

MLG Field Trip

Riparian zone management & gully erosion remediation

Led by Haydn Burgess, Senior Project Officer at Greening Australia

On a cold and foggy Sunday morning in June 2017, MLG held a field trip at Windy Hill, a 31 hectare property on the Murrumbidgee River not far from Murrumbateman. The owners and landcarers, Janette and Miles, had asked for advice on two tricky problems:

- how best to restore the riverbank to a healthy mix of river red gums, casuarinas, native reeds and grasses despite the impact of occasional significant floods, which have knocked down young trees and brought numerous weeds including willows
- how to remediate several patches of erosion in a gully leading to the river, which has persisted despite being rested from stock for 15 years.

A dozen landcarers attended the field trip, including Ross Webster who provided his invaluable expertise in willow and blackberry management in riparian zones.

Restoring the riverbank

Willows

Q: What is the best way to remove willows from the riverbank?

Willows need to be poisoned at a time when they are actively growing so they absorb the poison. If the tree is large, use a broad chisel and hammer to cut a horizontal line 2-3 cm deep around the entire circumference of the trunk, effectively ringbarking the tree. With each blow of the chisel, pull the willow bark down slightly to form a small lip all the way round the trunk. Fill this lip with Roundup Bioactive. (This version of Roundup contains an 'aquatic approved' surfactant, allowing for use in sensitive areas such as around water courses.)

For smaller trees, cut off the trunk close to the base using a chainsaw and immediately paint the stub with undiluted Roundup Bioactive. Be sure to remove from the riverbank all parts of the willow that have been cut off – even a small willow stalk can readily root itself in damp soil and grow into a new tree.

If a smallish willow has multiple trunks (such as in the photo below), select the biggest of these trunks/branches (about 8) and cut them as close as possible to the base. Apply undiluted Roundup immediately to the cut area with a paint brush and be liberal with its application.

Q: Should all willows be removed even if some are performing a useful service in securing stock-proofing fences at the water's edge?

Not necessarily. Although ideally all willows would be removed, it may be helpful to leave those that are performing a useful function in protecting the riverbank from other environmental hazards. For example, a willow that is anchoring a fence used to keep stock away from the riverbank is performing an important function that may be difficult to achieve in any other way. One option may be to poison such a tree using stem injection but leave the dead tree in situ.



This willow established from debris dropped after a flood.

Blackberries on the riverbank

Q: Should blackberries on the riverbank be sprayed with chemicals at the risk of contaminating the river or killing native vegetation?

Yes – with great care. Use Garlon (or Grazon or a generic spray with the same active ingredient) in a backpack with a brass spray head to spray blackberries in a low, fine gentle mist. Although you should make every effort to avoid spraying any nearby natives, a very small amount of drift on the lower branches will not overly affect the natives. A fine mist is sufficient to kill the blackberry plant in the long run and will avoid unnecessary wetting of nearby native plants and drift into waterways.

Note that Garlon is very long acting – it may take six months to kill the blackberry plant – but is 99 per cent effective. It will kill all woody weeds but not grasses

underneath. Combine the recommended amount of Garlon with Brush-off (dissolve this first in a little warm water) and a surfactant (wetting agent). Spray blackberries from November to March when they are active.



Spraying the lower branches of this blackberry, intertwined with kunzea, with a very fine mist of Garlon or similar should kill the blackberry slowly without killing the kunzea.

Q. Should blackberries be left in any situations where they might be used as native habitat?

As with willows, there may be situations where it is very difficult to remove all parts of a blackberry (eg on a steep riverbank) and it may be performing a useful function, such as providing protection for platypus burrows. In this situation, spray the accessible parts of the blackberry with a mist of Garlon (as above) to prevent it spreading away from the river but leave the dead blackberry stalks in place on the riverbank.



Blackberries and other weeds on a steep bank of the Murrumbidgee.

Weeding strategy on the riverbank

Q: How should we tackle the many smaller weeds that infest the riverbank?

If you notice a new weed appearing one season, pull it out as soon as possible to avoid a new infestation that will be more difficult to manage in the long run.

Weed around the base of any young natives to help them get established and avoid weed competition.

Prune the lower branches of casuarinas or young eucalypts to allow flood material to pass by rather than knock down young trees or wedge and take root (in the case of willow cuttings). Pruning the lower branches will also make it easier to spray weeds.

Brushcut weeds before they set seed to reduce the future seed bank.

Revegetating the riverbank

Q: Is it worth the effort of planting casuarinas and eucalypts on the riverbank when the next flood may wipe them out again?

Yes. Keep at it! It can be frustrating when a flood takes out recently planted or even quite well established young natives but not everything will be lost. Be persistent and there will be some survivors.

Q: What native species should we plant on the riverbank?

