the heavier the flow, the heavier the sieve required for effect. Sieve rolls are useful when the flow is not to be blocked and when machinery is not available. The idea is that the mesh filter becomes replaced by a living filter of perennial plants as the mesh rusts and degrades. Sieve rolls can be filled with small branches, but this is not usually necessary.

1. Making a sieve roll – what is easiest for you?

1.1 Roll out, fold and fasten method

This is as simple as it sounds; make sure your fasteners are strong.



1.2 Roll out and cut short sections to fold and fasten

This approach is used when short sections are needed or when the material is stiff or awkward to roll (see method 1.1) or spiral (see method 1.3).

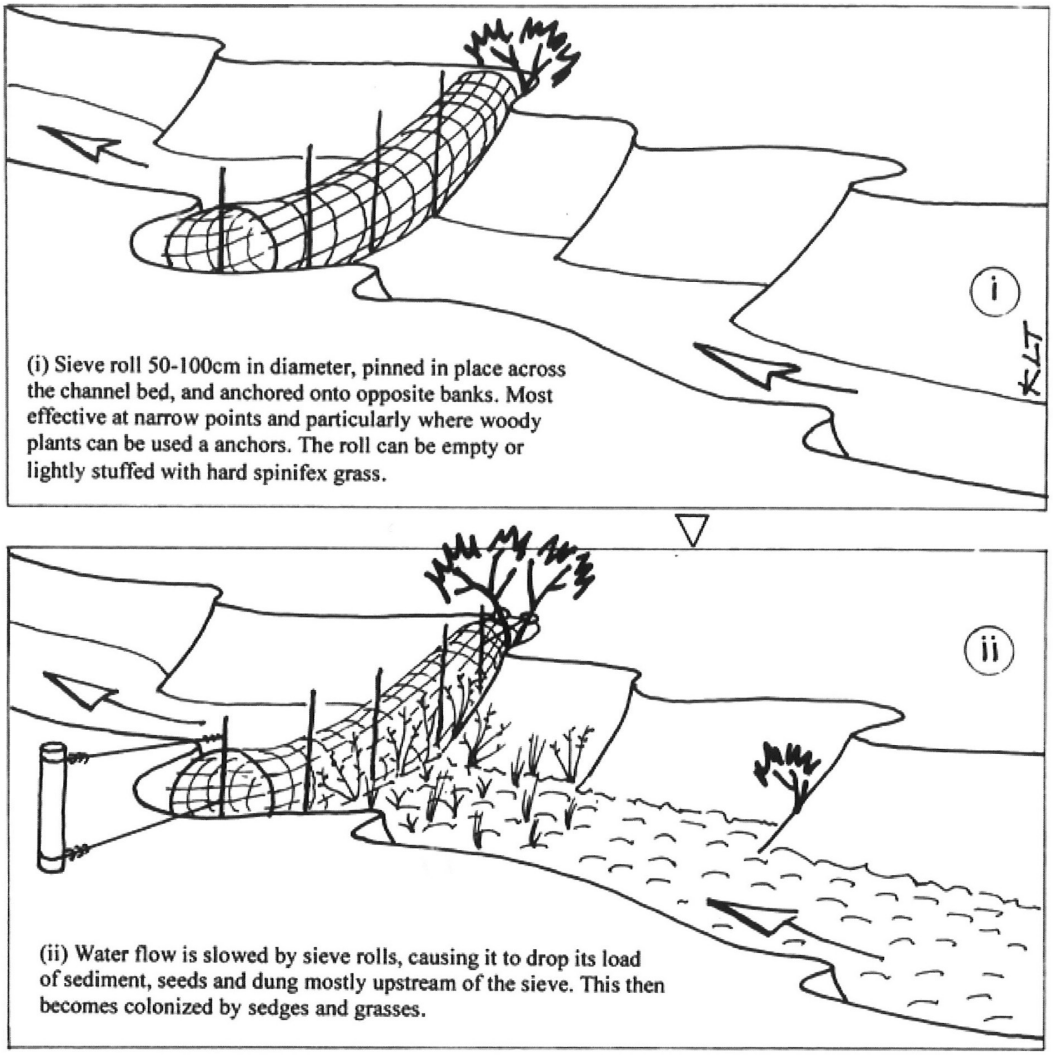
If sections are to be joined together, overlap the ends to ensure that the join is not a weak point. This method is more time consuming than 1.1 and 1.3 but may be useful with awkward materials and avoids wastage. You can also make the sausage the diameter and height to suite the situation/water flow.

