CASE STUDY - ESTABLISHING RIPARIAN VEGETATION AT TWO URBAN SITES AT BURNSIDE

Urban watercourses bear little resemblance to their condition prior to European settlement.

In the early years of settlement, grazing of stock destroyed much of the native riparian vegetation and introduced weed species. The subsequent urbanisation of the catchment has:

- increased the variability of the flow
- increased the load of sediment and litter
- increased the load of dissolved and suspended pollutants
- introduced a range of exotic riparian species
- led to the concrete lining or piping of watercourses

All these factors make the task of establishing riparian native vegetation difficult.

Within the existing system of degraded watercourses, opportunities still exist for re-establishing native riparian vegetation. These opportunities exist wherever watercourses are open channels and are not lined with concrete.

Urban watercourse sites also have some advantages for vegetation establishment in that they are smaller and have a higher profile than is the case for rural watercourses. For these reasons, more resources can often be made available for a given area and these resources can be applied for a longer period of time. Supplementary watering is often possible over the first summer. It is possible to develop vegetation of higher quality at urban sites than can usually be achieved at rural sites.

The City of Burnside is gradually improving the vegetation quality at various urban watercourse sites. Two of these sites provide examples of the approaches taken to watercourse stabilisation and revegetation in creeks of different flow regimes.

Minor Drainage Line - Beaumont Common

In its original state, the watercourse at Beaumont Common flowed very infrequently as it was relatively high in the catchment and surrounded by woodland vegetation. It was not wet enough to cause a change in the Grey Box canopy and its only noticeable influence on the vegetation was to encourage the growth of scattered rushes along its alignment. With stock grazing and then urbanisation, the watercourse became a small eroded gully through a mown park which still retained some of the Grey Box canopy.

In 1998, the Burnside Council decided to undertake an engineering project to stabilise the creek. To mitigate the erosive forces of the water, a structure was built to direct high flows into a pipe buried beneath the creek and to direct low flows over the surface. The profile of a gentle swale was created where the erosion gully had developed. The ability to control overland flow, enabled the development of vegetation without the risk of erosion.

Initially only trees were planted as trees do not interfere with weed control and, for the first 12 months, the main focus was on the weeds. Weeds were thoroughly sprayed out and frequently followed up. Rye-corn was sown in late winter to provide a non-persistent ground cover and weeds were sprayed amongst it. The only indigenous species to regenerate naturally during this phase of the project was the native coloniser ***Lythrum hyssopifolia***. Plants of this species were marked and protected during weed control.

As the water regime in the watercourse is variable and subject to prolonged periods without flow, we propagated local aquatic species that are drought tolerant. The species selected were ***Cyperus vaginatus*** and ***Juncus subsecundus*** with some ***Carex tereticaulis***. A range of local dryland species were planted in the adjoining higher areas. These were planted in spring 1999 and watered for the first summer. Native grasses were sown in subsequent years as areas became free of weeds.

The key to success is to frequently revisit the site and remove every weed as soon as it appears. Recognising natural regeneration is critical too, and short pieces of cane were used to mark any naturally generating local species.

Management now involves patrols for weeds and the cutting back of vegetation after the life cycle is completed and responding to requests from residents to crown lift trees to create a more open landscape. The patrolling for weeds is the most important because weeds can come down in the water and become established without being noticed. A single weed soon becomes an infestation if not removed immediately.

1999 Creek at Beaumont Common – engineering works complete

2005 Creek at Beaumont Common – riparian native vegetation established

Major Creek - Second Creek at Simpson Reserve
Simpson Reserve is about 2km downstream from where Second Creek flows out of Slapes Gully. The creek at this location is perennial and subject to very high flows at times. Prior to farming and urbanisation the area was certainly a diverse wetland environment with Tea Tree and Swamp Wattle. The remnant occurrence of ***Phragmites*** indicates that the creek at this location was probably a reed-bed on a broad swampy flood plain. At the start of the project in 2003, the reserve was an impenetrable thicket of introduced plants with some indigenous plants present notably ***Phragmites***, ***Persicaria*** and one specimen of ***Acacia provincialis***.

The reserve is a very narrow length of creek-line with private property on each side. To make the reserve accessible to the public, Council decided to fill part of the floodplain to construct a dry path through the reserve. The effect was to create a channel with an increased risk of erosion. Rock-filled mattresses were used to stabilise part of the new creek profile. During construction, the few naturally occuring indigenous plants on the site were lifted and grown at the nursery for later return to the site.

Another decision that caused problems later was to retain some Ash and Poplar trees as part of the project. Ash trees are very detrimental to the development of native riparian vegetation because they produce masses of seedlings each year. Field workers took there own decision to gradually kill ash trees on the site and although ash trees on adjoining private property continue to shed seeds onto the site, the yearly removal of seedlings is now manageable. The poplars are confined to the western end of the reserve and continue to produce suckers which require hours of work to keep under control. But the trees are large and no one wants to take responsibility for removing them.

As at Beaumont Common, trees were planted immediately because they do not interfere with weed control and rye-corn was sown to provide a ground cover. The presence of weedy trees and the risk of erosion made vegetation establishment at this site more difficult than at Beaumont Common. On two occasions, works needed to be done to repair erosion heads that had formed and on both occasions vegetation development had to start again in these disturbed areas. It was only after the creek was stabilised that vegetation could be established and guided to its present condition.

The rock-filled mattress structures were stark when installed but we worked potting soil into the spaces between the rocks and established native plants. The development of ***Phragmites, Cyperus*** and other aquatic plants in rock mattresses eventually held the structure together and tied it to the adjoining soil. The appearance quickly softened.

Natural regeneration included ***Eucalyptus camaldulensis, Pragmites, Typha, Carex fascicularis, Lythrum hyssopifolia, Epilobium billardieranum, Dichondra repens*** and ***Persicaria***.

2003 Second Creek at Simpson Reserve – engineering work complete

2007 Second Creek at Simpson Reserve – riparian native vegetation established

Conclusion

The key lessons from our work at these and other watercourse sites in Burnside are:

- Erosion - build enough hard engineering to hold the ground
- Erosion - build porous rather than concrete structures
- Erosion - use rye-corn to prevent minor erosion
- Weedy trees - remove ash trees immediately, phase out other species
- Weeds - don't fight them, eliminate them
- Weeds - remove them early and often
- Regeneration - learn to recognise and protect regenerating native plants
- Planting - propagate local species from local seed sources
- Planting - chose species to match existing water regime not the pre-European water regime
- Management - prune and cut back to maintain aesthetics

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