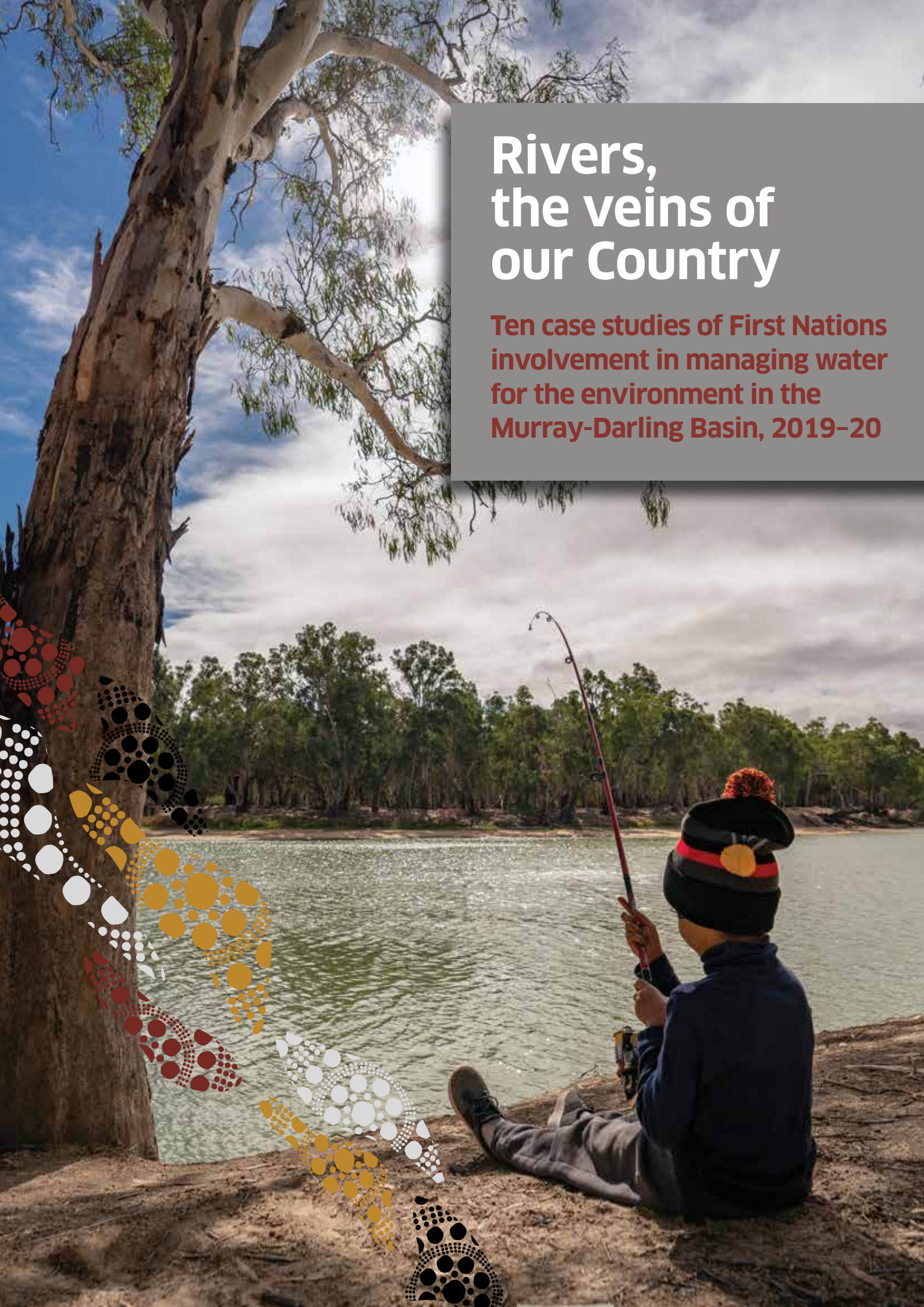

Rivers, the veins of our Country

Ten case studies of First Nations involvement in managing water for the environment in the Murray-Darling Basin, 2019–20

Acknowledgement of the Traditional Owners of the Murray–Darling Basin

The government agencies involved would like to acknowledge and pay respect to the Traditional Owners of the Murray–Darling Basin and their Nations, who have a deep cultural, social, environmental, spiritual and economic connection to their lands and waters. They understand the need for recognition of Traditional Owner knowledge and cultural values in natural resource management in the Basin. It is hoped that by continuing to work closely with Traditional Owners and First Nations People we can help in the journey to heal the land, Country and Peoples of the Basin.

Aboriginal people should be aware that this publication may contain images, names or quotations of deceased persons.

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An online version of this report and further information about the Murray–Darling Basin are available at www.mdba.gov.au.

Acknowledgements

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Cover design

The cover artwork titled "Rivers, the veins of our Country" was designed for this series of publications by Conan Fulton, a Pakana Aboriginal man from Tasmania. The design is a contemporary re-imagining of traditional Aboriginal artwork elements. usually depicting meeting places or gatherings of people. In Conan's design the dotted circles represent the many Aboriginal Nations spread across the footprint of the Murray-Darling Basin. The negative space that cuts between and creates the random shapes of the circles, represents the "Rivers and Streams" that have shaped the landscapes of and connected our Nations for thousands of years.

The RVOC Colour Theme

The colour pallette used in the RVOC artwork and document is symbolic of the ochre pigments used in traditional Aboriginal ceremony and paintings.

Ochres are primarily natural pigments and minerals found in the soil and charcoal. These natural pigments (colours) were used in body painting, rock painting, on artefacts and sometimes even on sand. Ochres had an enormous value to Aboiginal people and were traded between different Nations all across Australia.

Contents

Introduction

"The rivers are the veins of the Country, if you take too much water from them Country get's sick."

Shane Monk, Taungurung man

This report is a collection of short stories. Ten true stories which demonstrate the deep connection individuals and communities have to water. Additionally, these stories (or 'case studies') show how First Nations people are working across the Basin to achieve shared cultural and environmental benefits through the delivery of water for the environment. These stories have been developed in collaboration between First Nation groups, the states and Commonwealth agencies from across the Murray-Darling Basin.

We want to acknowledge and thank everyone who has worked on these projects and shared their stories with us: multiple First Nations from across the Murray-Darling Basin, the Murray Lower Darling River Indigenous Nations, the Northern Basin Aboriginal Nations and various government agencies. Additionally, we would like to thank the state and Commonwealth agencies which manage water for the environment and have supported the implementation of these projects.

Looking out to Coombool swamp. Chowilla floodplain, South Australia.

The importance of healthy waterways

"I grew up on the River. We've cared for the river. If we don't look after it now, what have we got to leave for future generations?"

Ngintait man Uncle Norm 'Tinawin' Wilson

First Nations people have an intricate and enduring connection to water. Cultural traditions, stories and knowledge are entwined in First Nations custodianship of water resources. First Nations people have, through tradition, lore and custom and over thousands of generations, inherent rights, interests and expertise in managing land and water sustainably. Caring for Country and water is fundamentally linked to the maintenance of good health and wellbeing of people (Figure 1). The case studies presented in this report reflect how these intricate relationships are incorporated into the management of water for the environment across the Murray-Darling Basin.

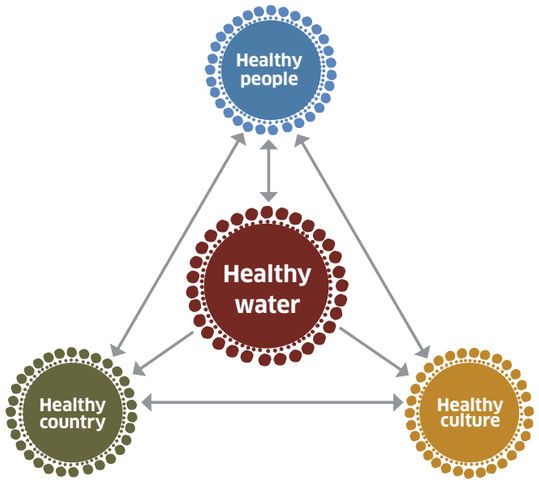


Figure 1: An Indigenous Australian view of the relationship between water, environment, culture and people.[1]

1 Adapted from Moggridge B 2010, Aboriginal Water Knowledge & Connections, in: Water and its Interdependencies in the Australian Economy, 22 to 23 June 2010, Australian Academy of Technological Sciences and Engineering, Sydney.