1.3 Roll out a spiral and fasten the overlap

Imagine bandaging an arm. This is what you do with the mesh, but without the arm inside! Simply roll a spiral and fasten the overlap so that you get a sieve roll. This method is useful when you want a long, strong sieve roll.

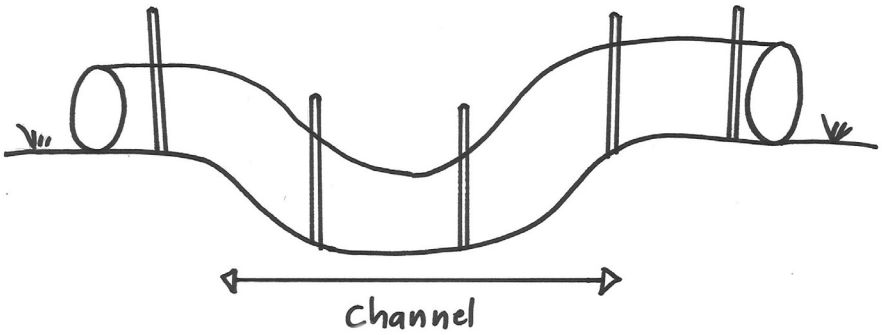
2. Placing a sieve roll

Sieve rolls work best when their contact with the ground is smooth and continuous; without major undulations or sharp sides. Level out the site where applicable and knock down the edges of channels to ensure the rolls lies along the ground without any channels or holes. Any "holes" in the undulations or sides need to be protected with additional, anchored material to avoid focusing flows at their "easy way throughs". It may be worth smoothing the area to be filtered.



ALWAYS EXTEND THE SIEVE ROLL WELL BEYOND THE FOCUSED FLOW AREA/CHANNEL TO AVOID WATER CUTTING AROUND THE SIDES — PROTECT THE EDGES!

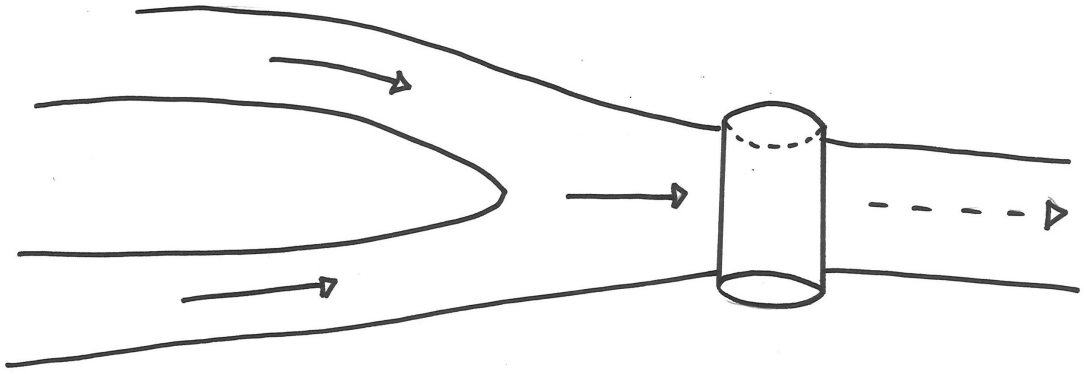
A rule of thumb is to go half as wide again each side, but read the landscape to make this decision. Anchor your sieve roll at each end — and in between if you don't want to allow strong flows to lift the sieve roll. The sturdiness of the anchoring should match the stream flow and weight of the sieve roll.



3. Using sieve rolls strategically

Sieve rolls are appropriate where they can be anchored effectively and accommodate the oncoming flow. Where the flow is excessive for the materials at hand, consider a bund or suspending material into the flow along a strong chord or braided wire ("suspension filters"). Sieve rolls can be used in many ways and for different purposes. They are particularly effective when used in series, not just one. As water exits a roll it carries less sediment and can therefore build up speed and energy to erode soil quickly.

