

The Living Lagoons

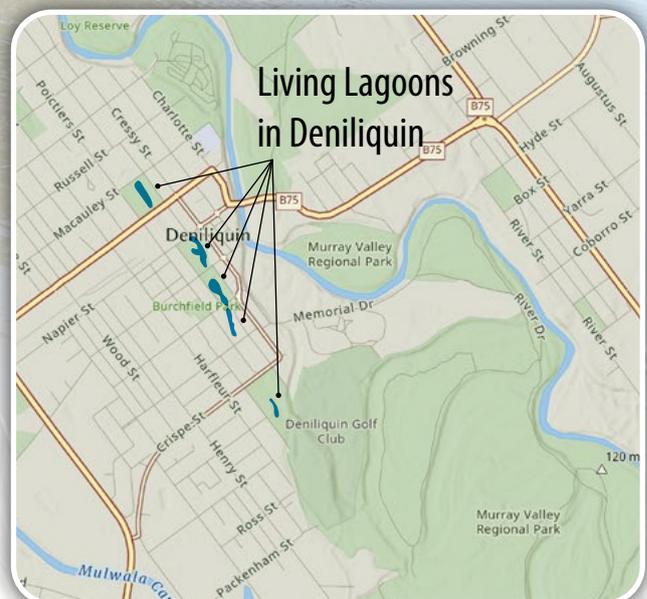
a community
restoration project

At the heart of Deniliquin

Water has always connected people for millennia and Deniliquin is lucky enough to have both a river and a wetland system running through the centre of its town. 'The Living Lagoons', is a chain of natural wetlands running south to north through the centre of Deniliquin, in Wamba Wamba and Perrepa Perrepa Country. These wetlands have been highly modified over time and form an important component of the town's stormwater drainage and flood mitigation system.

The Deniliquin Lagoons Community Restoration Project began in 2010 with the goal of restoring the lagoons to benefit both the environment and local community through active participation and engagement. This site demonstrates how connection between local people and the environment can be achieved within rural towns.

"The community is more connected to their environment through this project."



Local Land
Services

Wetland habitats

Wetlands are a critical part of our natural environment, providing an important range of environmental, cultural, social and economic services. Wetlands may be natural or artificial and the water within a wetland may be static or flowing, fresh, brackish or saline. There are even underground wetlands.

One of the most important benefits wetlands provide is their capacity to maintain and improve water quality. When healthy, wetlands have a rich natural diversity of plants and animals. These can act as filtering systems, removing sediment, nutrients and pollutants from water.

Wetlands are now one of the most threatened and degraded ecosystems in the world. This has a negative impact on wetland fauna and flora with many species now locally extinct or threatened. Communities and government are now working to restore wetlands and recover our wetland species for future generations.

When designing the Deniliquin Lagoons Community Restoration Project there was an emphasis on selecting native plants that provided good habitat, looked good and could be used for traditional cultural practices, such as weaving. Another major objective was to restore wetland habitat to create a threatened species refuge and breeding centre for threatened native wetland fish. Already there are two species breeding successfully, and there are plans for more.



Threatened species

The Living Lagoons are host to a number of threatened and iconic species including rakali (water rats), turtles, birds and fish. Wetland animals and plants were once common and plentiful in wetlands around Deniliquin, providing a critical economic and cultural base to local Aboriginal communities.

Wetland specialist fish, such as southern pygmy perch and purple-spotted gudgeons, would have been plentiful in local wetlands but are now locally extinct. These small 'wetland warriors' were important as a food source for people and other animals, and since disappearing they have been replaced by pest fish such as European carp and gambusia.

It's time to bring them back to all our wetlands in the district and the Living Lagoons are acting as a surrogate habitat for breeding wetland specialist fish to distribute into other local wetlands.



ABOVE (L-R): PURPLE-SPOTTED GUDGEON AND SOUTHERN PYGMY PERCH

LEFT: EEL-TAILED CATFISH

(PHOTOS CREDIT: MDBA © GUNTHER SCHMIDA)

Social connections

Wetlands are important social-ecological systems linking people to their environment on many levels. Local people have been connected to wetlands for thousands of years with records of wetland use and connection to wetlands dating back over 40,000 years. Historically, wetlands formed the cultural, economic and social centre for local Aboriginal people and they continue to hold that strong connection today.

