Project Summary

W3: Sunbury & Headwaters: Protecting Sunbury streams and headwaters from urbanisation.

Objective(s)

This project will contribute to: i) testing if stormwater runoff can be adequately retained, used and treated to protect stream ecosystem structure and function; ii) the development of key conceptual models of headwater stream ecosystem structure and function; and iii) identification of the key drivers and mechanisms of headwater stream degradation.

Why this research is important

The distributed harvesting, infiltration and treatment of urban stormwater close to source and across large spatial scales for the purposes of stream protection is a central tenet of the HWS. Yet up until now there has been no demonstration project that clearly illustrates this is possible in the context of urbanizing areas. The Sunbury IWM and its associated monitoring program is a critical demonstration project that will prove the science and provide a strong and defensible case for the continued application of IWM approaches for new developments both in stormwater priority areas and across the MW management region more broadly.

Headwater streams make large contributions to regional biodiversity and provide the dominant source of water, sediment, and organic matter, and are critical filters of inflows. Despite their importance, research is lacking on the mechanisms and fates of headwater streams, particularly in urbanizing areas. There is insufficient understanding of key fundamental processes, how they vary in response to climatic and geographic variability and how they respond to the application of current approaches to stormwater control and other land-use management practices. This lack of understanding places their protection at risk, because it means that Melbourne Water and its stakeholders are currently unable to demonstrate how and if, headwater streams can be protected in the face of urban development.

Contribution to Melbourne Water research priorities

- MWRPP 10 (SW7, SW11, SW12, SW13, SW17) Optimum combination of centralised and decentralised stormwater control measures (SCMs) to achieve Healthy Waterways Strategy stormwater harvesting and infiltration targets and protect headwater streams.
- MWRPP 11 (H5, H6) Better understanding of relationship between hydrology and key environmental values to help set environmental flow objectives.

Approach

The project will be delivered as two sub-components:

- For the **Sunbury IWM Project**: i) continuation of the monitoring program, including water quality, hydrological and biological data; and ii) initiate/expand on a combined assessment of channel physical form and in-channel vegetation.
- Continuation of the **Headwater Stream Monitoring** program (established in the previous round of the partnership), as well as the analysis and publication of existing data.

Key Outputs

- Publication(s) on the effects of land-use change on headwater stream ecosystem structure, function and hydrology.
- Publication(s) on the effects of large scale distributed SCMs on the protection of headwater stream ecosystem structure, function and hydrology.
- Publication(s) and internal reports on the interpretation of indicators of ecosystem function.

Expected benefits

- Support the preparation of Drainage Schemes and Precinct Structure Plans, and to communicate objectives to developers.
- Provide a database of data on the structure, function and hydrology of headwater streams through time.
- Support the identification of solutions to achieve HWS stormwater targets.
- Use evidence-based approaches to update UPD guidelines to better protect headwater streams from urban and agricultural development.
- Facilitate the selection and interpretation of functional indicators for the next HWS.

Project teams

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