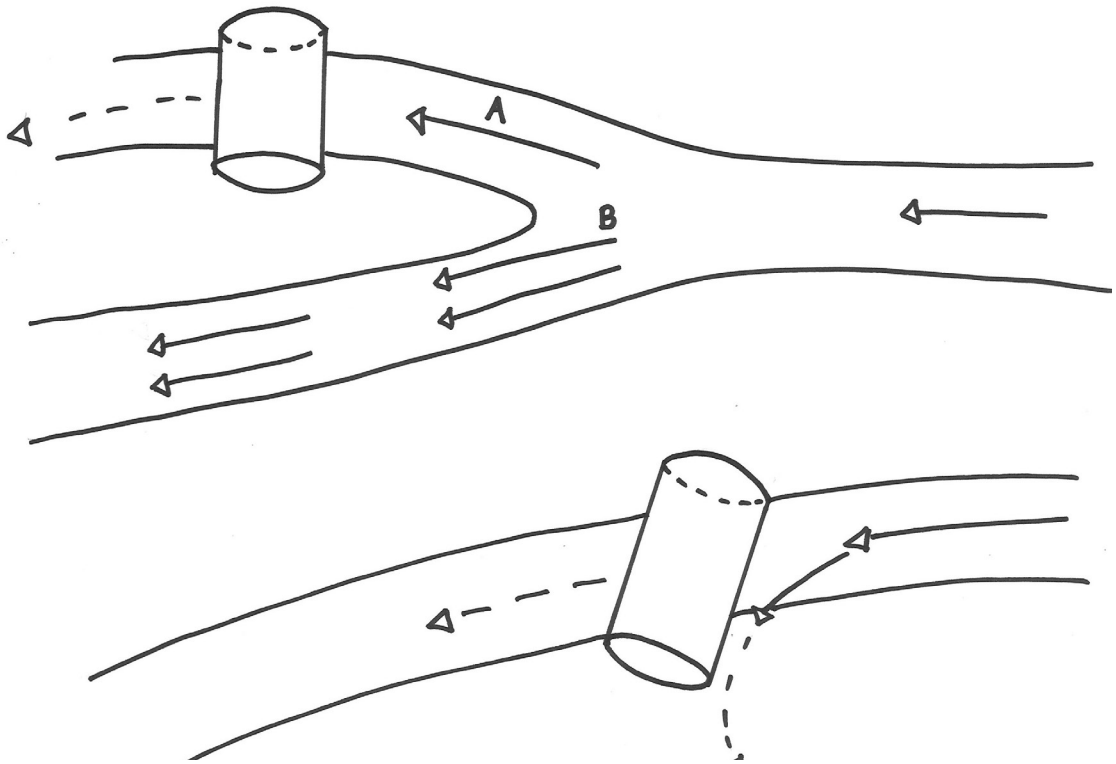
3.1 Filtering confluences



By filtering just below where two flows meet, you slow and spread both incoming flow systems, but do not put the filter in the "fight zone" where they meet. Let them sort each other out and lose energy first, but don't go too far down or the joined flows will have started speeding up again. The "fight zone" is usually obvious on the ground, go just below where you can see the water starts to calm down and starts to drop sediment.