The case studies highlight some of the most significant cultural and environmental outcomes of the involvement of Nation groups in the planning, delivery and monitoring of water for the environment, including:

- the connection and reconnection to Country and communities;
- the continuation of cultural practices which have persisted for millennia;
- the identification, documentation and protection of important sites and their cultural uses and values;
- the use of both cultural science and western science to manage water;
- fostering mutual respect, connections and relationships between government agencies and First Nations to allow two-way learning between Nation groups and agency staff;
- learning across generations; and
- the provision of learning, training and employment opportunities.

Importantly, these outcomes are not unique or specific to each case study. Connection to Country, sharing of knowledge, mutual respect and an appreciation of the need to care for our environment are woven throughout each story. There is also the celebration of Culture, as traditions which have persisted for tens of thousands of years are given the opportunity to continue. The story from Millewa draws our attention to the impacts of river regulation on cultural heritage and the need to better work together to protect cultural sites in the landscape.

Collectively these case studies are in many instances the product of years of engagement – over a decade in some cases – where relationships between agency staff and First Nations people have been built on respect for each other and Country. Agency staff continue to strive to ensure engagement is respectful, culturally appropriate and undertaken using the

protocols for free, prior and informed consent. The story from two Ngarrindjeri Traditional Owners is a reflection on their roles with The Living Murray Program and the importance of working with First Nations to care for Country.

The stories from 2019–20 outlined in this report are set against a challenging background of bushfire and drought. Throughout 2019, drought dominated much of the landscape. Communities, our rivers, wetlands, billabongs and our rural landscape were under immense pressure. Welcome rain in early 2020 saw an easing of conditions across much of the Basin, but it will take time to recover, especially from the extreme drought conditions across the north. Careful use of water for the environment during drought and when flows restart has an important role to play in helping to protect and recover the health of Country and communities.

The stories presented here highlight what can be achieved by working well together and a shared hope for healthy and vibrant Country and Culture. Highlights include:

- At a Basin scale for the first time over 30 First Nations provided guidance on priorities to environmental water holders through the First Nations Environmental Water Guidance (FNEWG) Project.
- In the northern Basin environmental flows reconnected the Narran River to the lower Balonne floodplain, with water bringing life back to the land and bringing people together to celebrate and share stories.
- In the southern Basin respectful local partnerships between agencies and a range of Nation groups saw significant environmental and Cultural outcomes, including the reintroduction of golden and silver perch in Western Victoria, supporting Totemic black swans to breed at Chowilla floodplain, and wetland plant recovery in significant wetlands such as Guttrum Forest and Horseshoe Lagoon in Victoria.
- In a year where fire impacted many parts of the country, the importance of Cultural burning to help manage the landscape was at the forefront of many conversations. The Barmah case study explores fire as a management tool to be used alongside water to recover native vegetation.

The year also saw the spread and impacts of COVID-19 which presented challenges to communities and Government agencies alike – restricting travel and face to face engagement. New ways of meeting virtually supported ongoing and regular connection, however, face-to-face meetings are the best way to engage. Agencies and Nation groups look forward to getting back out to work together on Country for Country in 2021.

River red gum at Little Rushy Swamp, Barmah Forest (Photo: Keith Ward)

What is water for the environment?[2]

When we talk about 'water for the environment' (or 'environmental water') we are referring to water set aside to benefit plants and animals. Many rivers have been modified as the Basin population has grown, and water has been provided to towns, industry and food production. Instead of water flowing naturally through the landscape, water is now captured in dams and weirs, and then delivered via pipes and channels. These changes have interrupted many of the natural river and wetland processes needed by native plants and animals to survive, feed and breed. Water for the environment improves the health of rivers, wetlands and floodplains. Healthy rivers benefit all river users and are vital to our economy as well as underpinning community and cultural health and wellbeing.

Swan nest at Steamer Plain, Barmah Forest (Photo: Keith Ward)

Who manages water for the environment?[2]

Management of water for the environment involves a range of people and organisations, including local communities, waterway managers (Catchment Management Authorities and Local Land Services), storage managers (water corporations), land managers and scientists and environmental water holders[3].

The management 'cycle' starts with the identification of watering activities and environmental objectives in a particular region for that year. This planning process relies on the best available information from various government agencies, First Nations, scientists, stakeholder groups, community members and non-government organisations. Water for the environment is then delivered at the right time and in the right amount, to support rivers, wetlands and floodplains and the species which depend on them.

Emu nest at Top Lake, Barmah Forest (Photo: Keith Ward)

2 http://www.vewh.vic.gov.au/

3 Five environmental water holders have contributed to this document: Commonwealth (CEWH), Victoria (VEWH), NSW DPIE, SA DEW, and joint governments delivering The Living Murray initiative."

Case studies of engagement

The following case studies provided by First Nations peoples and environmental water holders demonstrate a range of activities undertaken throughout 2019–20, highlighting some of the benefits and outcomes achieved through the involvement of First Nations in the planning and delivery of water for the environment.

Importantly, many of the case studies have been drafted by First Nations people providing them the opportunity to share their stories. These stories showcase a variety of engagement approaches and the numerous resulting benefits for both people and the environment.

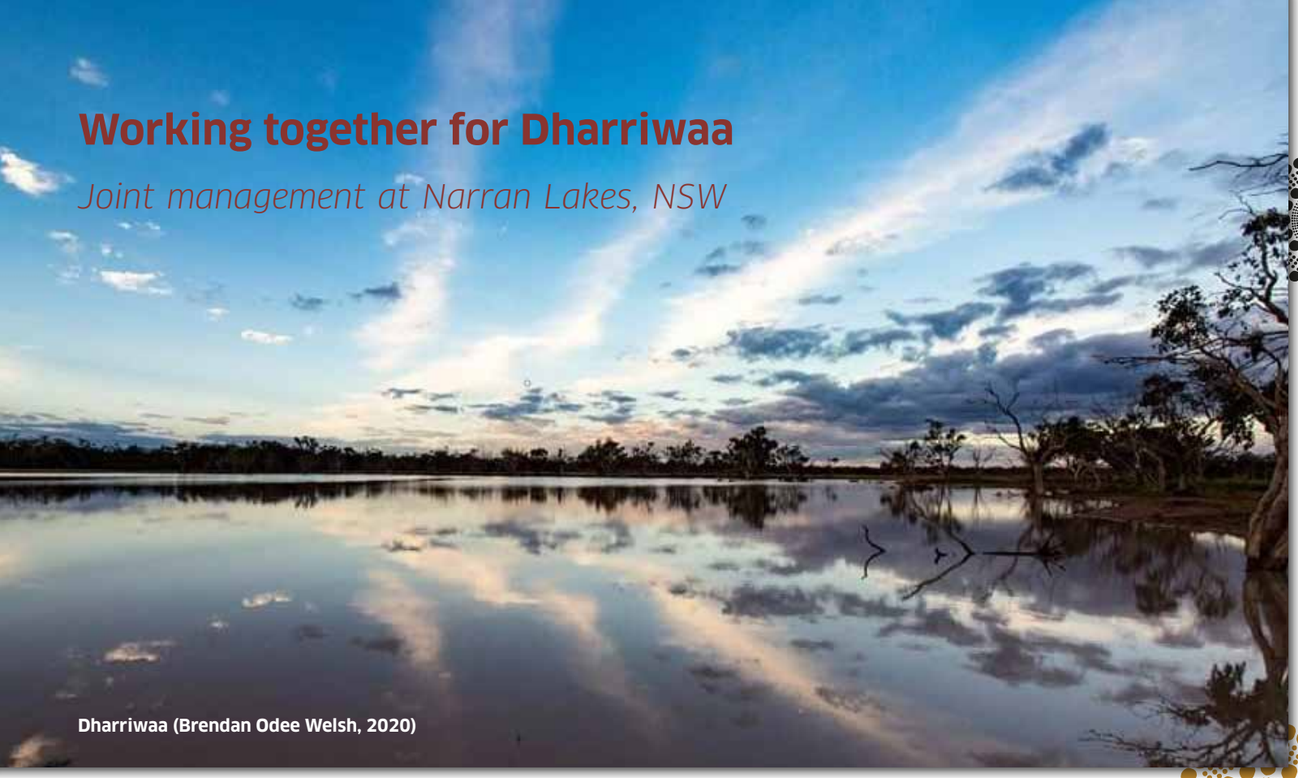
The map (opposite page) shows the locations of the 10 case studies.

