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

This project will develop 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 and climate change.

Project Team:

University of Melbourne
Yung En Chee
Chris Walsh
Jasper Kunapo
Matt Burns
Ryan Burrows

Melbourne Water
Rhys Coleman
Will Steele
Sharyn RossRakesh
Paul Rees
Marion Urrutiaguer
Grace Tjandraatmadja
Trish Grant

External
Nick Bond & Michael Shackleton (La Trobe)
Bex Dunn (Geoscience Australia)

This project (which commenced in Dec 2018) will support critical short-term needs such as annual works planning activities, and the development of the detailed MERI and monitoring and reporting activities that will support delivery of the HWS (see Project A2 MERI). It will also support strategic (longer-term) activities such as MW's Pricing Submission to the Water Price Review process conducted by the Essential Services Commission, and the development of the next HWS.

This project builds on existing spatial planning tools that allow different planning options and their associated costs and biodiversity outcomes to be evaluated and prioritised. These tools were successfully applied in the community co-development process of Melbourne's Healthy Waterways Strategy 2018

The proposed next steps in this proposal are to develop Habitat Suitability Models (HSMs) for wetlands (i.e. fish, frogs and birds) to provide a similar level of rigour to wetland planning decisions. These 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 prioritisation to cost-effectively maximise biodiversity outcomes in wetlands.

We also propose to improve the existing instream HSMs with the incorporation of updated biological datasets, new spatial datasets and updated environmental predictors.

Methodology

In the coming year, the project will focus on:

- Updating stream network spatial infrastructure, environmental data & instream biota HSMs.

- Consolidation of waterbodies spatial data infrastructure, environmental data & wetlands biota HSMs

- Development of potential management actions that Melbourne Water 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.

- Investigate the feasibility of developing region-specific Climate Change datasets and modelled inputs to support the rigorous assessment of the long-term impacts of climate change on aquatic biodiversity in streams and wetlands.

Expected outcomes

- Ability to quantify the difference made by management actions (in terms of change in habitat suitability).

- Understanding of the distribution of the most cost-effective Action at reaches across the MW region

- Multiscale spatially-explicit data on reaches (assets) that can be used to characterise relationships & environmental condition.

- Understanding the risks and trade-offs of various waterways and drainage investment strategies for the MW region to support the bid to the Essential Services Commission.

Melbourne Water
Enhancing Life and Liveability

WATERWAY ECOSYSTEM RESEARCH GROUP

Melbourne Waterway Research-Practice Partnership
Research for the improved management of Melbourne's waterways

mwrpp.org