3.2 Favouring a preferred direction of flow

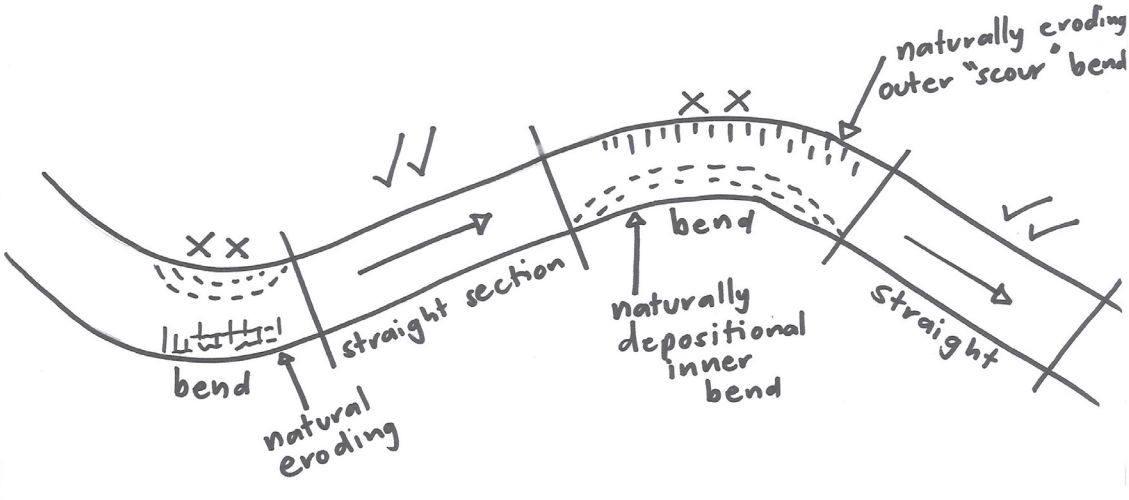
Simply filter the channel you want less water to go down, usually just below the unstable splitting point. Water always chooses the path of least resistance.



You can also use angled rolls across a flow (e.g. a dug in road) to encourage flow to go out of its unnatural path.

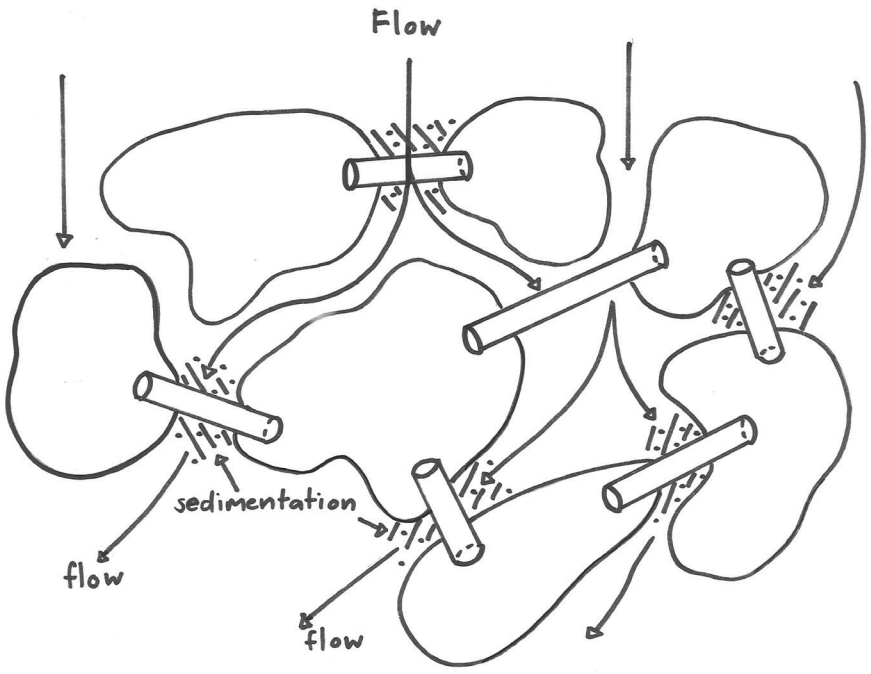
3.3 Avoiding unstable bends

When channels bend they naturally scour the outer bend and deposit sediment on the inner bend. Bends are inherently unstable and inappropriate for sieve rolls (or banks, roads etc). Choose straighter sections, preferably with a smooth — rather than a sharp cross-section shape.



3.4 Linking sediment islands to slow the system

Where a degraded plain has islands of restabilised or remnant topsoil, water and wind rush through the gaps and drive the landscape to be less stable and productive. Filtering the gaps can reverse this tendency towards sediment accumulation and coalescence of sediment islands.



4. Why use sieve rolls?

Sieve rolls do not require heavy machinery or block and divert natural flows. They also:

1. are "low impact" and if they fail the damage is usually minimal compared to earthworks
2. allow water to flow below them
3. are often made with discarded materials
4. can be replaced as they degrade by local perennial plants (naturally or preferably with some help!).

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