2019-20 Case Study Locations

1. Working together for Dharriwaa – Joint management at Narran Lakes, NSW
2. Cultural knowledge informing water use at Chowilla Floodplain – Aboriginal Waterways Assessment at Coombool Swamp, South Australia
3. Native fish re-stocking at Wallpolla Horseshoe – Lindsay-Mulcra-Wallpolla Islands Icon site, Victoria
4. Water for the environment to the rescue at Guttrum Forest, Victoria
5. Strengthening connections with water for the environment – The First Nations Environmental Water Guidance Project
6. Managing Aboriginal Heritage in a highly regulated river system – Millewa Forest, NSW
7. Cultural values and native species are both winners at Horseshoe Lagoon – Goulburn River, Victoria
8. Learning with locals in monitoring and research – Turtle monitoring with Yarkuwa Indigenous Knowledge Centre, NSW
9. Using fire to seek cultural outcomes for traditional weaving species for the Yorta Yorta – Barmah National Park, Victoria
10. Sharing the knowledge through The Living Murray Indigenous Partnerships Program

Working together for Dharriwaa

Joint management at Narran Lakes, NSW



Dharriwaa (Brendan Odee Welsh, 2020)

For over seven years, the Narran Lakes and surrounding river system remained dry. The Lakes, known as *Dharriwaa* by the Yuwaalaraay/Euahlayi people, is a significant meeting place for Aboriginal peoples and a source of food and medicine. The origin story of Dharriwaa highlights its immense cultural significance and demonstrates the importance of the area, especially for waterbirds.

In fact, Dharriwaa is one of the most important waterbird nesting sites in Australia. During wet times, there have been more than 50,000 nests and some of the largest recorded gatherings of waterbirds, around 200,000, have been recorded there. The site is an important stop for many migratory waterbirds that visit Australia annually over spring to summer, with parts of Dharriwaa listed as internationally important wetlands.

However, due to the recent prolonged drought, important plants which the birds use to nest and live in have been dying.

In early 2020, after welcome rainfall in the region, the Commonwealth Environmental Water Office (CEWO) worked with Queensland and NSW governments and a local landholder to ensure more water flowed into the Narran Lakes.

As a result of this collaboration, around 90 GL of water filled the Narran Lakes between February and April 2020, the most water to reach the special site since 2012. Water also flowed throughout the Lower Balonne, through multiple rivers, across floodplains and all the way down to the Menindee Lakes – in what has been the largest Commonwealth watering event in the northern Basin in the ten-year history of the CEWO.

Staff from CEWO worked with NSW and Queensland government agencies, the University of New England and Traditional Owners from the Narran Lakes Joint Management Committee to monitor the wildlife and plant recovery since water reached Dharriwaa. The Murray-Darling Basin Authority also keenly monitored the event using satellites.

The fieldwork enabled knowledge exchange between researchers, water managers, and Traditional Owners. Traditional knowledge and cultural insights into the plants, animals and artefacts encountered during the surveys was generously shared amongst the monitoring team during days out on Country. Joint Management Committee member, Rhonda Ashby commented that "*cultural and scientific knowledge can be embedded through respectful relationships and partnerships. It's vitally important for Narran Co-management and researchers positively working in collaboration and understanding each other roles for better outcomes for all*".

The JMC survey team (CEWO, 2020)

Crocodile outline made at Narran Lakes (UNE 2018)

Over 30 waterbird species have been recorded since the flows, including the freckled duck, blue-billed duck and black necked stork, which are all listed as threatened species. Critically, all key waterbird nesting areas have had a drink, including 4,500 hectares of the Ramsar site, within the Narran Lake Nature Reserve.

Traditional Owner, Brendan Odee Welsh summed the event up saying "*Our Yuwaalaraay country has been galingin (thirsty) for the longest time. It's always special to be out at Dharriwaa (Narran Lakes) but even more so after these water events*".

Jody Swirepik, Commonwealth Environmental Water Holder, visited Dharriwaa to see water fill the lakes. "*It will take more flows like this before Narran Lakes is able to bounce back to pre-drought health, but these flows have been a great start to help to bring life back to Dharriwaa*".

The origin of Dharriwaa

Back in the creation time, Byamee went hunting with his two wives. His wives went one way, and he the other.

Byamee was supposed to meet his wives back at Coorigel spring. However, whilst bathing in the sweet and clear water Byamee's wives were seized and swallowed by two *kurreahs* (crocodile like creatures). The *kurreahs* then dived into an underground watercourse, which led to the Narran River – drying all watercourses along the way.

When Byamee reached the spring and realised what had happened he started in pursuit of the *kurreahs*. The track Byamee followed is still marked by the morilla ridges, which stretch down the Narran, pointing in towards the deep holes.

Finally, Byamee came to the end of the Narran and the *kurreahs* who had eaten his wives. Byamee speared and killed the *kurreahs* to release his wives who promptly came back to life.

Byamee then said: "where there was dry land and stones in the past, in the future there will be water and water-fowl, from henceforth; when the Narran runs it will run into this hole, and by the spreading of its waters will a big lake be made." (Parker, K 1897, sacred-texts.com).

Some of the monitoring team (CEWO)

Cultural knowledge informing water use at Chowilla Floodplain

Aboriginal Waterways Assessment at Coombool Swamp, South Australia

By Fiona Giles – First Peoples Coordinator

We acknowledge the First Peoples of the River Murray and Mallee Region as the custodians of the greater River Murray and Mallee region and that their cultural and heritage beliefs are still as important to Traditional Owners, the living Ngaiawang, Ngawait, Nganguruku, Erawirung, Ngintait, Ngaralte, and Ngarkat people today.

Swan nest on Coombool Swamp (Photo: Helga Kieskamp)

Feather flowers (black centres are swan feathers) (Photo: Fiona Giles)

Tjowila (Chowilla) is the Traditional homelands of the First Peoples of the River Murray and Mallee (FPRMM) and is one of the six Living Murray icon sites in the southern Murray-Darling Basin. In 2019–20 water for the environment was delivered to several sites on the Chowilla Floodplain including Coombool Swamp. This large temporary lake sits high in the landscape and requires a natural flow of 70,000 ML/day to South Australia to begin to fill with water. Prior to river regulation, Coombool Swamp received natural flooding every 2–3 years and so was a near permanent source of water. It now receives these natural flows much less frequently and during dry years, water for the environment is pumped into the swamp to maintain the health of the long lived vegetation and to provide important refuge habitat for wildlife.

Between September 2019 and January 2020 Coombool Swamp received 5 gigalitres (GL) of water for the environment from The Living Murray (TLM) program.

> *Traditional Owner, Delilah Lindsay noted that "Coombool Swamp needs more water, it's a little bit unhealthy as the black box trees need more water in the area around the swamp".*

Aboriginal Waterways Assessment

Aboriginal Waterways Assessments (AWA) are used by Traditional Owners to assess the cultural values of wetlands and other important sites to support water for the environment and wetland management. The tool has been modified to better suit the needs of the FPRMM. Aboriginal Waterways Assessments are being undertaken across a range of wetland and floodplain sites, to enable cultural objectives to be identified and used to inform water use.

On Monday 16th March 2020, a small team from the First Peoples Working Group (FPWG) visited Coombool Swamp to assess the site. The AWA team spotted a large numbers of water birds using the lake including a large number of swans and swan nests on Coombool Swamp. A Traditional Owner waded out to one of the nests and counted 7 fresh eggs, an exciting find! FPRMM have always observed where the swans are most active to locate their nesting areas. In recent years, First Peoples have noticed that swan nests and eggs are harder to find these days, perhaps indicating declining numbers.

Black swan sunset (Photo: Helga Kieskamp)

Undertaking the waterway assessment (Photo: Ali Stokes)

Swan eggs (Photo: Helga Kieskamp)

The Cultural Value and Importance of Swans and their Eggs

Fiona Giles, First Peoples Coordinator and a Traditional Owner explained that "*While swans are not a threatened species, they are culturally significant and are a totemic animal (Ngatji) to Traditional Owner groups. Our Elders have taught us how we are spiritually connected to our Ngatji and that we have traditional lores and practices that have to be respected when hunting, killing and eating Ngatji.*"

When flooding naturally occurs, swan eggs (*Kungardi Ngartharies*) are collected from nests in the reeds of the back waters and swamps. Swans build their nests by twining reeds together so the nest can handle weight and to allow up and down movement on the changing water levels.

One swan egg is roughly equivalent of 4 chicken eggs. When swan eggs are collected in the spring months, one egg is taken from the nest to the water to test for freshness, if the egg sinks, it's fresh. If the egg floats, it has air inside and is placed back in the nest as it has a formed chick inside. If there are 5 eggs in a nest, 2–3 eggs can be taken. Eggs with young inside were rarely taken, but they were also a delicacy. After touching the eggs and going near the nest, water would then be splashed over the entire nest area to rid the site of any human scent so the swans can return and incubate the remaining eggs.

