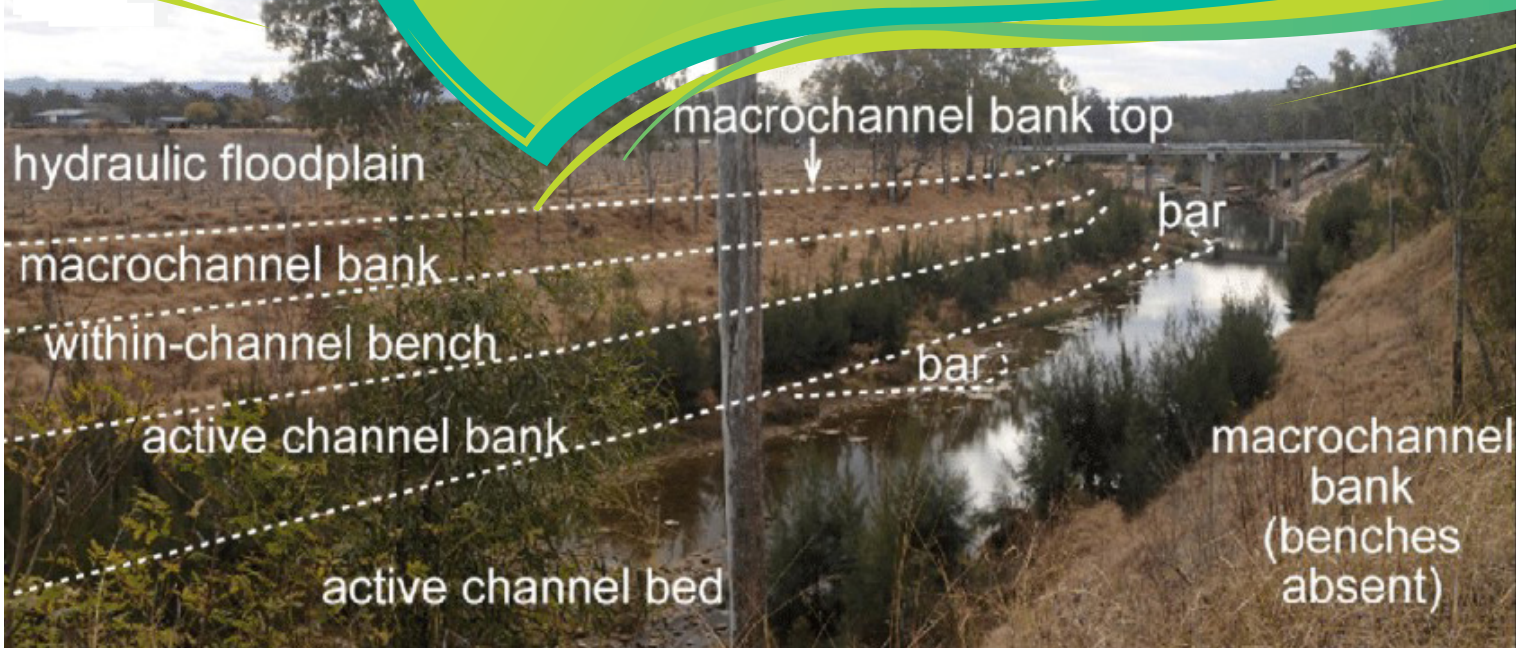


Our Environment

Keeping the Lockyer in the Lockyer
The science behind the project



REGIONAL COUNCIL



Croke et al (2016)

The science behind the project

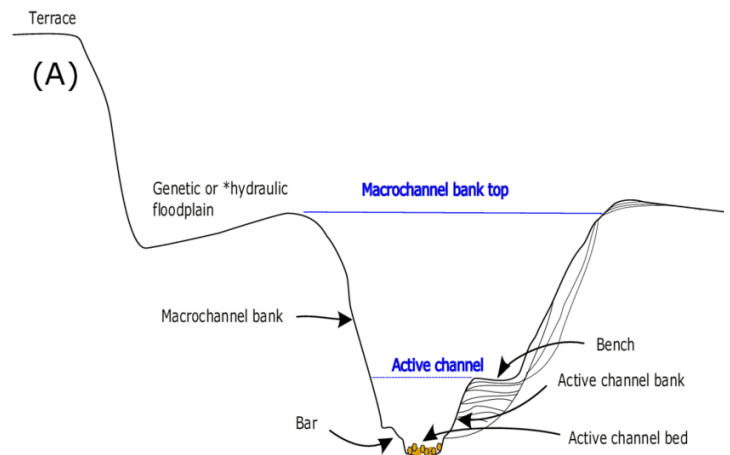
The stretch of the Lockyer Creek from Smithfield Road (Daveys Bridge) to Goos Road, Gatton was chosen based on the best available scientific research. This portion of creek was identified as having high erosion potential with a channel primed for revegetation and is upstream of a possible change in creek path.



