Project Summary

W16 Instream Vegetation: Understanding the drivers of instream vegetation distribution and management opportunities

Objective(s)

To build on the current (limited) knowledge on instream vegetation and develop tools that will enable Melbourne Water to incorporate instream vegetation as a key value in the next Healthy Waterway Strategy.

Why this research is important

Instream vegetation is a critical component of stream ecosystems. It plays an important role in abiotic processes such as sediment dynamics and stream hydraulics. It is an important contributor to stream primary and secondary productivity, and also provides food, habitat and shelter for stream biota from all trophic levels such as algae, fungi, bacteria, macroinvertebrates and fish.

Despite its importance, we lack an understanding of the distribution and drivers of instream vegetation across the Port Phillip and Western Port (PPWP) region. This project focuses on building foundational knowledge and co-developing tools and approaches that will enable Melbourne Water to better understand instream vegetation distribution, dynamics, response to urbanization and restoration by active and passive means. This knowledge and capability will support the goal of incorporating instream vegetation as a key value in the next Healthy Waterway Strategy

Contribution to Melbourne Water research priorities

- MWRPP-2 (B3, B4, RV11): Investigating streamside and instream habitat restoration activities and outcomes for key environmental values.
- MWRPP-9 (RV1, RV5, RV14, RV15): Opportunities to incorporate instream vegetation into future Healthy Waterways Strategies.

Approach

This project will be delivered through two work programs:

- Trialing revegetation methods to restore instream vegetation. To address the lack of knowledge around identifying appropriate instream revegetation sites, selecting appropriate species to plant, planting techniques and methods.
- DNA metabarcoding plants from bulk freshwater macroinvertebrate samples & instream plant habitat suitability modelling. Using existing collected samples, investigate the composition of instream vegetation at ~250 unique sites across Melbourne's waterways.
- Temporal monitoring of instream vegetation. Resurvey of sites with existing baseline data, to assess instream vegetation change over time and in response to flow.

Key Outputs

- Report consolidating knowledge about past attempts at instream revegetation and important lessons
- Guidelines on identifying appropriate instream revegetation sites, selecting species for planting and planting techniques and plant placement within candidate sites for instream revegetation.
- A method for identifying instream plant composition in waterways where there has been bulk macroinvertebrate sampling & metabarcoding.
- Report on temporal monitoring of instream vegetation

Expected benefits

- Shared knowledge base and resource of what has been attempted with respect to instream revegetation in a range of environmental settings and operating conditions.
- Greatly enlarged presence-absence dataset of instream plant species for developing first-cut instream plant habitat suitability models.
- Ability to quantitatively capture relationships between instream plant species presence-absence and environmental descriptors
- Improved understanding of the drivers and rate of instream vegetation changes over time.
- Ability to use instream plant HSMs to predict probability of occurrence at unsampled waterway reaches

Project teams

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