In times of hardship, the swan was also hunted and eaten as they are curious and easily lured to the water's edge to humanely kill, a swan without a partner is always the target. Swan meat is rich and has to be eaten in moderation or you will get an upset stomach. The swan's intestines (*Kungardi Wulcheries*) are thoroughly cleaned by running water through them, they are then dried, dusted in flour, fried and called "river sausages". The gizzard (giblet) is cut open to remove all of the grit before cooking. All the leftover bones from the swan are then cooked into a soup.

The wing of a swan would be kept and used as a broom for sweeping. The feathers are also used for covering tracks, making feather flowers and ceremonial practices.

As cute as it gets, cygnets on the nest (Photo: Ali Stokes)

Swan nest with eggs (Photo: Fiona Giles)

Working together to have additional environmental water delivered

Recognising that water levels could drop and expose the nests to predators, the AWA team worked with Chowilla TLM staff to request additional water for the environment for Coombool Swamp. A further 2 gigalitres of water was pumped into Coombool Swamp to maintain water levels within the lake, enabling the swans to complete their breeding cycle, while also providing amazing benefits for a range of other water birds including migratory species.

Cygnets have been observed in the nests and with their parents on the swamp. A motion activated camera was set up on Coombool Swamp to record the progress of the swans and cygnets. When the footage was shown at the FPWG meeting, Traditional Owner Philip Johnson commented "*A paradise has been created for the swans*".

Undertaking the AWA during the watering has enabled the sharing of valuable cultural and ecological knowledge to improve the management of the site. The First Peoples and Chowilla TLM staff are committed to continuing to work together to undertake more AWA's at watering sites across the floodplain and to make improvements to the AWA program. In undertaking the AWA it was highlighted how important it is for First Peoples to have access to sites at Chowilla for cultural activities, how important water is to this dry and isolated landscape and the importance of exploring further learning, training and employment opportunities for FPRMM at Chowilla.

> *"A paradise has been created for the swans"*
> *Traditional Owner, Philip Johnson Snr.*

Acknowledgements

Thanks to The Living Murray Indigenous Partnerships Program & Chowilla Icon Site Management Staff for their ongoing engagement of FPRMM on Chowilla Floodplain Projects.

The National Parks and Wildlife team who worked on a targeted approach to fox baiting around Coombool Swamp.

The MDBA, SA Water, and the DEW ecologists for recording and monitoring all flora and fauna species on the Chowilla Floodplain.

Native fish re-stocking at Wallpolla Horseshoe

Lindsay-Mulcra-Wallpolla Islands Icon site, Victoria

The Lindsay-Mulcra-Wallpolla (LMW) area holds significant cultural value for Traditional Owners and provides an important opportunity to share knowledge within the Aboriginal community. The region has a rich cultural background and the rivers and floodplains in this region were once highly productive, providing abundant resources for populations living here.

The site is also an important habitat for several large bodied native fish, including golden perch, silver perch, Murray cod and freshwater catfish, which are of significant importance and a key food resource species for Traditional Owners. The LMW wetlands provide an important nursery habitat in the life cycle of native fish species. They are highly productive, offering ample food and shelter to young fish which allows rapid growth. Unfortunately, a number of species have seen declines with river regulation and habitat change.

Water for the environment is being used to restore habitat and reinstate more natural watering cycles to the floodplains and associated wetlands, and while the focus on the delivery of water has been primarily on environmental outcomes, there has been strong involvement of Traditional Owners and learning from their knowledge to achieve objectives relating directly to traditional knowledge and culture. A key component of this work has been increasing the populations of fish species supported by native fish stocking initiatives.

In 2018 Traditional Owners in conjunction with the Mallee Catchment Management Authority (CMA) released native fish into Wallpolla Horseshoe Lagoon on Wallpolla Island, part of the LMW Icon Site. The wetland was initially allowed to dry (to remove competitors and predatory fish) and during spring 2018, was filled by pumping water for the environment from the Murray River. Following the filling of the wetland, Mallee CMA worked extensively in partnership with Traditional Owners to undertake fish surveys to ensure low numbers of pest or predatory species were maintained prior to the release of the 120,000 golden perch and silver perch fry.

Getting fish ready to enjoy the warm and rich wetlands of the floodplain (Photo: Mallee CMA)

Nyeri Nyeri Traditional Owner Mark Grist, who helped release the fish, said "*It's fantastic! You've got 120,000 young fish, golden perch and silver perch being released into a living landscape – that is really refreshing!*"

The partnership with Traditional Owners continued into 2019 through the monitoring of water levels in Horseshoe lagoon to ensure the ongoing survival of the released fish. This monitoring by Traditional Owners also provided important opportunities to share knowledge and stories with the wider Aboriginal community, including for Elders to pass on information to youth.

The partnership has identified the need to continue providing water when levels fall to a critical level to ensure the survival of the released fish. A key learning from the project for Mallee CMA is the importance of having Traditional Owner input in the delivery of water for the environment, with the aim to allow greater flexibility in delivery timeframes.

This flexibility allows for improved cultural and environmental outcomes while also delivering on the Victorian commitments for the Basin Plan.

> *"I see a project like this setting the benchmark for how we could replicate natural ephemeral wetlands as they would have been used before river regulation. These wetlands provide a refuge, not only for fish but for us as well, they serve a great purpose in our whole landscape of North West Victoria."*
>
> Mike Gilby – Vic Fisheries and Aboriginal Community member

> *"These wetlands have created the perfect environment for native fish to be restocked. Research has shown projects like this work."*
>
> Braeden Lampard – OzFish

Traditional Owner, Ngintait man Uncle Norm 'Tinawin' Wilson was among the group to assess the area.

Uncle Norm, who grew up along the Murray River in Berri, South Australia, said he found it interesting to learn more about the different waterbodies around the sites and at Ned's Corner. "*I grew up on the river. We've cared for the river. I know the whole river backwards.*" He said. "*If we don't look after it now, what have we got to leave for future generations?*"

Working together to care for Country; fish stocking at Wallpolla Horseshoe (Photo: Mallee CMA)

Phillip 'Willow' Johnson, from the Ngintait language group offered his views on the importance of water for more than just fish. "*Wind is the main enemy we've got at the moment." I'd like to see watering happen. It would rejuvenate all the black box around the resting places and it'll help the other bushes grow – saltbushes and lignums – and that should help protect the area more from the wind. The plant life will come back and it will protect the resting place from the wind itself – that's what we want – to protect our old ancestors.*"

Ongoing talks with Traditional Owners have identified other sites across Lindsay-Mulcra-Wallpolla to continue to build knowledge and implement similar cultural sharing opportunities which benefit the environment and people.

> *"The release was a true community project. These wetlands provide a refuge, not only for fish, but for us as well. Any project that enables the overall community to come together for me is magical … I can't get enough of them,"*
>
> Mark Grist – Nyeri Nyeri Traditional Owner

Healthy waterways will benefit future generations (Photo: Mallee CMA)

Reedbed Swamp Guttrum Forest, (Photo: NCCMA)

Water for the environment to the rescue at Guttrum Forest, Victoria

In Guttrum State Forest an urgent rescue mission commenced in December 2019 to save a culturally rich and ecologically significant wetland complex. The Victorian Environmental Water Holder (VEWH), North Central Catchment Management Authority (CMA) and Barapa Barapa and Wamba Wemba Traditional Owners worked together to deliver much needed water to the site and monitored the outcomes.

Reed Bed Swamp and Little Reed Bed Swamp are nestled low in Guttrum State Forest, on the Murray River near Koondrook. Environmental water managers and Traditional Owners have been increasingly worried that the wetland plants and large old red gum trees surrounding the wetlands were being stretched beyond their tolerances under persistently dry conditions.

"*Prior to river regulation and European occupation, Reed Bed Swamp and Little Reed Bed next door would have naturally received some water on average nine out of every 10 years, usually over winter or spring,*" North Central CMA Program Delivery Executive Manager Rachel Murphy said.

"*The wetlands are fairly shallow and would often have dried out after about six to nine months, which provided the perfect conditions for wetland plants and animals to thrive.*"

Upstream river regulation has reduced the frequency, duration and magnitude of flooding in the forest.

"*Modelling shows that even during the driest periods, including the devastating Millennium Drought, the mid-Murray floodplains would have historically received some water without river regulation. Given these swamps' low-lying position on the floodplain, they would have received water most years even despite the dry conditions.*" Rachel said.

Temporary pumps were used to deliver a small allocation of water for the environment from the River Murray to the Guttrum Forest wetlands.

This recent allocation of water for the environment consisted entirely of return flows, water that has already come down the Campaspe and Goulburn rivers as part of the Victorian water for the environment program. Across Victoria a large proportion of water for the environment (82% in 2019-20) is reused at multiple sites as it travels downstream, supporting improved environmental outcomes again and again.

