

RIPARIAN VEGETATION HEALTHY FORESTS...



Taking care of Emigrant Creek downstream from the dam also means caring for its forests. Native trees and other plants play an important role in the water cycle and the natural purification of water (see *Info Sheet 6: Rainforest Regeneration*). 'Riparian vegetation' is particularly important.



What Does 'Riparian' Mean?

'Riparian land' means land that adjoins or directly influences a body of water. In the case of Emigrant Creek, it includes:

- the land immediately next to the creek, including the creek bank itself
- gullies and dips which sometimes run with water
- the area surrounding the dam
- wetlands and the floodplain that interact with the creek in times of flood.



These areas are within the catchment area for the dam, but also land connected to Emigrant Creek downstream from the dam.

It is important not to think of riparian land as just a narrow strip along the creekbank.

Healthy native vegetation in these riparian areas is vital for healthy creek ecosystems and good water quality.

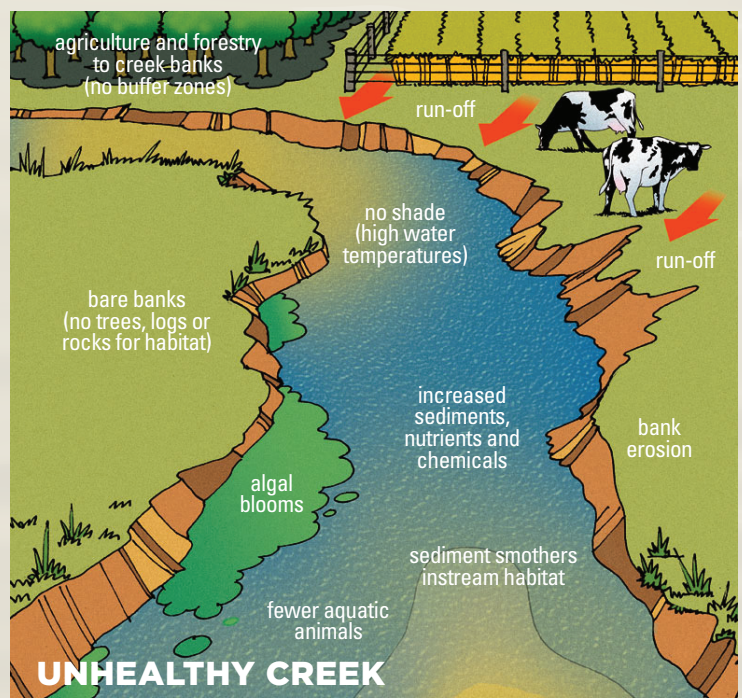
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Without Healthy Riparian Vegetation

Creeks can become contaminated by a range of material from adjacent land. This can include soil particles (sediment), nutrients such as nitrogen and phosphorus, salt, plant material from crops, chemicals and microbes. In rural regions, eroding soil and associated nutrients are the most important and widespread causes of reduced water quality.

Sediment and some nutrients are carried to creeks primarily in overland flow of water. This flow can range from thin threads to broad sheets of water, and may be concentrated in dips and gullies in the landscape. Dissolved nutrients such as nitrogen, salt and other materials (including dissolved organic carbon) can move through the soil in underground flows and contaminate streams as they enter them from beneath the ground surface.

Extensive clearing of deep-rooted, natural vegetation from our catchment areas for agricultural and urban development has resulted in rainfall moving off the land surface at a much faster rate. This has led to substantial increases in the amounts of sediment entering our streams and rivers. This sediment and its associated nutrients and chemicals can contaminate human and stock water supplies, smother breeding sites for fish and other instream animals, and, by filling-up stream pools, deprive these animals of the deeper waters that are a vital refuge in dry seasons and prolonged droughts.





The Importance of Riparian Vegetation. Physical and Chemical Effects:

Shading and temperature regulation.

Trees and shrubs on the banks and within the stream provide shade and shelter for aquatic and terrestrial fauna. Fish and aquatic organisms need moderate temperatures to live and breed successfully. Riparian vegetation provides shade to streams and regulates stream temperature. Both act to prevent excessive growth of water plants and filamentous green algae in the creek, even when nutrient levels are increased. (Excessive algal growth causes major changes in aquatic habitat and reduces oxygen levels in the water through plant respiration and the accumulation of organic matter.)

Filtering sediments and nutrients from run-off.

Vegetation can slow the overland movement of water, and cause sediment and attached nutrients to be deposited on the land before they can reach the creek. Riparian vegetation can also take up and remove some of the nutrients being transported in water flowing beneath the surface of the ground. Deep roots can suck up these nutrients so that the plants use them for growth, rather than them entering the creek.

Stabilising the creek bank.