Pilot revegetation areas, Gatton

High erosion potential

The stretch of the Lockyer Creek from the Gatton Racecourse to Cahill Park has been identified as having high erosion potential. This is because the shape of the channel in this reach is deep and narrow meaning the water stays within the banks during flood events (contraction reach). As the water stays within its banks it tends to run faster and harder until it reaches an area where the creek spills out over its banks (expansion reach). When the water spills out onto the floodplain it tends to slow down and deposit silt (alluvium), hence the name alluvial floodplains.



Croke et al (2016)

Revegetating the creek for erosion control

The science behind the project

FAQ

Won't trees cause the creek to flood?

We have sought advice from expert hydraulic engineers to make sure the revegetation works won't negatively impact residences or the creek during major flood events.

Do trees in the creek cause erosion during flood events?

Not necessarily. Different plants are suited to growing in different parts of the creek. For example mat rushes and bottlebrushes are able to bend and lay flat during flood events helping the water slow down and protecting the soil underneath. Therefore these species are best suited to being planted lower in the creeks. Larger Eucalypts high up on the creek banks help to stabilise the soil with their large root systems and are out of the way of the fastest flood waters.

Certain weed species on the other hand have the potential to cause erosion. For example Elephant Grass is a bamboo-like densely clumping grass, often present in our creek. During fast flowing floods events, these clumps can become dislodged taking masses of soil with them. They then float downstream and can become lodged on structures such as bridges which can cause further erosion near the structure.

Croke, Jacky & Thompson, Chris & Fryirs, Kirstie. (2016). Prioritising the placement of riparian vegetation to reduce flood risk and end-of-catchment sediment yields: Important considerations in hydrologically-variable regions. *Journal of environmental management*. 190. 9-19. 10.1016/j.jenvman.2016.12.046.

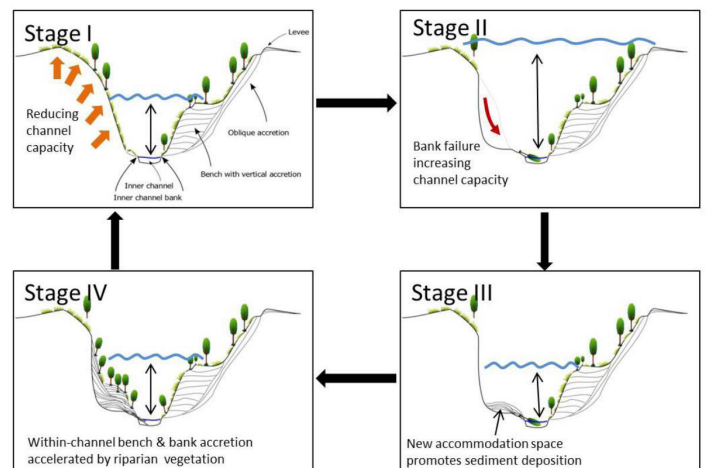
Thomson C.J., Croke J., Fryirs K. and Grove J.R., A channel evolution model for subtropical macrochannel systems (2016) *Catena* 139, pages 199-213

Channel primed for sediment trapping

Researchers identified that the section of creek stretching from upstream of the Gatton racecourse to Forest hill – Fernvale Road bridge is primed for revegetation. They described a cyclic creek evolution process over 4 stages:

- I. steep and narrow channels where the bank is at risk of collapsing
- II. the bank collapses and washes away creating a larger channel capacity
- III. sediment becomes deposited creating benches where the bank collapsed
- IV. vegetation starts to grow on the newly deposited sediment and continues to increase over time.

They suggested that creeks at Stages III and IV should be targeted for revegetation on the benches to increase sediment trapping and improve the strength of the banks.



Thomson et al (2016)

Potential for the creek to change course

Researchers identified the potential for the creek to change path (cause an avulsion) during the next major flood. It was suggested that to reduce the potential for this avulsion, and maintain a healthy stable creek, vegetation should be planted in the creek upstream from this point to reduce the intensity of the water, reduce the risk of erosion and increase sediment deposition in the right places in the channel.

Together these three factors contributed to the decision to prioritise the works to between Smithfield Road (Daveys Bridge) and Goos Road, Gatton. This initial pilot project will focus on two sites within Council managed land. One, adjacent to Beavan Street and the other near Cahill Park, Gatton. It is expected that future funding will be secured for more sites within this stretch of the Lockyer Creek.