The Living Lagoons are an educational area for the local community, schools and visitors as well as providing a platform for building partnerships between local government, interest groups, schools and the community.

Deniliquin High School

Education is a critical part of the Deniliquin Lagoons Community Restoration Project. The project provides a practical, hands-on learning experience for Year 10 students from Deniliquin High School. The students, school staff and members of the lagoons group work together one morning, every week, maintaining and monitoring the Living Lagoons. Outcomes include:

- Practical maintenance experience
- Foster community ownership
- Learning about local wetlands
- Learning about flora and fauna.

A great place to explore!

Restoration overview

The Deniliquin Lagoons Community Restoration Project is a community driven partnership between Deniliquin Council, Local Land Services, Yarkuwa Indigenous Knowledge Centre, Edward Wakool Angling Association, Rice Grower Association, NSW Department of Primary Industries – Fisheries, Deniliquin High School, Deniliquin Kolety Lagoons Landcare Group and other local community groups and fishing clubs. The aim of the project is to restore a series of lagoons within Deniliquin to deliver educational, ecological, recreational and tourism benefits.

The lagoon's restoration began in 2010. The first stage was to drain and remove European carp and other pest fish species. This was followed with reshaping the banks, revegetating with wetland plants, and then maintaining works.

Now that key habitat features have been restored, such as fringing and aquatic vegetation and woody debris, threatened fish species are being relocated into the lagoons from creeks where they are in decline, or from captive bred populations.

This project has been reliant upon maintaining good working relationships with the local council, State Government and a range of community groups across a wide range of components. It has been great to see what can be achieved when people work together for a common cause.



JOHN CONALLIN WITH ONE OF MANY EUROPEAN CARP REMOVED FROM THE LAGOONS, 2011

I live in Deniliquin, how can I help?



Get involved with the Deniliquin Kolety Lagoons Landcare Group or Edward Wakool Angling Association.



Look after our lagoon wildlife by keeping pets inside or on a lead when walking around the lagoons.



Become a citizen scientist! Learn about the flora and fauna and report your observations on iNaturalist.



Our lagoons are a fish hatchery so be mindful of what gets washed into the stormwater. Let's keep our lagoons clean!

I'm visiting Deniliquin, how can I help?



Help keep our lagoons litter-free and make sure all rubbish is placed within bins, or taken with you.



Learn more about the Living Lagoons by walking the trail, and reading the interpretive signs.



Take photos of the lagoons and tell others about the great work being achieved in Deniliquin.



Please pick up after your dog and don't let them swim in the lagoons, they are a fish hatchery.

Further information

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YARKUWA
INDIGENOUS KNOWLEDGE CENTRE

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5 Principles of wetland restoration

Learnings from the Living Lagoons Project



1. Social license and social connections

Social endorsement and inclusion is a key starting point and essential for gaining long term commitment and involvement. The Landholder (e.g. Local Council, Crown or private), neighbours and the broader local community (**including young people**) that live and work around the area must support the idea of the restoration project and ideally be involved in co-design of the project. **Setting clear objectives** that the community supports and understands will ensure you **create a space where the community can connect** with flora and fauna and feel a sense of well-being and ownership.



2. Water security and water levels

Depending on the objective/s of the restoration project, a **reliable and timely supply of water may be essential**. For example, fish can't live in a dry lagoon! The ability to raise and lower water levels is also important as it allows essential ecological processes to happen, such as maintaining biodiversity, recruitment of plants and animals, sediment processes, and generally providing conditions that will entice fish and other species to breed. **Wetlands have naturally fluctuating water levels**, which may include a dry period in summer or autumn. This must be done in conjunction with community education and consideration of aesthetics and well-being. No-one wants a half-drained lagoon in their town in tourist season.



3. Habitat establishment

Enhancing the physical habitat is essential and can be general or specialised to suit your target species (e.g. fish breeding logs). If possible, the **involvement of professionals with expertise in aquatic ecology** in the planning and monitoring of habitat establishment is a good idea. Social considerations are also important, for example tall reeds may suit the target species but may be unacceptable to the community as they cannot see the wetland. **Local decision making** around how it is implemented and involvement in the maintenance and monitoring helps to keep costs down and commitment high.



