Habitat Suitability Models are powerful tools for helping diverse stakeholders agree on stream restoration priorities.

INTRODUCTION
We developed spatially explicit, quantitative models and applied conservation prioritisation software (Zonation) to support stakeholder deliberations to identify priority actions and targets in Melbourne’s new Healthy Waterway Strategy.

METHODS
We developed Habitat suitability models (HSMs) using extensive ecological data collected between 1995-2009 for 52 macroinvertebrate families, 13 native fish species, and platypus.

Combined with 10-12 candidate environmental predictors (e.g. air temperature, runoff depth, impervious cover, vegetation cover) we used Boosted Regression Trees to predict habitat suitability across a >8,000-km stream network.

The benefit of management actions (e.g. stormwater disconnection, streamside revegetation, environmental flows, fishways) in isolation or combination, was compared to a Business-as-Usual Future scenario (assuming past practice with anticipated urban growth and a drier, warmer climate).

We then used Zonation to prioritise cost-effective management actions to optimise protection and restoration of instream biodiversity.

RESULTS/DISCUSSION
Benefits of this approach included:
- spatially continuous estimates of biodiversity
- ability to consider potential interactive impacts of future threats
- ability to quantify expected differences made by individual or combined management actions
- prioritisation based on cost-effectiveness
- ability to spatially prioritise management actions and set quantitative management targets
- mapping outputs were an effective way to summarise and communicate data to different audiences during the strategy co-design process.

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