

Spatial prioritization of management actions for biodiversity outcomes in streams & wetlands

Project A1: Prioritization

This project will provide Melbourne Water with tools to help decide where investment in stream and wetland protection and improvement works is likely to provide greatest benefit in the context of urban growth.

This project builds on existing spatial planning tools (e.g. MW region stream network and subcatchments spatial dataset, instream Habitat Suitability Models (HSMs) and Zonation) that allow different planning options and their associated costs and outcomes to be evaluated and prioritized.

These tools were recently used during the development of the new Healthy Waterways Strategy for streams to assess current condition, the potential impacts of urban growth and climate change, to evaluate the most cost-effective management actions and set management long-term targets.

This project will develop equivalent HSMs for wetlands to provide a similar level of rigour to wetland planning decisions. Existing stream models will also be strengthened via the incorporation of new spatial datasets and environmental predictors.

A major focus of this project will be the development of spatial data infrastructure for fine-scale mapping of wetlands (waterbodies) in the MW region, and for enabling the development of habitat suitability models for wetland-dependent fish, frogs and birds.

Methods

The stream and subcatchments dataset will be extended to include headwater streams delineated with a minimum area of 1 hectare. Environmental predictors will be derived for the updated dataset, and biological data will be matched to

the new network.

HSMs for as many instream taxa as possible will be validated using independent survey and eDNA data.

The project will delineate catchment areas for all waterbody types where the notion of a 'catchment' is meaningful. It will collate, prepare and investigate a range of environmental spatial data to populate the waterbodies dataset with predictors relevant to management interests and of utility in fish, frog and bird habitat suitability modelling.

A key task will be the development of potential management actions that MW intends to apply at wetlands, along with a process-based understanding of the costs of these actions and factors governing their spatial variation across the MW region.

Finally, the systematic conservation planning software, Zonation, will be used to analyse and rank action priorities for wetlands across the MW region.

Outcomes

The HSMs for wetland biota will be used to: a) illustrate where wetland taxa of interest occur in the landscape; b) assess and illustrate the effects of broad-scale impacts such as climate change and land use change on wetland taxa habitat suitability; and c) develop a quantitative action prioritization (analysis using Zonation) to cost-effectively maximise biodiversity outcomes in wetlands at the whole-of-region scale.

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