The root systems of trees, shrubs and grasses bind and hold the banks together much in the same way that reinforcement improves the strength of concrete. This prevents erosion of the creek banks in times of strong flow.

Wind breaks.

Tall and dense vegetation can also reduce the spray drift of agricultural chemicals into the creeks.

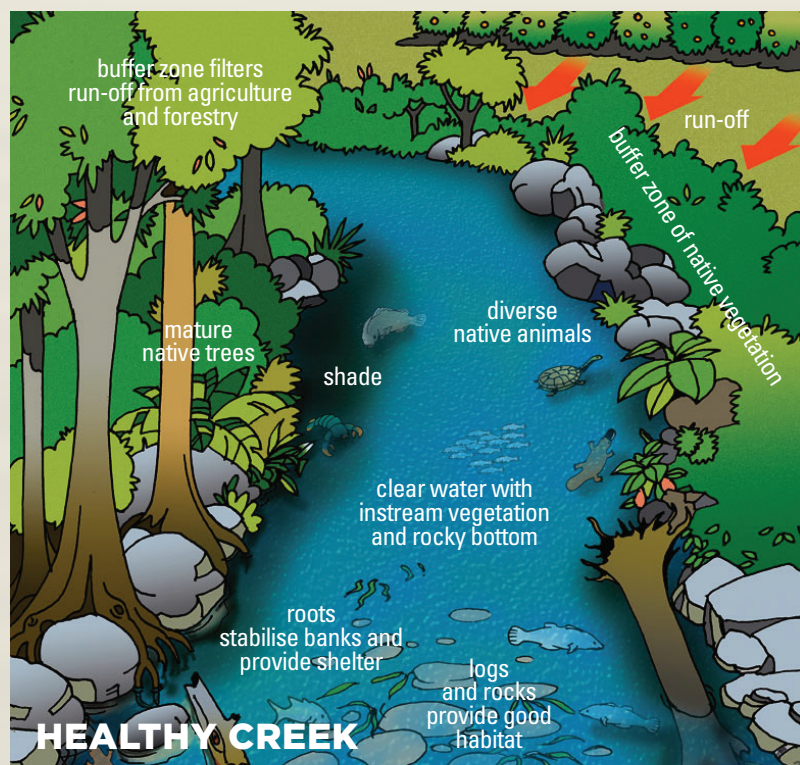
Ecological Functions:

Nutrients and energy.

Bank vegetation provides food for fish and other aquatic life in the form of leaf litter, plant debris and insects falling from the trees. It creates a basis for a healthy instream food-chain.

Habitat from woody debris.

Under natural conditions, trees occasionally fall into the river, creating woody debris which is an important habitat for aquatic organisms. Submerged logs and the overhanging roots of trees and shrubs provide places for fish and other water organisms to rest, live, breed and hide.



Protection of in-stream habitat.

Reduced siltation protects underwater habitat for a range of aquatic plants and animals, including fish.

Habitat for land-based wildlife.

Native vegetation provides habitat and food for native animals, including pest-controlling predators (which reduce the need for agricultural pesticides). This land-based wildlife interacts with the water-based wildlife and vegetation, creating a healthy whole creek ecosystem.

All of these physical, chemical and ecological effects of riparian vegetation contribute to improved water quality.



Rainforest Regeneration Along Emigrant Creek

This picture was taken in the 1970's soon after the dam was built. It was taken by the big pool downstream from the dam and just above Killen Falls. There are many changes between then and now. From the picture, it appears that people used to be able to drive down Killen Falls Road and down along the creek, directly to the edge of the big pool and camp there.

Native rainforest trees, as well as Camphor Laurel trees and other exotic vegetation such as Lantana, then recolonised the area without any human assistance.

