Case study: Jamison catchment streets to creeks project

COUNCIL NAME
Blue Mountains City Council

WEB ADDRESS
bmcc.nsw.gov.au

SIZE
1,430 square kilometres

POPULATION
76,904

Overview

A pollution event in Wentworth Falls resulted in the largest crayfish kill in the Blue Mountains with over 1000 freshwater crayfish and other macroinvertebrates killed along 2 kilometres of Jamison Creek. The cause was the pesticide bifenthrin being conveyed directly to the waterways via a concrete stormwater system.

Blue Mountains City Council partnered with WaterNSW to construct stormwater biofiltration treatment systems at key nodes within the Jamison Creek catchment to protect the instream biodiversity, the downstream World Heritage National Park, and Sydney's drinking water supply. Council also initiated a number of community citizen science initiatives at Wentworth Falls Lake to raise awareness including waterways festivals, catchment crawls, creation of a new all access boardwalk, lookout and amenties block which incorporates Aboriginal art and messenging. These biofiltration systems will prevent future pollution incidents from being so detrimental.

Background

Following the crayfish kill along Jamison Creek, Council investigated the best long term solutions to prevent urban runoff pollutants from entering the waterways. One of the long term solutions identified in Council's Water Sensitive Blue Mountains Strategic Plan is to disconnect the traditional stormwater systems to prevent them from directly entering creeks by constructing biofiltration (raingarden) systems at urban natural interface.

The Jamison Catchment Streets to Creeks Program (JCSTCP) seeks to achieve this through community engagement and installation of stormwater biofiltration treatment systems throughout the catchment. Rationale for this approach includes:

- The aquatic biodiversity of Jamison Creek dramatically declined following the pollution incident (from 22 taxonomic families down to 3);
- The catchment has been highly impacted by point and diffuse sources of pollution and urban runoff including sewage leaks and overflows, business runoff from town centres and residential runoff;
- The catchment is home to a number of threatened species and Endangered Ecological Communities, including the Dwarf Mountain Pine, Giant Dragonfly, BM Water Skink, Eucalyptus Copulans, and Temperate Peat Swamps on Sandstone (TPSS);

Figure 1: Dead and dying crayfish along Jamison Creek

- The creek flows into the World Heritage Area downstream and empties into Lake Burragorang, the primary source of drinking water for over 4.5 million people in Sydney;
- Jamison Creek has high tourism visitation.

WaterNSW's Pollution Source Assessment Tool identified Jamison Creek as a high risk for phosphorus, nitrogen and suspended solids. Council successfully applied for funding from WaterNSW under its Priority Pollutants Program, matched by Council.

Implementation

The program contributes to Objective 1.2 of Sustainable Blue Mountains 2025–'The health of waterways and water catchments is maintained'. One of the strategies outlined in response to this objective is to 'Protect, maintain and enhance the health of the City's natural waterways and water catchments'.

Outcomes

The project has resulted in significant multiple benefits to the community, the downstream World Heritage environment and drinking water catchment, liveability and local economy through improving the water quality, enhancing the ecosystem services and liveability of the Jamison Creek catchment with the following achievements:

- Two new Baramy GPT's installed in catchment;
- 15 new stormwater biofiltration systems were constructed;
- 10,000 plants, with 4 Bushcare/Landcare groups involved in planting and ongoing maintenance;
- New boardwalk and viewing platform installed at Wentworth Falls Lake;
- New interpretive signage reflecting importance of waterways to local Aboriginal communities;
- A new amenities block was constructed using local Aboriginal artwork;
- The University of Melbourne's study of pesticides showed that bifenthrin was found in all of Council's waterways (urban creek syndrome) reinforcing how important the biofiltration treatment systems are;
- A crayfish survey conducted in November 2018 found 2 species of native freshwater crayfish with the first re-appearance of 'berried' (egg carrying) females;
- 'Connecting Communities & Kids with Creeks & Catchments' program Council ran a Lake Waterways Festival, catchment crawls and Bioblitz community and school's citizen science events with over 1000 community participants.
- MUSIC modelling estimated that the annual capture of suspended sediments, nitrogen and phosphorus would be over 900kg per year. Water quality monitoring sites were installed at key nodes. In addition, flow gauging was installed to enable load estimates to be measured. Regular monitoring will continue for another year and community monitoring will be ongoing.
- Preliminary results show:
- 55% - 95% reduction in suspended solids
- 35% - 80% reduction in total phosphorus
- 20% - 60% reduction in total nitrogen
- 50% - 90% reduction in faecal coliforms
- Reductions in pollutant loads draining to the Blue Mountains World Heritage Area and to the drinking water supply for over 4.5 million people provides significant benefits to the community.

Key Learnings

The key learnings include the stark realisation about how fragile aquatic systems are to urban runoff and that a single pollution incident can have devastating effects. This highlighted the need to design robust and resilient stormwater systems that include biofiltration that can treat the plethora of nutrients, bacteria and other pollutants such as bifentrin from an urban area that is contiguous with a World Heritage area and a drinking water catchment.

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This project was the 2019 winner of the Natural Environment Protection & Enhancement: On-Ground Works Award at the LGNSW Excellence in the Environment Awards

Figure 2: Central Park raingardens in flow