Environmental and cultural values

As recently as the 1990s, the swamps in Guttrum Forest were home to an abundance of important native plants such as old man weed, and the giant rushes the swamps are named after. The reeds and surrounding trees provided important habitat for birds such as the endangered Australasian bittern and colonial nesting waterbird species.

There are also a number of culturally significant old river red gums on the fringes of the wetlands, and the swamps are surrounded by archaeological evidence including large mounds and middens, indicating the area was once a highly productive landscape for local Aboriginal communities.

Local Barapa Barapa and Wamba Wemba Traditional Owners remember the wetlands being very different when they were kids. They remember them being a lot wetter and often there was a green carpet of native mudflat plants covering the wetlands' beds.

Wading through Guttrum (Photo: NCCMA)

"*The watering of Guttrum Forest has been a long-term goal of the Traditional Owners of the area for many years,*" the Barapa Barapa Wamba Wemba Water for Country steering committee said.

"*Guttrum Forest is an ideal place for bird watching, an important breeding site for native wildlife, including water birds, with trails that wind through majestic river red gum and canoe trails to explore the winding waterways.*"

"*The wetlands are of regional significance and have enormous cultural importance to the Wamba Wemba and Barapa Barapa People.*"

"*The watering of the Reed Bed Swamp in Guttrum Forest is good thing for the future of the forest and the region, with a regular water regime the long-term health of the landscape is ensured.*"

The North Central CMA, the VEWH and local Traditional Owners are working on a rehabilitation plan for the swamp complex.

"*Traditional Owners work with the CMA to monitor the watering and look at the response of the wetland from an ecological perspective, as well as monitor the cultural values of the area, and the VEWH is pleased to be able to help make this happen,*" VEWH Commissioner Rueben Berg said.

"*The Barapa and Wamba communities have been engaged for several years now to talk about reinstating the natural flooding regime and have waited a long time to see the return of water to Reed Bed and Little Reed Bed swamps,*" Rueben said.

Taking a moment to enjoy the wetland (Photo: NCCMA)

Strengthening connections with water for the environment

The First Nations Environmental Water Guidance Project

Over 2019–20, the Northern Basin Aboriginal Nations (NBAN) and the Murray Lower Darling Rivers Indigenous Nations (MLDRIN) partnered with the Murray Darling Basin Authority (MDBA) and the Commonwealth Environmental Water Office (CEWO) to share information, collaborate and integrate information about watering priorities directly into Basin annual environmental watering priorities. This work was undertaken through the First Nations Environmental Water Guidance (FNEWG) project.

The FNEWG project funded NBAN and MLDRIN to collate information about where and how water for the environment should be delivered to support tangible outcomes and benefits for First Nations. These tangible benefits include:

- improved fish populations to support fishing and healthy diets
- improved health and abundance of reeds and other culturally significant plants used for purposes such as weaving, tool making and medicine
- flows timed to coincide with important animal breeding or cultural activities
- improved health, wellbeing and cultural resilience for First Nations people.

In the FNEWG project, 32 Nations from the northern and southern Basin identified important waterways and significant species, as well as the timing of flows needed across the Basin to support them. Connecting rivers and their floodplains was identified as vital, along with ensuring enough good quality water flows through each Nations' Country, to those downstream.

As a result of the work undertaken through the FNEWG project, First Nations people's values and water management objectives have been represented at a Basin-scale and included in federal government planning for water for the environment for the first time.

"*The 2020–21 watering year will, for the first time in history, see First Nations' environmental watering objectives acknowledged and incorporated into environmental water management at a federal level. This is a significant step forward,*" said Fred Hooper, Chair of NBAN.

Involving First Nations at the northern Basin scale

NBAN worked with 16 First Nations to collect more than 10,000 environmental watering objectives at 111 sites across the northern Basin. The First Nations environmental outcomes gathered through this process highlight the wealth of knowledge First Nations people hold in relation to the northern Basin and across common themes, indicator species and significant sites.

NBAN worked with northern Basin First Nations to identify cultural indicator species. These are species that are endemic to river stretches and if they were seen to be flourishing would provide an indication to First Nations people that the rivers were healthy. When these indicator species thrive, First Nations people know that Country is healthy, and they experience improved spiritual, cultural, environmental and social conditions as a result. Critically, some of the flow indicator species listed by First Nations have not been seen in these river reaches for years.

The Basin-wide environmental watering strategy focuses on achieving improvements for flows, native vegetation, waterbirds and native fish, as indicators of a healthy river system. Nations stressed the importance of considering outcomes beyond fish, waterbirds and vegetation, wanting to see outcomes for important terrestrial and totemic species.

Members of the Northern Basin Aboriginal Nations, CEWO and MDBA staff at a meeting to discuss the First Nations Environmental Water Guidance project (NBAN, 2020)

Improved flows to connect along rivers and the quality of flows were a clear theme from all Nations involved. Nations identified key sites of cultural importance, including Narran Lakes and the Macquarie Marshes which they would like to see supported using water for the environment. They highlighted the importance of ensuring rivers are connected to nearby wetlands and anabranches to provide opportunities for First Nations people to connect with Country. They said special attention should be given to providing opportunities to Nations to fulfil their cultural obligation to ensure that neighbouring Nations downstream have enough water.

"*First Nations value and use these species today, in the same way we have for thousands of years. Water in the rivers means water for these species,*" (NBAN, 2020).

"*This is the first time we have been invited to sit [as neighbouring Nations] and talk about connectivity. Up until now, our Nations have just been [individual] dots on a map,*" said NBAN Deputy Chairperson and Guwamu woman, Cheryl Buchanan.

Involving First Nations at the southern Basin scale

MLDRIN worked with 16 Nations from across the southern Murray–Darling Basin to collect information about their priorities for environmental water management in 2020–21. Nation delegates, Elders, community members and water advisory committees responded to a questionnaire produced by MLDRIN, with detailed views about where and how water should be provided to protect and enhance important places, significant species and other cultural values.

Information gathered through this process was then analysed to identify shared priorities and areas of common concern. It is critical to note that, for First Nations in the southern Basin, all waterways, communities and plant and animal species exist as an interconnected whole. While it is impossible to assign greater importance to one waterway or species, it is possible to identify common concerns and shared objectives.

Key culturally significant species identified by multiple Nations included: Murray cod, golden perch (yellowbelly), catfish, black swans, pelicans,

duck species, old man weed and other medicinal plants, river red gums, black box, cumbungi and lignum. Critically, Nations stressed the importance of considering outcomes beyond fish, waterbirds and vegetation. Nations also wanted to see improved outcomes for aquatic fauna such as turtles, yabbies, mussels, frogs, platypus and rakali (water rat) as well as terrestrial fauna such as kangaroos and emus.

"*The Nations' input highlights shared concern for all major rivers across the Basin and how environmental water can be used so that life returns to our culturally significant places,*" said Rene Woods, Chair of MLDRIN.

Participating Nations also identified key waterways and areas of Country that were in need of watering. Multiple Nations submitted priorities relating to the Murrumbidgee, Baaka (Darling River), Lachlan, Campaspe, Murray and Edwards-Wakool systems, but notably, participants said they shared common concern for all major rivers across the region. This is because declining river health and low flows in one part of the Basin can affect communities and cultural outcomes across the system.

Improving the timing, volume and quality of environmental flows in all major rivers, informed by First Nation's science and traditional knowledge, was identified by multiple Nations as a key to sustaining stories, values and connection to Country. Nations wanted to see water for the environment used to connect wetlands, billabongs and floodplains, so that life returns to these culturally significant places.

Feedback provided by First Nations also highlighted the shared opportunities and barriers for greater involvement in the management of water for the environment across the southern Basin.

"*It is essential that water holders continue, and strengthen, direct engagement with First Nations to empower our participation in environmental water planning and delivery,*" (MLDRIN, 2020).

Building on FNEWG

This project provided an important opportunity to strengthen involvement of First Nations to empower their participation in water for the environment planning and delivery.

It is crucial that water holders and agencies continue to create these opportunities to centre First Nations people, science and traditional knowledge in the management of water for the environment. The common goal of improving and sustaining the health of our waterways can be better achieved through collaboration and co-management.

