



CRC for Water Sensitive Cities

Wanyarram Dhelk—Bendigo Creek restoration

Location: Bendigo, Victoria



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



Business Cooperative Research Centres Program

Insight

Traditional ecological knowledge, combined with water sensitive design, can restore cultural, social and environmental values to a degraded urban creek

Project description

Wanyarram Dhelk—which means Good Waterhole in Djaara language—aims to improve the water health of the Bendigo Creek and its tributaries. It started in 2016 as a partnership between Dja Dja Wurrung Enterprises (an arm of the Dja Dja Wurrung Clans Aboriginal Corporation) and the North Central Catchment Management Authority (the agency responsible for natural resource management in north central Victoria). In 2018 Dja Dja Wurrung Enterprises was granted \$500,000 by the Victorian Government to complete Wanyarram Dhelk Phase 1 and 2 on Country, with Dja Dja Wurrung Enterprises leading and delivering all aspects of the project.

Phase 1 of the project reintroduced ponds into the Bendigo Creek, to mimic what the creek once was—a chain of ponds. A sequence of alternating pools and riffles along the length of the creek was engineered and implemented in-stream. The deeper pools trap sediment (which was making the water sick), and mimic pond habitats for animals while also improving amenity. Water moving over the shallow, rough riffle sections is more turbulent and becomes enriched with oxygen, and returns sound to the system and onto Country, while also providing habitat for frogs.

Phase 2 involves intercepting stormwater runoff, and channelling it through the chain of ponds, to remove

pollutants such as phosphorous and nitrogen which are attached to sediment, and to also reduce turbidity. Granite walls between each pond trap and slow water, which causes sediment to settle to the bottom. This water then passes through sections of the water course that are planted with traditional food and fibre plants recognised for their customary use. This process of slowing down and healing the water improves the health of downstream sections of Bendigo Creek.

The Dja Dja Wurrung project is a flagship initiative for the Victorian Government, supporting Traditional Owner led water sector collaboration. It is also one of the priority actions of Water Sensitive Bendigo, a collaborative process to drive Bendigo's transition to a water sensitive city. This cross-agency partnership developed in response to the CRC for Water Sensitive Cities' research project to develop a vision and transition strategy for a water sensitive Bendigo. The research project was completed in 2018, and now stewardship for Bendigo's transition has passed to this cross-agency partnership.



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:

Amenity and urban greening

Community engagement

Ecosystem health

Waterway naturalisation

Leadership and influence

The Water Sensitive Bendigo Implementation Plan outlines the immediate priority actions, as well as aspirational actions, which will be a foundation for future activities. The plan allows Bendigo to respond to, and prepare for, emerging water management challenges such as climate change and population growth, and facilitates innovative practices and management. Implementing phase 2 of Wanyarram Dhelk is priority action 5.

The drivers

- **Improve the cultural values of the Bendigo Creek and create opportunities for Djaara people to actively participate in healing Country through on-ground project delivery**—All areas on Country are culturally significant. The project creates opportunities for Djaara people to engage in practical activities on Country that heal Country and water. Plants used in the project can be harvested and used in traditional / customary practice (e.g. making baskets from reeds).
- **Build the capacity of Dja Dja Wurrung Clans Aboriginal Corporation and Dja Dja Wurrung Enterprises to play a leading role in protecting and enhancing the natural environment**—The project started as a joint project between the Dja Dja Wurrung Clans Aboriginal Corporation and the North Central Catchment Management Authority in 2016. Over time, Dja Dja Wurrung Enterprises has taken greater control and is now developing, leading, and implementing the design and securing funding for new phases of the project.
- **Provide opportunities for education and awareness about Dja Dja Wurrung culture**—Projects such as Wanyarram Dhelk become hubs for school groups and the broader community, demonstrating how Djarra people heal Country and water. They are also a place to share Djaara stories and culture.

- **Restore the environmental values of the Bendigo Creek**—A series of sedimentation ponds and constructed wetlands intercept stormwater, remove pollutants and discharge clean water into the Bendigo Creek.

