

Project 3.2

Catchment-scale retrofit: experimental assessment of the ability of new multi-scale urban stormwater management approaches to protect the hydrology, water quality and ecology of receiving water ecosystems.

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This project will test the effectiveness of dispersed, catchment-scale stormwater retention, treatment and harvesting. It also seeks to understand the factors influencing the maintenance of dispersed stormwater control measures on both public and private land. Social and economic implications will be assessed through collaborations.

Outcomes for waterway management: Determine the optimal scale and arrangement of stormwater treatment and retention systems to achieve stream protection.

Details: This project continues and builds on the Little Stringybark Creek (LSC) and Dobsons Creek projects, to test and demonstrate the effectiveness of dispersed, catchment-scale stormwater retention, treatment and harvesting. We aim to complete implementation and monitor the effect of catchment-scale retrofits on stream ecology, working in complement with related projects such as the Wicks Reserve monitoring programme (Project 2.5). In addition to long-term ecological monitoring the project includes the operation of an intensive multiple-scale hydrological monitoring network to determine the optimal scale and arrangement of stormwater treatment and retention systems to achieve stream protection. Social and economic implications of these projects will be assessed through collaborations. The project also includes investigations to understand factors influencing the maintenance of dispersed stormwater control measures on both public and private land.

A large, diverse and very important set of data is being collected as part of this project; these data will allow Melbourne Water to determine if these catchment-scale retrofits are successful in improving the ecological condition of Little Stringybark and Dobsons Creeks. In doing so, they will provide important information to Melbourne Water and its stakeholders, including government and the community.

This is a Before-After-Control-Reference-Intervention (BACRI) study involving a total of seven study catchments:

- The Little Stringybark and Dobsons Creek as the 'intervention' catchments
- Brushy and Ferny Creek as 'control' catchments (already degraded)
- Lyrebird, Olinda and Sassafra as 'reference' catchments (undegraded).

We will monitor the restoration trajectories of the two intervention catchments in response to implementation of stormwater control measures (e.g. stormwater harvesting, bio-infiltration, etc) dispersed throughout their catchments. By having the control and reference creeks as comparisons, we can have more confidence that any changes we see over time are indeed due to our interventions, rather than due to external influences such as climate (because these should act equally on all six catchments).

The monitoring includes ecology, water quality and hydrology. Ecological monitoring includes spring and autumn macro-invertebrate and algal assemblage sampling, along with fish surveys (undertaken annually). Ecosystem process monitoring will be undertaken, including the breakdown rate of leaf materials.

Assessment of the maintenance of stormwater control measures within the catchment-scale retrofits will be carried out through one PhD project, with a “social enquiry”.

