CRC for
Water Sensitive Cities

RESTORE Tool evaluation—Scrubby Creek pilot application

Location:
Logan, Queensland, Australia

Case Study — Prepared by Cooperative Research Centre for Water Sensitive Cities, June 2020

Australian Government
Department of Industry, Science, Energy and Resources
Business Cooperative Research Centres Program

Insight

The RESTORE Tool improves the planning of waterway restoration projects by using:

- ***collaborative processes that give deeper insights into problems at a site***
- ***desktop methods that reduce the time required to diagnose a site's issues and to identify appropriate actions***
- ***repeatable procedures that ensure the results are evidence based, transparent and accurate.***

Project description

RESTORE is a decision making tool to support the repair of urban waterways. The tool asks practitioners a range of questions about the environmental and urban setting of their restoration site and identifies the ecosystem components likely to be most relevant.

The CRC for Water Sensitive Cities engaged E2DesignLab to test the tool in a real world situation. It was applied to four waterway sites in the Scrubby Creek Catchment in Logan City in Queensland (identified through Logan City Council's *Scrubby Creek Recovery Plan*). The sites differed in their characteristics, location within the catchment and their potential for restoration:

- Gould Adams Park
- JJ Smith Park Lakes
- Hawthorn Park
- Grand Plaza site.

→

Gould Adams Park

The drivers

Demonstrating and refining the tool supports broader industry uptake

- Test and evaluate this tool by comparing tool outcomes with activities proposed in the Logan City Council's *Scrubby Creek Recovery Plan*
- Refine the tool and improve ease of application
- Identify solutions for the Scrubby Creek project
- Demonstrate application of the tool to build confidence and help drive broader industry uptake

What does this case study demonstrate?

Each case study has been selected to demonstrate specific solutions, benefits or enabling structures that support the creation of water sensitive cities. This case study focuses on:

Waterway naturalisation

Ecosystem health

Evaluation frameworks

The innovations

The tool facilitates a decision process that considers all aspects of the waterway and its catchment

Desktop assessment of waterway ecological components – The RESTORE Tool guides a desktop assessment of nine ecological components of urban waterways:

- hydrology
- geomorphology
- longitudinal connectivity—connectivity from upstream to downstream
- lateral connectivity—connectivity with the floodplain and wetlands
- vertical connectivity—connectivity with underlying groundwater systems
- riparian zones
- physico-chemical water quality
- nutrient water quality
- biota.

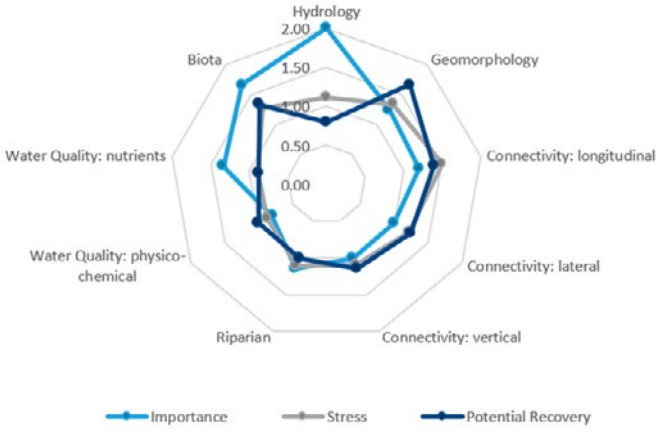
The question based approach enables waterway managers to tap into existing knowledge and expertise without having to do detailed site investigations.

Scoring approach identifies priority key ecological components – The tool ranks each of the nine ecological components in relation to importance, severity of stress and potential recovery. A high overall prioritisation score indicates the ecological component is highly altered, has a significant influence on the ecosystem function and has a good capacity for recovery.

Supporting factsheets identify potential recovery actions – The supporting factsheets—*Improving the ecological function of urban waterways: a compendium of factsheets*—identify potential recovery actions that could be considered for addressing each of the priority ecological components.