The innovations

- **Combine Traditional ecological knowledge with contemporary design and technology in partnership**—Traditional Owner-led projects provide deeper and more layered returns to Djaara people and their investors by providing opportunities to fulfil their aspiration to heal Country and water. Dja Dja Wurrung members have deep connections with the waterways and understand how Bendigo Creek should look, smell, sound and feel. Hearing Traditional Owners say that the creek didn't smell right prompted investigations into pollutant loads entering the creek. Removing sediment and weedy in-stream vegetation has formed open ponds that sound and smell as they should, allowing the water to heal.
- **Use the Dhelkunya Dja Country Plan 2014–34 to guide on-ground projects**—This plan outlines the Djaara people's vision for Country, and describes the strategic framework of goals and objectives. The Wanyarram Dhelk project demonstrates a joint commitment to achieving these goals and objectives, which include:
 - Our rivers and waterways are healthy and meet the needs of our people and land
 - Our Country continues to nourish us by providing bush tucker and medicine
 - Dja Dja Wurrung customs and practices are alive and respected—keeping us connected to our past, our present and our future



↑ Wanyarram Dhelk - Frog Pond - storm water / sedimentation works, Knight Street Bendigo 2018



↑ Djandak team members at Koomba Street's new project healing storm water before it flows into the Bendigo Creek. Picture: NONI HYETT

The outcomes

 Cities providing ecosystem services	 Cities as water supply catchments	 Cities comprising water sensitive communities
<ul style="list-style-type: none"> • Improve water quality, by channelling stormwater through a series of sedimentation ponds and constructed wetlands • Provide important habitat for frogs and birds and the insects they feed on • Reintroduce culturally significant food and fibre plants back on to Country 	<ul style="list-style-type: none"> • Use stormwater to grow native food and fibre plants • Provide large pools for urban use, cooling down these niche environments, catching and improving wasted water 	<ul style="list-style-type: none"> • Encourage Djaara people back onto Country, to participate in projects that heal Country and water • Reinterpret healing Country and water through the lens of Djaara people • Improve awareness of cultural and environmental values within the local Bendigo community • Improve capacity of the Dja Dja Wurrung Clans Aboriginal Corporation and Dja Dja Wurrung Enterprises to lead protection and enhancement activities

Business case

Costs

- Stage 1 (\$250,000)
 - o Technical assessments and in-stream design
 - o Implementation of engineering drawings/designs
 - o Soft landscaping (grass and culturally significant flora)
- Stage 2 (\$250,000)
 - o Technical assessments and off-stream design
 - o Implementation of engineered drawings/designs
 - o Revegetation
 - o Weed control, removal and felling
 - o Community event

Benefits

- Community engagement with and awareness of traditional water management practices, food and stories
- A naturalised waterway that improves water quality, habitat, biodiversity and natural aesthetics

The lessons

- **Provide many and varied opportunities for Traditional Owners to get on Country**—The project allows Djaara people to fulfil their cultural obligations to heal Country and water. When water is healthy, plants are healthy and can be used for traditional / customary practice.
- **Gather information through deep listening**—Traditional Owners can provide deep insights into waterway health using indicators of smells, sights and sounds.
- **Gather a 'gang' or network of stakeholders to drive innovation**—Key stakeholders in Bendigo signed a Memorandum of Understanding that defines the consistent and inclusive governance to support integrated and adaptive water planning and management, and enables critical coordination and collaboration across the key agencies.
- **Align activities with supporting initiatives**—Due to its values, cross-disciplinary and collaborative nature, Wanyarram Dhelk was supported by the Coliban Integrated Water Management Forum (a region wide collaboration) and leveraged the Victorian Government's Aboriginal Water, Integrated Water Management and Waterway Health programs to achieve funding.

Transferability

This project is a good model for combining Traditional Ecological Knowledge about water management with contemporary waterway design and construction. It is also a good example of restoring a degraded urban waterway.

Project collaborators

- Dja Dja Wurrung Clans Aboriginal Corporation and Dja Dja Wurrung Enterprises
- Department of Environment, Land, Water and Planning (Victorian Government)
- City of Greater Bendigo
- North Central Catchment Management Authority

Additional information

[Bendigo Creek Wanyarram Dhelk project to restore ponds to waterway](#)

[Bendigo Creek can heal, traditional owners the Dja Dja Wurrung say, as project nears end](#)

[Wanyarram Dhelk—Bendigo Creek Restoration Project, Clearwater regional case study](#)

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