Greening Australia suggests planting River Bottlebrush (*Callistemon sieberi*); Silver Wattle (*Acacia dealbata*); *Acacia rubida*; and River Red Gum (*Eucalyptus camaldulensis*).

If the river sand on the dry bank is too porous to allow tubestock to get established in dry seasons, try using the long-stem planting method. This helps trees get their roots established much deeper in moister soil and does not result in collar rot.

Remediating gully erosion

Q: How do we stop rain run-off from exacerbating existing erosion?

If possible, examine the site while it's raining to determine where the water is running into the erosion site. Place logs above the headcut in such a way as to divert the rain run-off away from the headcut. Then place smaller branches lengthways in the erosion rills (vertical water flow channels) to slow the water down. If available, lop any nearby native shrubs that are carrying seeds (eg *Melaleuca parvistaminea* or *Bursaria spinosa*) or wattles ready to drop seed and lay these lengthways in the rills. Don't use straw bales either above the headcut or in the erosion rills because of the risk of weeds later generating from the straw.

Another approach to stabilising lower ground in the erosion site is to set up micro-sites or small colonies of native shrubs. Lay chicken wire to stabilise the ground and either lay seed-laden shrub branches or spread collected shrub seeds among the chicken wire.

Q: Is it OK to use prunings from a non-native such as hawthorn or olive trees to place in erosion rills?

Yes, but take care that there are no hawthorn fruits or olives remaining before placing the branches in the rills.

Q: Can we just throw our olive prunings into the erosion site? Will this work?

It's better to be strategic by placing clippings in the rills rather than just tossing them in haphazardly. This will also minimise disturbance of the site.

Q: Should we throw large logs into the erosion site?

Place fine branches rather than big logs in the erosion site. The bigger the material the greater the risk of them causing more damage when washed further down in heavy rainfall. It's better to use brush and small wood. Again, be strategic! Place wood horizontally at the bottom of the erosion site to slow down the flow of rain run-off and to stop the downhill slide of soil. In the steeper parts of the erosion site, place brushes and small branches vertically in the rills.



Erosion site still bare and progressing 15 years after stock were excluded.

Q: Should we put rocks in the erosion site to slow down rain run-off?

This depends on the size and slope of the erosion site. Placing rocks in small, shallow, less steep erosion sites can be a manageable task and useful as long as the rocks will not be washed down the erosion site in heavy rain. However, wide steep erosion sites would require very large rocks and this is unlikely to be manageable without causing further destruction at the site.

Q: Should we plant trees near the top edge of the erosion headcut to hold the site?

Not recommended. Most effective in slowing down overland water flow is good strong grass cover. Grass doesn't grow under trees so it's better not to have dense tree growth in spots where there is rain run-off into erosion. Shrubs would be more helpful as more grasses will grow around them.

Promoting further revegetation in the gully

Q: What are some useful methods of speeding up revegetation of the gully bottom?

If native shrubs are nearby or starting to get established in the gully, brushcut or lop some of these when the flowers are out and then lay the cuttings in less vegetated areas to hasten and maximise the spread of local plants.

Q: Should we plant more understorey shrubs to bring greater biodiversity in plant and animal life to the gully revegetation zone?

It's not essential but you could plant a range of local shrubs favoured by woodland birds, such as:

Acacia buxifolia
Acacia genistifolia
Acacia gunnii
Acacia paradoxa
Bursaria spinosa
Cassinia longifolia
Dodonaea viscosa subsp. angustissima

Greening Australia does not recommend planting callistemons because these will attract honey-eating birds, which outcompete small woodland birds.

Q: Should we plant trees in the small grassy side-gullies that lead into the main gully?

It's better not to plant anything right in the bottom of the gully because any planting will disturb the ground, which can allow new erosion to begin during rains. Instead copy the natural habit of the local trees and shrubs, which tend to establish themselves on the sides of the gully just above the gully bottom. Take advantage of any existing flat bare patches to plant in soil that has already been disturbed.

Grazing stock in revegetation zones

Q: Should we ever allow stock to re-enter a revegetation site once the trees are reasonably well established and have reached a robust size?

Yes. Grassy woodland has always been grazed in one way or another eg by kangaroos. This allows native grasses to compete with introduced grasses. If you keep the revegetation area isolated for long periods, successive seasons of grass growth will matt on top of each other, preventing a diversity of native grasses to germinate. For small native plants to emerge, land needs to be grazed for short periods. Allow stock to graze in established revegetation zones for a couple of weeks but monitor grass levels closely to avoid over-grazing. There will be a risk of cattle eating young acacia seedlings but the loss of a few acacia seedlings will be outweighed by the benefits of greater biodiversity of small native grasses.

And lastly, don't forget to notice and enjoy the small successes and achievements that come from all your hard work.



Healthy section of gully 15 years after initial revegetation planting with support from Greening Australia.