Pilot application allowed comparison of different approaches – The tool was applied in a series of steps for the Scrubby Creek project:

1. Sole application of the tool: An individual waterway practitioner applied the tool using available desktop information and knowledge to answer the questions as best they could.
2. Team based application of the tool: The tool was applied again in a team workshop, to improve the rigour of the results.
3. Analysis: The results using the tool were reviewed to confirm priority ecological components for each site were suitable.



Results spider diagram for Gould Adams Park ↑

4. Identification of actions: The factsheets were used to identify potential actions at each site.
5. Comparison: The priorities and actions identified using the tool and accompanying factsheets were compared with those already developed during the *Scrubby Creek Recovery Plan* project to test the tool's validity.

Scientific evidence challenges perceptions and biases: A wealth of scientific evidence supports the questions and development of the tool, and forces professionals to evaluate their own assumptions, challenging perceptions and biases. It includes questions that may otherwise be overlooked. This scientific base also makes the tool a highly valuable educational tool and literature source.

Top: Grand Plaza site—water quality sampling location infested with Singapore daisy; bottom: JJ Smith Park ↓

The outcomes

This snapshot of outcomes shows how the different priority ecological components for the four Scrubby Creek sites can be improved by undertaking actions recommended in the RESTORE Tool supporting factsheets (see More information below).

Cities providing ecosystem services	Cities as water supply catchments	Cities comprising water sensitive communities
Geomorphology: • Naturalise and stabilise channels and improve channel structure Connectivity and riparian: • Remove barriers, rehabilitate riparian corridors and raise channel bed levels Biota: • Improve in-stream habitats and remove invasive pests	Hydrology: • Harvest, infiltrate and detain stormwater flows in rainwater tanks etc. to reduce catchment flows entering the waterways • Repair leaks from water supply and wastewater infrastructure	• Build knowledge of the key waterway issues and opportunities, by fostering collaboration among multiple stakeholders via the tool application process • Encourage local community involvement in actions (e.g. revegetation, monitoring) and improve amenity

Business case

Costs	Benefits	
• Currently, it takes approximately 2–4 hours to assess each site using the RESTORE Tool. Identifying suitable actions using the supporting factsheets takes extra time.	• Rapid assessment – Its desktop simplicity makes the tool useful when budgets and resources are not available for complex site-based technical assessments.	• Tailored restoration plans –Restoration plans can be tailored, to prioritise investments that will provide the greatest return on waterway repair.
	• Stakeholder engagement – The assessment process brings together a range of stakeholders who have good site knowledge. This collaborative approach builds good working relationships, and internal capacity and knowledge.	• Transparent and consistent assessment – The framework for assessing waterways can be repeated across multiple sites. This removes bias and provides a robust justification for investment in waterway health improvement.

The lessons

- **The tool is most effective when applied in a facilitated workshop environment** – The results depend on the knowledge and experience of the user and their familiarity with the assessment site. This supports using the tool in a group setting, bringing together diversity of knowledge. Input from many disciplines is needed to maximise confidence in results. It encourages collaboration to successfully respond to all questions. The large number of questions could make this task difficult, especially if assessing multiple sites.
- **It has a specific purpose and scope** – The tool was developed for flowing freshwater systems where ecological improvement is a key goal. It should be used with other processes to achieve broader outcomes for the site (e.g. recreational / social outcomes).
- **Local knowledge can be used to customise the tool** – The tool assigns equal weighting to each ecological component. It is recommended that experts involved in the assessment examine the underlying scoring methods to assign weightings as required. This weighting should be applied consistently among criteria within an ecological component.
- **The tool does not explicitly consider the cost of management actions** – Other benefit–cost analysis tools may be useful to further prioritise actions. Alternatively, recovery potential may serve as a proxy for costs and be considered through the process.

Transferability

The tool can be applied to any urban waterway. It will become more robust, efficient and effective over the long term.

Project collaborators

- The University of Western Australia
- E2DesignLab
- Logan City Council

More information

- RESTORE Tool evaluation—Scrubby Creek pilot application
- Improving the ecological function of urban waterways: a compendium of factsheets
- RESTORE Tool profiled at Riversymposium

Cooperative Research Centre for Water Sensitive Cities

Level 1, 8 Scenic Boulevard
Monash University
Clayton VIC 3800

info@crcwsc.org.au

www.watersensitivecities.org.au

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