4. Objectives, ecological understanding and research

Have **clear objectives and an understanding** of what you want to achieve, for example, restoring the site to a particular point in time; breeding native fish; improving water quality; or involving the community in wetland restoration. A sound ecological understanding will allow you to consider potentially unwanted consequences such as increases in predators. **Connecting community involvement** in the restoration project with specialist organisations (e.g. universities, government agencies) is a great way to work on shared outcomes and for learning to occur. **Regular monitoring** allows progress to be tracked, problems to be addressed, and successes to be evaluated such as bird breeding and numbers of juvenile fish. **Citizen science** is a key aspect of these efforts.



5. Maintenance and community commitment

Wetland restoration projects require **long term commitment**. Wetlands can be designed to be low maintenance and aesthetically pleasing, but still require continual maintenance and monitoring. **Community champions** (and/or commitment from private landholders) are an important component of any restoration program as they will change much less than government or political groups and be able to keep the wetland in focus for continued funding and support. Development of an **annual maintenance program** based on the four seasons will enable larger tasks and activities to be timed to suit the season and available workforce. A **broad diversity of skill and access to equipment** is also a necessity. A great way to do this is to **involve groups such as schools**, which provide both a workforce for maintenance and learning opportunities.

BROWNS PARK LAGOON (FISH PARK)

2010 Initial discussions begin on restoration of the lagoons for social and ecological goals. Lagoons group is formed and planning begins.

2012 All lagoons drained, pest fish removed, problems identified and lagoons refilled. Funding is sought for lagoon restoration.

2014 *First Lagoon* – McFaul Park lagoon restoration occurs with bird hide built by the Mens Club. Lagoon walking tours begin, education and community events start and continue each year until present.

2015 *Second Lagoon* – Burchfields Park restoration begins and Deniliquin council wins the Natural Environment Protection and Enhancement Award at the Local Government NSW Excellence in the Environment Awards for the Living Lagoons project.

WARING GARDENS LAGOON

2016 *Third Lagoon* – Browns Park restoration begins to create a recreational fishing park called Werrpanakata, which provides a place where all people have access to enjoy fishing.

2018 *Fourth Lagoon* – Mathews Park Lagoon restoration begins and the Living Lagoons Project receives the Bill Hermiston Memorial Environment Award from the Edward River Council on Australia Day 2018.

MCFAULL PARK LAGOON

2018 The Deniliquin Lagoons group becomes an affiliated partner under Landcare and the Deniliquin High School begins an official Wednesday class where they work with group members on education and maintenance of the lagoons.

2018 Threatened eel-tailed catfish are introduced to Waring Gardens Lagoon and begin breeding within the first year. They continue to breed each year.

2018 Mathews Park restoration begins and Deniliquin High School students fabricate and install casting decks at Werrpanakata fish park.

2019 The Deniliquin Lagoons group begins collaboration with OzFish on habitat improvement in the lagoons and installs a series of fish hotels.

2020 Installation of infrastructure on Werrpanakata island begins in collaboration with Deniliquin High School, which includes the installations of paths, swamp plantings, seating, covered open learning area, a fire pit and a water aerator.

2020 Captive breeding program for threatened southern pygmy perch begins and two lots of fish are released into the lagoons. Monitoring begins in collaboration with NSW Department of Primary Industries - Fisheries.

2021 Translocation of eel-tailed catfish from the Deniliquin Lagoons into surrounding town lakes occurs to help secure more source populations.

MATTHEWS PARK LAGOON

The Living Lagoons

Before



During



After



EDWARD RIVER

Werrpanakata Fish Park

The Werrpanakata Fish Park program, located at Browns Lagoon, allows local students to work in a practical setting while contributing to the management and maintenance of the lagoons. Activities they are involved in include weed removal, fish monitoring and building lagoon infrastructure. Key ecological learning outcomes include wetland hydrology, wetland flora, turtles, small bodied fish, macroinvertebrates and water quality.

In addition to the environmental education and practical experience, the project activities were designed to also equip students with valuable, real-world employment skills, such as:

Personal conduct

- Personal attributes for success in the workplace
- Meeting and talking to people in the workplace
- Working harmoniously with others
- Being respectful of gender, age and cultural differences.

Working with others

- Working with others to solve problems
- Adapting to new situations in a flexible way
- Achieving positive results in community activities
- Building a network of contacts.

Safety and risks assessment

- Identification of common hazards
- Proposing measures for controlling a range of risks
- Identifying workplace risks, safety signs and symbols.

