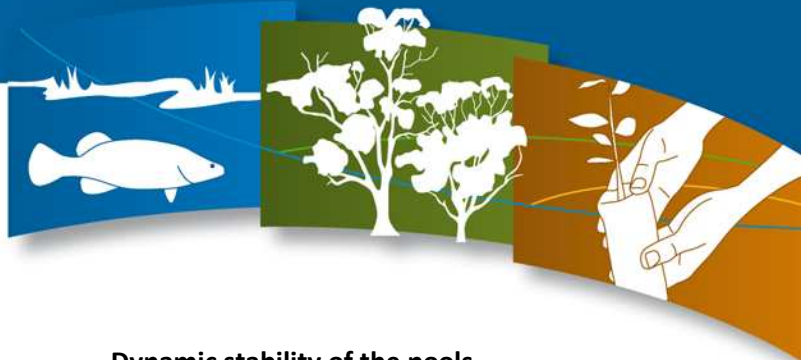


Improving Health of Avoca Reach 7

The health of deep pools in Avoca Reach 7 – Summary

PROJECT FACT SHEET



Connecting Rivers, Landscapes, People

About the Project

The *Improving Health of Avoca Reach 7* project aims to protect and enhance the Avoca River between Avoca and Archdale Junction. Its primary focus is to fence the river and upstream tributaries, including Mountain and Fiddler's creeks to protect riparian zones, which in turn protects the water quality in the river.

Computer modeling of potential fencing suggests the project can reduce erosion and sediment in Reach 7 by over 300 tonnes per year. This will protect in-stream habitat and reduce in-filling of the six deep pools within Reach 7.

To better understand the deep pools in Avoca River Reach 7 the North Central CMA commissioned a study to determine their current condition and any threats posed to their health.

Avoca River Deep Pool Investigation

In 2011 the North Central CMA engaged Sinclair Knight Merz and Austral Research Consulting to undertake a study of a series of six deep pools on the Avoca River between Avoca and Archdale Junction. The study investigated the stability, ecological significance and health of the pools. A brief summary of the consultant's main findings is provided here. The complete documentation is available upon request.

Pool formation

Pools form as a result of bed scour processes that occur during flow events. Scour processes are enhanced in areas where there is greater confinement of flow or increased channel curvature. Vegetation, in particular River Red Gums at channel margins and large woody debris, can play an important role in constricting flow and increasing scour to form or maintain pools within the river.

Dynamic stability of the pools

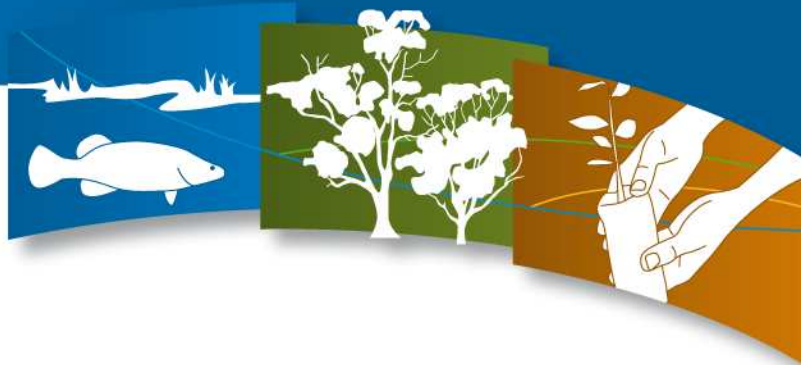
The term 'dynamically stable' is used to emphasise that the pools are not static features; they are both scouring and filling with sediment - changing over time. Variability in scour and fill leads to fluctuations in water volume and sediment storage. These processes are part of the natural flow and sediment dynamics associated with these deep pools.

Source of sediment

The consultant's investigation suggests that sediment entering and leaving the deep pools is mainly sourced from erosion of the bed and banks along the Avoca River, rather than erosion further upstream. Sandy Creek is also identified as a potential source of sediment for Pool 6.



Figure 1: Vegetation contributes to bank stability as well as the formation and maintenance of deep pools through a scour process. River Red Gums at channel margins, and large woody debris, can play an important role in constricting flow as well as increasing scour to form or maintain pools within the river.



Ecological significance of Avoca River pools

The fish and macroinvertebrate communities of these deep pools are typical of lowland Victorian rivers, which predominantly support exotic species. However some significant native species, namely Freshwater Catfish and Southern Pygmy Perch, were observed. The ecological significance of these pools stems primarily from their likely role as refuge habitat during cease-to-flow periods. River Blackfish were also observed in nearby sections of the Avoca River during surveys by Arthur Rylah Institute in November 2011.



Figure 2: River Blackfish (*Gadopsis marmoratus*) were observed in sections of the Avoca River in November 2011.

Threat: Reductions in riparian vegetation

The loss of vegetation from the banks increases potential for bank erosion which then contributes additional sediment loads to the river.

Native trees are extremely important to the health of the river. A loss of trees means their influence in confining flows and accentuating processes of bed scour and pool formation is also lost. The riparian zone is also an important source of large woody debris to the river. The shading effect of riparian vegetation is beneficial in moderating water temperatures, for the life within.

Targeting repair works

Given that sediment infilling the pools is sourced from the Avoca River and not incoming tributaries places greater focus on the implementation of waterway restoration works along the river, as opposed to catchment restoration works. Works should focus on the protection and maintenance of the riparian zone

along the river; benefitting the condition and stability of the pools, as well as water quality.

Protection of a broad riparian corridor, which allows for potential migration of the channel into areas that are currently farmland, is recommended. The width of this riparian corridor could be defined with reference to the sinuosity of the river - the corridor encompassing what is considered to be the area over which channel migration could be expected to occur.

Study recommendations

The consultants made the following recommendations for the management of the deep pools:

- Fence and revegetate along the Avoca River and its tribs, in particular in areas where there is only a narrow corridor of riparian vegetation (one tree wide).
- Restrict stock from accessing the river and make provision for stock watering points away from the river.
- Seek to increase the width of the protected riparian corridor (catchment managers in conjunction with landowners)
- Conduct further investigations in the Sandy Creek catchment to assist in targeting stream bank and gully stabilisation works.

Future directions

The North Central CMA is currently working with landholders along the Avoca River Reach 7 and tributaries to fence their riparian zones. It is expected more than 40km of fencing will be completed by 30 June 2012. Further funding is currently being sought to continue this work in 2012/13.

For further information on *Improving the Health of Avoca Reach 7* project please contact:

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