Tati Tati Traditional Owners at Margooya Lagoon discussing objectives for water management (MLDRIN, 2020)

Managing Aboriginal Heritage in a highly regulated river system

Millewa Forest, NSW

The rivers of the Murray–Darling Basin are highly regulated. The way water moves through the landscape has changed. The way land is managed has changed and these changes can impact different parts of the landscape including sites of cultural significance. The following case study shows how these impacts can occur and how working with Aboriginal people is critical to identifying, protecting and caring for the river system and sites of significance. It also highlights the role of science and technology, and the need for ongoing monitoring to help care for these important places. As we all work together in a highly modified system, it is important this story is shared to improve our awareness of the impacts of river regulation and how Traditional knowledge and customs can work hand-in-hand with water managers to help protect these areas.

Readers should be aware that the following text discusses sites of cultural significance, including burial sites and ancestral remains, and that some readers may find the following content upsetting.

Before European settlement, many First Nations called the Murray River and surrounding landscape home. It was where they lived, thrived, hunted, fished, cooked, played, cared for, held ceremony and laid those who had passed to rest. The evidence of this is all throughout the landscape. Thousands of years ago, a fault-line in the landscape redirected the Murray south towards Echuca, and the Edward River north to Deniliquin as the river made its way around the fault line. Today, these rivers are highly managed within a landscape with thousands of years of culture and heritage.

In 2010, a number of state forests along the Murray including Millewa, Moira and Gulpa Island, which include large stretches of the Edward River, were transferred to the NSW National Parks and Wildlife Service to be managed for conservation, recreation – through the appreciation and enjoyment of nature – and the protection of cultural heritage.

In 2011, recreational boaters observed what appeared to be human remains protruding from the bank of the Edward River in the Millewa Forest (Murray Valley National Park). The site was inspected in 2012 by an archaeologist and Aboriginal community members and was confirmed and recorded as Aboriginal ancestral remains, located within a mound site primarily used for cooking river and wetland resources. Mounds such as these are known to be used as burial grounds along the Murray and Edward River systems.

Unfortunately, the site had been heavily impacted over many years and it was likely that part of the ancestral remains had fallen into the river. It was determined that ongoing erosion would continue to impact the site. Therefore, a decision was made to excavate and rebury the Aboriginal ancestral remains to the back of the mound site with assistance from Traditional Owners.

Work site on edge of Edward River (NPWS 2017)

Use of Ground Penetrating Radar (GPR) (NPWS 2018)

The Edward like most rivers in the Murray-Darling Basin is now highly regulated. In this modified system, when the Murray reaches a particular height, the regulator at the junction of the Murray and Edward rivers must be opened to allow water to flow down the Edward. Although this helps avoid significant local flooding, it forces the river and its creeks to run faster, posing a risk to the river's banks and any sites of cultural significance close by.

In 2017, further Aboriginal ancestral remains were discovered to be eroding from the same mound site due to ongoing erosion and undercutting of the riverbank. Consultation was undertaken with relevant Aboriginal Traditional Owners and local Aboriginal community members and a decision was again made to excavate and rebury the Aboriginal ancestral remains back into the existing mound away from the river edge. When the primary ancestral remains were unearthed, evidence of three additional sets of remains were found underneath and beside the primary remains. Approval was not valid to remove the additional remains at that time, so the site was covered, and a more intensive excavation process was required. In an effort to better understand the mound and it's potential cultural contents, ground penetrating radar (GPR) was used to provide an indication of further remains in a non-intrusive way. The GPR detected other potential burial sites and informed further planning and engagement activities with Aboriginal community members.

Due to constant and ongoing erosion, in 2019, an Aboriginal Heritage Impact Permit (AHIP) under the *NSW National Parks and Wildlife Act 1974* was issued to allow for a major excavation and repatriation of previously repatriated and any other unknown Aboriginal ancestral remains from the mound site. The project was undertaken by several archaeologists, Traditional Owners and other Aboriginal community members. A total of 9 sets of ancestral remains were excavated and removed from the mound site and repatriated to a known Aboriginal burial ground within the Murray Valley National Park in full consultation, respect and approval of Aboriginal Traditional Owners. With permission of all involved, dating of soil sediments at different levels in the site provided dates of 3,000 years before present at the base of the mound and 2,440 years at the level of the deepest ancestral remains.

The burial ground where the remains were repatriated is protected and away from any further impacts, reflecting the wishes of all involved that to the greatest extent possible, they are never disturbed again. Overall, the amount of mound eroded from river regulation is estimated to be in excess of 6 metres and most probably would have impacted other Aboriginal ancestral remains during that time. The remaining mound site has been rehabilitated with redgum retainer boards, pinned geofabric and sand. A key focus for land managers and Aboriginal community members remains the ongoing monitoring of sites to assess impacts.

The NSW National Parks & Wildlife Service will be undertaking further research and investigation to identify similar locations that may be subject to impact from river regulation. This will involve elevational mapping of the Millewa Forest landscape through LiDAR and high-resolution photography, which allows the elevated parts of the landscape which are likely to be mounds to be identified. Potential areas will be followed up through ground truthing to determine if Aboriginal heritage is subject to direct threat from river regulation. The Millewa is one site in the system and we all need to ask ourselves, what else is happening in other sites along the river systems and what can we do to better protect these sites?

This case study is an example of land managers and riparian managers working with Traditional Owners to help preserve culture. The work, funded by the Indigenous Partnerships Program, shows how a landscape rich in thousands of years of culture and connection is interacting and being impacted by a relatively new threat. It highlights the importance of the need for water and land managers to work with Traditional Owners and Aboriginal community groups to identify, protect and care for these important places. Through the use of Traditional knowledge and the latest technology (ground penetrating radar, LiDAR and carbon dating), lessons learned from this case study can help other parts of the system to learn and protect sites along the river. The ongoing monitoring of these sites remains a key focus as agencies and community groups work together to protect these sites from further impacts and help to educate everyone of the importance of trying to protect these significant sites from further harm.

Rehabilitated Mound Site (NPWS 2019)

Edward River Burial Mound Excavation & Repatriation Project Team (NPWS 2019)

Cultural values and native species are both winners at Horseshoe Lagoon

Goulburn River, Victoria

Taungurung women dance at Horseshoe Lagoon. (Photo: VEWH)

Taungurung women danced to welcome the first delivery of water for the environment to the sacred Horseshoe Lagoon, outside Seymour.

In September 2019, Taungurung Traditional Owners and local landowners welcomed representatives of Goulburn Broken CMA, Parks Victoria, and the Victorian Environmental Water Holder (VEWH) to a celebration to mark the historic occasion.

The event was the culmination of work by the Taungurung water knowledge group Baan Ganalina (Guardians of Water), who have been working closely with Goulburn Broken CMA and other partners to bring water back to the lagoon and are delighted to see first-hand the birds and other animals that have already started to return to the site.

Taungurung Elder, Aunty Patsy Smith says the watering of the lagoon is especially significant because of the site's cultural significance.

"*This is a women's place, and for me to bring my grandchildren to sing and create ceremony, it's like revival for our ancestors. It just feels as though it's brimming with life now,*" she said.

Taungurung Traditional Owners are not the only members of the community who are happy to see the changes that have taken place.

Local landholders such as Greg Smith have been campaigning for several years to have a small amount of water for the environment delivered to the site, which under natural conditions would have been inundated six years out of 10.

"*It hasn't been full since 2012. Thistles and other vegetation have grown up all around the edge of the lagoon because there hasn't been a watering here, so if we had waited much longer it would have been too late,*" Greg said.

Simon Casanelia from Goulburn Broken CMA agrees that it was a really important time to add water to the wetland.

"*We were seeing weeds start to dominate the area, and if a billabong like this is dry for too many years, the seeds of native species start to die – so they won't come back even if you get water in the lagoon,*" he said.

"*Horseshoe Lagoon is a significant habitat for rare and threatened species such as the pied cormorant, azure kingfisher and eastern great egret, along with a wide variety of other plants and animals that depend on the water for survival, so we were really excited when we heard that Horseshoe Lagoon is also really important to the Taungurung and to local landholders.*"

Simon is excited by the immediate impact that the water is having.

"*The results so far are even better than we expected – already today we've spotted ducks, ibis and kingfishers, and we're expecting to see many more species over the next few months. It's not just wetland species who benefit. We've also encountered kangaroos, wallabies and an echidna which have been attracted by the new water in the lagoon. Adding water to a billabong – especially in dry times like we're experiencing at the moment – is really important because it becomes a refuge for animals throughout the entire region. The new plant growth and the insects that emerge from the water become a food source for all sorts of woodland species. It's like a honeypot,*" he said.

The benefits of these partnerships were summed up by VEWH Commissioner Rueben Berg. At the event, Rueben spoke about the cultural significance and environmental benefits of the delivery of water for the environment to the site.

"*Horseshoe Lagoon is a great example of where we can attain shared benefits from water for the environment. This is a fantastic spot where there are really important environmental elements we want to be taking care of with our water, and there's also powerful cultural connections to this place,*" he said.