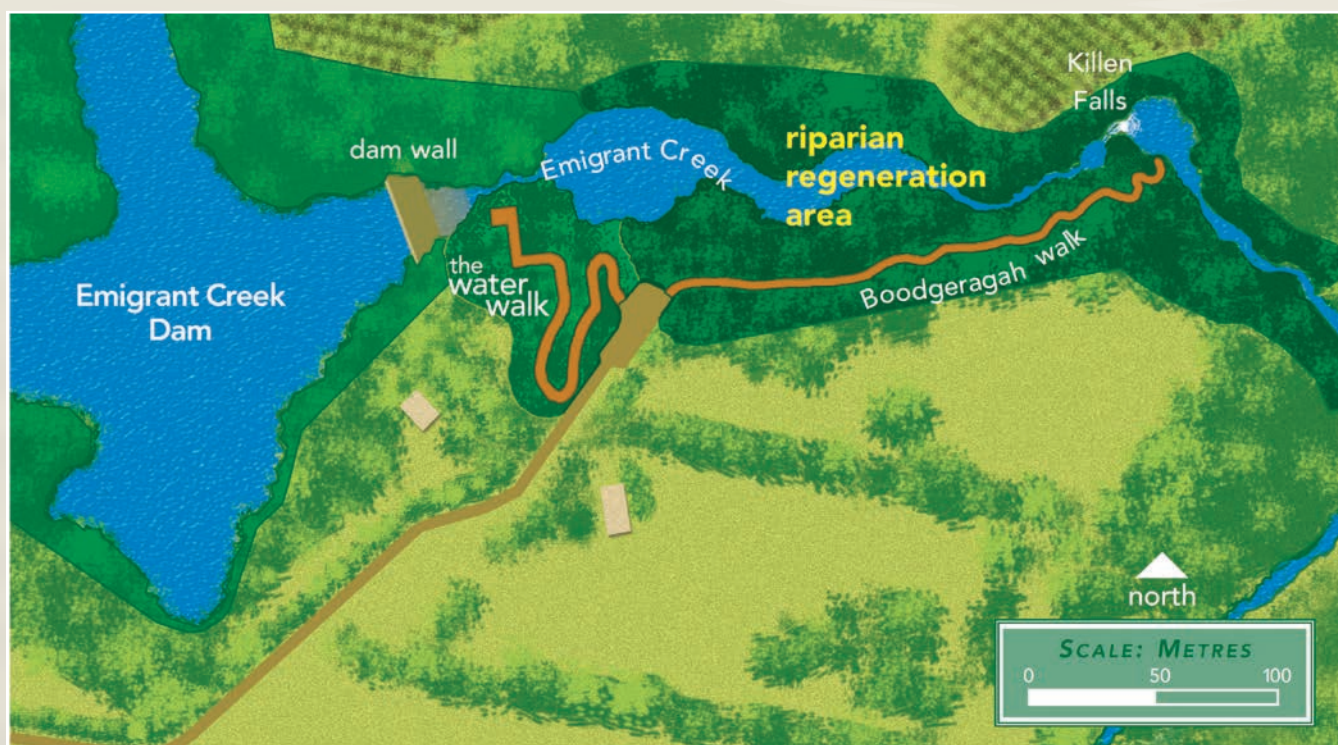
Anthony Acret, says *"This is basically the key lesson when regenerating rainforest in the Big Scrub country. It is all about weed control. If you control the weeds and let the seed bank grow (seeds left in the soil dropped there when the trees were standing) and let animals do their bit spreading seed around, then the regeneration shall occur. Less disturbed sites will have a more viable seed bank and so this process will happen more easily."*



Rous County Council, in partnership with Ballina Shire Council, Big Scrub Rainforest Landcare Group, the Emigrant Creek Environmental Protection & Landcare Association, Rainforest Rescue, and local landholders are undertaking a rainforest regeneration project along Emigrant Creek, between Killen Falls and the dam itself. This project involves the progressive removal of weeds and exotic tree species such as Camphor Laurel, and some infill planting of native species.



It will create an unbroken area of riparian forest from the Big Scrub rainforest remnant (Killen Falls Reserve), through the Water Walk regeneration area, to the regenerating 'buffer zone' around the dam. This forms an effective wildlife corridor, as well as protecting and enhancing the aquatic ecosystems of Emigrant Creek.





Taking care of Emigrant Creek downstream from the dam also means caring for its forests.

TRY THIS!



Learn with your...



"How do trees and other plants protect the quality of water in creeks? Why is this important?"



"The picture on the sign shows what the edges of the creek used to be like in the 1970's. How do you feel about the way the edges of the creek are now? Can you imagine how different animals and plants might also be benefiting from this change?"



"Take a look towards the creek. Can you locate where the camping ground used to be? What is different about this area now? How many years has it taken to get like this? What do you think the area might look like in the same amount of time in the future?"

Learning objective: To understand the role that riparian vegetation plays in healthy creek ecosystems; the reasons that Rous County Council are concerned about this; and the role that they are playing in the rainforest regeneration project downstream of the dam.



(Sources: Riparian Land Management Technical Guidelines – Vol. One by Land & Water Australia (2002); River Landscapes Fact Sheet series by Land & Water Australia (2002); Julie Olsen (2003) A Beautiful Farm produced by Rainforest Rescue, Australian Macadamia Society & Rous County Council; Peter Stace (1995) Windbreak Trees for Economic Biodiversity, Paper presented at the 6th Conference of the Australasian Council on Tree & Nut Crops)

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These information sheets were originally prepared for Rous County Council by Sustainable Futures Australia in liaison with Widdjabul elders. © Rous County Council and Sustainable Futures Australia 2007. This is an educational project for the protection of water land, and for reconciliation.

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