

W5 Modelling Waterway & Wetlands: Development and application of stream and wetlands habitat suitability models (HSMs) to support Healthy Waterways Strategy

Objective(s)

To combine best-available biological and spatial data to continuously improve models, tools and capabilities to support defensible, cost-effective prioritisation of management actions for waterways and wetlands taking into account future threats and risks to support the development and review of the Healthy Waterways Strategy

Why this research is important

Accurate spatial datasets of stream networks and waterbodies previously developed or improved by the MWRPP provide critical data for mapping, visualisation and performance reporting at multiple levels of aggregation. Environmental data libraries associated with stream networks and waterbodies spatial data provide a rich set of utility and environmental descriptors which are an ongoing research & management resource with multiple uses.

These data can be used to develop a range of tools such as HSMs and to drive applications such as formulating management actions, designing scenarios of interest, and action prioritisation to guide Healthy Waterways Strategy planning and target-setting.

These tools and capabilities support continuous improvement of HWS implementation by providing an advisory and critical review role in the MERI Framework and the Rivers, Wetlands and Estuaries Monitoring and Evaluation Plans (MEPs). They also support strategic activities such as HWS Mid-term Evaluation and forthcoming activities such as MW's Pricing Submission to the Essential Services Commission (~2026).

Contribution to Key Research Areas

- Wetlands & estuaries:
Developing strategic decision-making tools and frameworks for the prioritisation of management interventions for wetlands and estuaries.

Achievements to date

- Updates to the Melbourne Water Stream Network, including impervious cover and related metrics.
- Optimization analysis to identify the optimal weighting parametrization for attenuated forest (AF) and effective imperviousness (EI).
- Presentations at the 11th Australian Stream Management Conference 2024 on contribution to the HWS Mid-term Review.

- Contributions to Melbourne Water's adaptive planning for stormwater management

Approach for year 3

Continued work on the foundations of biological and spatial data, as well as tools and applications such as HSMs for instream and wetland-dependent biota and exploration of management actions for wetlands.

Specific tasks for Year 3 will include:

- Review of the current approach to quarterly Board Reporting on Waterway Condition and develop a new proposal to track waterway health for the purpose of reporting on the Risk Appetite Statement to ensure that it is fit for purpose.
- Workshop to develop a shared understanding and plan for what analyses are desired for End-of-Strategy and new Healthy Waterway Strategy 2028.
- Workshop to identify candidate management actions for streams and waterbodies for Healthy Water Strategy 2028.

Key Outputs for Year 3

- Identification of alternative options for indicators and metrics for reporting on waterway condition.
- Clear, shared understanding of candidate management actions, what they involve & where &/or under what conditions each is applicable.
- Foundation for developing process-based, unit-level costing of candidate actions for a wide range of applications
- Clear, shared understanding of scenarios of interest, what they involve, method of construction, assumptions & limitations.

Expected benefits

- The ability to predict habitat suitability of instream and wetland biota in streams and wetlands throughout the region.
- Better understanding of candidate management actions and determinants of where they are likely to be suitable/not suitable to apply.
- Ability to explore management options of strategic concern from the perspective of stream or wetland biota habitat suitability.
- Identification of the most cost-effective action at stream reaches or wetlands at landscape scale.

For more information

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