"*It's also a fantastic demonstration of what can be achieved when Traditional Owners, government agencies and local landowners work together to protect something they all agree is important.*"

Learning with locals in monitoring and research

Turtle monitoring with Yarkuwa Indigenous Knowledge Centre, NSW

The Commonwealth Environmental Water Office's (CEWO) on-ground science program, called Flow-MER, brings together scientists from some of Australia's leading universities and research institutions. These scientists monitor, evaluate and study how plants and animals respond to water for the environment.

Thanks to the data collected, CEWO have an understanding of the plants, animals and processes of the Murray–Darling Basin. Through science, CEWO has learned what it takes to get trees to flourish, where turtles go in dry times, and the importance of rivers as highways for fish movement.

The CEWO is providing funding to scientists to work with Traditional Owners so that Aboriginal knowledge can help inform how water for the environment can benefit rivers and wetlands. The aim is to build meaningful relationships based on two-way knowledge sharing between researchers, government and local communities.

Researchers and First Nations groups are working together across the Murray-Darling Basin, from story-telling and knowledge sharing of Yellowbelly in the northern basin, biological survey work in the Lachlan River system, native fish larvae monitoring in the Goulburn River to turtle research in the Edward/Kolety-Wakool river system. All of these interactions are unique and are enriching the knowledge base for healthy rivers and healthy communities.

Turtle Monitoring Program – Partnership with the Yarkuwa Indigenous Knowledge Centre

The Yarkuwa Indigenous Knowledge Centre is a Traditional Owner organisation in Deniliquin NSW, which aims to preserve traditional knowledge for future generations.

Through Flow-MER, members from the Yarkuwa Indigenous Knowledge Centre worked with researchers from Charles Sturt University to examine how flows of water for the environment impact turtle movement and condition.

Over the summer of 2019-20, the research team undertook to trap, handle and monitor turtle populations in six wetlands along the Edward/Kolety-Wakool river system.

Liticia Ross, from the Yarkuwa Indigenous Knowledge Centre noted she got involved in the project as she wanted to be out on Country and was interested to see what goes into turtle monitoring.

As a result of the project, local community members learnt new skills "*I learnt how to measure and record turtles, that they can travel a fair distance and move fast*" said Tracy Hamilton, from Yarkuwa Indigenous Knowledge Centre.

Due to the involvement of local people in the project, new skills and knowledge will be passed onto future generations. "*One thing I will take away from this experience that I didn't know before is to identify the different kinds of turtles, but what I have learnt will be passed onto the next generation*" Liticia said.

In total, 143 broad-shelled turtles, 139 eastern long-necked turtles, and 209 Murray River turtles were caught, with trapping continuing in November 2020.

Of the project, Liticia Ross stated "*I feel that we all have different knowledge of country that we were able to share and learn with each other which I feel was a great contribution to the project*".

Tracey also noted she enjoyed going out on Country and learning.

The local knowledge and experience of the Yarkuwa fieldworkers has driven the project's success, while providing an opportunity to learn new skills and share knowledge now and into the future.

In total, 143 broad-shelled turtles, 139 eastern long-necked turtles, and 209 Murray River turtles were caught, with trapping continuing in November 2020.

Turtle research team from left: Liticia Ross, James Van Dyke, Tracy Hamilton and Joseph Briggs (Photo: Liticia Ross)

Using fire to seek cultural outcomes for traditional weaving species for the Yorta Yorta

Barmah National Park, Victoria

Access to plant species such as the weaving sedge (*Carex tereticaulis*) for the Yorta Yorta People within Barmah National Park, has been somewhat difficult in recent decades due to various aspects of change. The weaving sedge is an ephemeral aquatic species which relies on regular seasonal watering, and exists throughout the area Yorta Yorta refer to as *Pama*. A changing climate and changing water regimes are having an impact on the resilience of this weaving species and therefore, the availability of this important plant for traditional knowledge and cultural use.

This important plant species relies on factors to maintain conditions that are favourable for healthy growth, such as inundation, soil health, climate, and rainfall. While improved water management is seen as critical to supporting the *Carex*, fire is a new addition to assist with the recovery of this species and to date, there has been no observation of the weaving sedge's response to fire. The purpose of undertaking the burn as part of this project was to gain a better understanding of the response of the weaving sedge to fire and importantly, for Yorta Yorta to gain further fire knowledge. First Nations People and water managers are exploring how both fire and water are used to look after country. To assist in recovering plants of environmental and cultural importance, we need to better understand the role of fire in diverse landscapes.

This project was a Yorta Yorta traditional ecological, climate and fire adaptation project to follow-on from the Yorta Yorta Elders weaving project in 2018–19 , published as a case study in *Rivers, the veins of our Country*.

The impacts highlighted above mean that the Yorta Yorta cannot harvest at this site and use the species in the same traditional setting, given that this species is only available for a short period of time. Yorta Yorta Country and the weaving sedge are forced to adapt to change, and the Yorta Yorta People are forced to adapt. Using fire practices will give knowledge on how the species responds to fire, and whether it is stronger because of fire when compared to unburnt weaving sedge.

With support from Yorta Yorta Nation Aboriginal Corporation, The Living Murray (TLM) Indigenous Partnerships Program and Victorian Department of Environment, Land, Water and Planning (DELWP), a controlled burn was undertaken at Barmah National Park on 18 May 2020 by Forest Fire Management Victoria. Yorta Yorta Nation engaged DELWP to utilize this burn to seek a cultural outcome – Yorta Yorta were keen to observe the response of the weaving sedge to fire. Sonia Cooper, the Yorta Yorta TLM Facilitator joined the Forest Fire Management Team on the day to observe the burn:

> *"To see Country burn – I felt a sense of calm; to see and feel fire – my skin felt good; to see and smell smoke – I felt I could breathe; to stand on Country – I felt strong. Country felt good that day, I felt good that day".*
>
> Sonia Cooper, 2020

It should also be noted that a cultural burn is the burning practice applied to Country to keep it healthy by First Nations people and notably should involve no digging up of the earth.

Upon inspection of the site post burn on 26 August, 9 & 11 September, and 2 November 2020 field updates and images of the site were captured by Sonia Cooper, Yorta Yorta TLM Officer. By this time, much welcome rain had been received and some parts of the forest were inaccessible. Where we could access the site, new growth of *Carex* tussocks (3, 4, & 5) was observed as it re-sprouted from rhizomes (underground stems). Supporting this regeneration, fire acts to recycle nutrients, with nutrients provided by ash from leaf litter and other plant material on the floodplain floor.

> *"If this plant is no longer available on Country, then my connection to my heritage and our traditional practices have been impacted. If the plants are healthy, we can harvest the reed for weaving. If the plants are not healthy the reeds won't be healthy and cannot be used. This tells us that there is something wrong. This is our barometer check of healthy Country".*
>
> Denise Morgan-Bulled, 2020

The *Carex* that was not burnt (6) noticeably had less re-sprouting compared to the *Carex* that was. It was also noticeable that less leaf litter was on the ground at the burnt site. When a cool, cultural burn is undertaken, efforts are made to protect important trees prior to the burn (1) and the slow and moderate nature of the burn allows plant regeneration. When the area is not cleared around the tree, fire can burn the trunk below ground. A tree stump (2) which had been burnt shows how fire can burn the roots of larger trees.

Water is important to *Pama* and to the weaving species *Carex*. This project allowed the influence of fire to be investigated by the Yorta Yorta as an additional management tool to help recover the species. Yorta Yorta Nation and water agencies can continue to work together to deliver water to heal Country and to further investigate the role of fire in delivering better cultural and environmental outcomes.

1. Older and cultural trees showing clearing undertaken to provide protection from the burn (Photo: Sonia Cooper)
2. A different tree stump is charred, showing the importance of clearing around trees (Photo: Sonia Cooper)
3. New regrowth of burnt *Carex tereticaulis* tussock

4. New regrowth of burnt *Carex tereticaulis* tussock
5. New regrowth of burnt *Carex tereticaulis* tussock
6. Unburnt *Carex tereticaulis*

Sharing traditional knowledge through The Living Murray Indigenous Partnerships Program

Reflections from two Ngarrindjeri Traditional Owners, South Australia

"It's important to capture water interests, valuing First Nation knowledge, while having true equitable engagement that also incorporates First Nations as part of the decision-making process."

