

Project 4.4

Prioritisation and effectiveness of rural land runoff control interventions

Tim Fletcher, David McCarthy, Hugh Duncan, 2 x Masters/PhD students, Toby Prosser, Rohan Hore, Joanne Thom, Rhys Coleman, Kathy Cinque, Suzie Sarkis

This project will assess the performance of interventions undertaken within the Rural Land Program to protect rural waterways from pollution, erosion and degradation. This project will also develop a pollutant source-tracking approach to identify and quantify pollutant sources and prioritise pollutant mitigation.

Outcomes for waterway management: A new modelling framework to compare and assess proposed rural land structural controls and management practices. Practical guidelines for managing drainage lines in rural and urban landscapes.

Details: Melbourne Water invests considerable funds in the management of rural runoff, to protect waterway health and quality of drinking water. However, the efficiency of such investments is potentially diminished by two important knowledge gaps:

1. There is often limited information on which to make decisions about prioritisation of pollutant sources. This means that treatment systems may be constructed in the wrong location or may tackle the “wrong problem”.
2. The performance of given treatment measures is quite uncertain.

Attempts to deal with the second area of uncertainty have often been limited by the difficulty in finding appropriate sites, and particularly by the lack of mature systems already in place.

In 2013, Melbourne Water commenced a monitoring and research program to start to address the second question. The monitoring focussed around a single property – a cherry farm – in Beenak Rd, Wandin (site referred to as “Beenak” herein). The stated intention by Melbourne Water was to add additional site(s) in subsequent years. This project will now focus on a new study catchment (Tarago), while continuing a base-level of monitoring at the Beenak site, in order to capitalise on the investment to date.

The Tarago catchment represents an ideal opportunity to address these issues, and to do so in a way that will provide lessons applicable to many open drinking water catchments, because:

1. It contains a diversity of land uses and land management, which could be used to quantify and prioritise pollutant sources;
2. Melbourne Water has implemented a range of interventions over two decades in the catchment, resulting in many mature systems which can be monitored for effectiveness.
3. Investigations and research in this catchment will further understanding of catchment management for waterway health and drinking water quality

The proposal involves collaboration between Melbourne Water, The University of Melbourne (through the Melbourne Waterway Research Practice Partnership) and Monash University.

The project is proposed to run for 3 years, being made up three components (aims), which are highly

project summary

integrated and inter-dependent.

1. Develop and test a **pollutant source-tracking** approach to identify and quantify pollutant sources within a mixed land-use catchment, and to prioritise the mitigation of key pollutant sources.

This component will focus on understanding pollution sources and developing a spatially relevant prioritisation tool for mitigation efforts. We will achieve this through a combination of monitoring and modelling methodologies.

2. **Measure the performance** of commonly-applied rural land interventions

This component will take advantage of the excellent opportunity to monitor mature rural runoff control measures within the Tarago catchment, using a BACRI (Before-After-Control-Reference-Intervention) experimental design. It will target riparian buffer planting, given (i) its widespread use within Melbourne Water's RLP and (ii) the availability of such systems within the Tarago catchment. With monitoring involving flow measurement and water quality sampling.

3. Develop a **spatial prioritisation modelling tool** for implementation of RLP interventions and a user-friendly tool for predicting the performance of individual interventions or a collection of interventions.

It is proposed that the two models developed in Component 1 and Component 2 will be joined so that the project can accurately model (1) sources of pollution and (2) treatment of these sources using Runoff Control Measures. This modelling tool will be spatially explicit and will enable Melbourne Water to conduct accurate hypothesis testing scenarios, to help them better determine the most effective and efficient mitigation.