– Tim Hartman

The Living Murray Indigenous Partnerships Program (IPP) aims to support Indigenous contribution to the planning and management of water for the environment activities at sites of cultural, ecological and community significance along the River Murray. The IPP facilitates exchanges of knowledge, information, perspectives and histories at each of the sites across government and non-government groups. Engagement occurs through either an officer employed as an Indigenous Facilitator to connect agency staff with First Nations groups, via project-based work on-Country, or a combination of both. The Program also connects people and Country through activities such as community tours, learning days and cultural mapping exercises.

Grant sharing knowledge and stories with IPP forum participants.

In 2019–20, the IPP continued to support genuine and culturally appropriate engagement with First Nations people in the use of water for the environment. Through a range of activities and projects, First Nations groups worked together with agencies to plan water use, connect to Country, share knowledge between generations, participate in two-way exchanges between Cultural science and Western science, undertake learning and training opportunities, and implement cultural practices at key sites along the River Murray.

Sharing knowledge between people is critical to the success of delivering water for the environment. In November 2019, agencies, Traditional Owners, scientists and community members met in Victor Harbor, South Australia, for the second Living Murray Icon Site Manager and Indigenous Partnerships Program Forum. Over three days, Traditional Owners from across the Murray-Darling Basin shared knowledge of the important projects being delivered to improve environmental water delivery.

The Living Murray Indigenous Partnerships Program forum, November 2019. (Photo: SA DEW)

These included adding cultural perspectives to water planning, the identification and protection of culturally significant sites, reducing pest plants and animals and the monitoring of totemic species. The Indigenous Facilitators from each site presented alongside Icon Site Managers and Traditional Owners, providing holistic updates which included cultural perspectives on locations and activities.

Participants were welcomed to Ngarrindjeri Country with a smoking ceremony and Yidaki demonstration. In the afternoon, two Traditional Owners – Grant Rigney and Tim Hartman – led a cultural walking tour to Granite Island (Kaiki) where participants learned of the cultural connection to the site, including the important creation story of Ngurunderi; while also learning about traditional use of native plants and animals.

Community representatives and scientists joined the group for a field trip on day two to share their knowledge of the Lower Lakes and Coorong and talk of the impacts they experienced through the Millennium Drought.

The group heard of the critical importance of maintaining freshwater flows throughout the River Murray system down to the Murray Mouth. These flows are integral for maintaining a healthy ecosystem and a thriving community. Knowledge was shared between government and non-government staff, Traditional Owner groups, community members and scientists to improve how we look after the river system from source to sea.

This is the second time an IPP Forum has brought together Traditional Owners from across The Living Murray Icon sites. Both forums have been an overwhelming success, facilitating information exchange across sites and providing an enriching, supportive and respectful learning experience for all involved. Following the forum, Grant and Tim were interviewed to reflect upon what it meant to host the forum on Ngarrindjeri Country. Tim reflects on the success of the event for sharing knowledge and making new connections, while Grant reflects on his long-standing role in water management and as one of The Living Murray's Indigenous Facilitators.

Reflections by Tim Hartman, Ngarrindjeri Aboriginal Corporation (NAC), on the IPP forum

How has this forum made a difference to the environment, people and place?

This forum provided the opportunity for various State and Commonwealth Government agencies to engage with First Nation groups on the ground and gain a perspective of First Nation values and interests. It also allowed water managers to be better informed on making decisions with regard to meeting their work priorities while also improving planning for Indigenous engagement.

What did you enjoy or find rewarding?

I enjoyed sharing my knowledge and appreciation of my Country to others. The forum provided a good networking experience for First Nation groups formally as well as informally. Getting to know people informally (e.g. while sharing dinner around a BBQ) is a very important component as it helps to build stronger relationships and helps establish trust in the sharing of information. Face to face engagement is very important.

The location of the forum was also very appropriate being at the end of the Murray-Darling Basin. All decisions are generally made upstream and directly affect the end of the system. Our lands and waters are shaped by decisions outside of our jurisdiction so it's important to showcase how the Lower Lakes, Coorong and Murray Mouth at the end of the system is responding or being affected.

What can others learn from the experience?

The IPP Forums provide an opportunity for others to gain an understanding and an appreciation of the lands, waters and values of Indigenous knowledge, to help inform the various government agencies in the management of important sites.

For non-Aboriginal staff participating in the IPP Forums, it helps build relationships firsthand with First Nation individuals and groups, which helps to inform decision-making and planning.

The forum at Victor Harbor provided a number of inspiring opportunities including:

- Additional First Nations people (other than TLM Indigenous Facilitators) to see parts of the Country that they may not normally see or have access to (e.g. tour of the barrages). This helps First Nations to reconnect to their own Country.
- A place for First Nations people to engage with government agency staff more broadly, this increases First Nation understanding of the work being done by governments while fostering connection and a future willingness to engage.
- Sharing of knowledge within a First Nation group (e.g. Ngarrindjeri to Ngarrindjeri) but also with other First Nation groups and vice versa. It was a good opportunity to hear other community stories and see and hear their Country through their eyes.

What improvements could be made to future TLM IPP forums?

From an Indigenous perspective, there should be a First Nation to First Nation only component to allow Nation groups to openly talk with one-another, and for many, this might be the first time they have met one another.

Other improvements could be:

- Allow more time on Country to encourage further discussion and sharing of ideas.
- More information could be circulated ahead of the forum so a more organic discussion of achievements and learnings could be had.
- Creating opportunities for conducting group work on Country.
- Ability for First Nation Indigenous Facilitators to be MC for all or part of the event and for them to lead or guide discussions on current and emerging challenges. Good opportunity for them to celebrate achievements.

Reflections by Grant Rigney on the role of being Ngarrindjeri Water Coordinator and Living Murray Indigenous Facilitator

Firstly, how important to Ngarrindjeri is a healthy river and wetland system, particularly the River Murray flowing to the Lower Lakes, Coorong and Murray Mouth?

It is absolutely essential for water to flow into, around and through Ngarrindjeri Ruwe (Country). Ngarrindjeri see that all living things are connected – this includes the water as a living entity. The lands and waters must be healthy for the Ngarrindjeri to be healthy. Water must flow out of the Murray Mouth to flush salt and nutrients out of the system, which will enable the Murray Mouth to remain open and in its natural state of connectivity.

When did you first start working as an Indigenous Facilitator / Water Coordinator as part of The Living Murray Indigenous Partnership Program?

I started in 2005 as the Indigenous Facilitator through The Living Murray Program for the Coorong, Lower Lakes and Murray Mouth Icon Site within the former Department of Water Land Biodiversity and Conservation.

What are some of your key highlights/ memorable moments in working in this role?

One absolute key highlight in this role was playing an integral part in Ngarrindjeri winning the Australian Riverprize in 2015 through collaborative engagement with the former Department of Environment, Water and Natural Resources. This recognition of years of hard work was very rewarding. The Australian win also put Ngarrindjeri on the world map through further nomination for the International Riverprize which was held in New Delhi, India. Building partnerships and relationships through a shared vision gives us the rich outcomes that we are trying to achieve for the Lower River Murray, Lower Lakes and Coorong wetlands and tributaries. Another highlight for me in particular is the wonderful people you meet on the way, which leads to long-lasting friendships.

What are some of the functions of an Indigenous Water Coordinator?

The Ngarrindjeri Water Coordinator's core functions are variable. This includes representing Ngarrindjeri on the regions Community Advisory Panel (CAP) to provide an update on Ngarrindjeri Aboriginal Corporation (NAC) activities and then reporting back to the NAC Board on CAP discussions; facilitating heritage assessments within the Coorong and Lower Lakes; engaging and supporting monitoring as part of TLM Lower Lakes threatened fish monitoring program; providing Ngarrindjeri input (culturally appropriate) into new and emerging projects relating to water management and ecology; facilitating Ngarrindjeri environmental watering priorities into barrage operations, including Lower Lakes water levels; presenting at environmental forums and World Wetlands Day events; facilitating and presenting at TLM Icon Site Managers Forums; and coordinating and chairing Water Resource Planning Statement of Commitment meetings with the current Department for Environment and Water. The Ngarrindjeri Water Coordinator also facilitates, mentors and coordinates various other deliverables under the Murray-Darling Basin Plan.

Ngarrindjeri Working on Country (WOC) staff have assisted The University of Adelaide with annual fish surveys for The Living Murray Program. Can you explain how this work and relationship with scientists has benefitted Ngarrindjeri WOC staff?

Ngarrindjeri citizens engaging with scientists, particularly from the University of Adelaide as part of TLM has had a two-prong effect. One, it enables Ngarrindjeri to get a handle on how native fish populations are faring in the water reform sector through the Basin Plan (i.e. availability of water quality and quantity). Two, this initiative also allows Ngarrindjeri Working on Country staff a hands-on approach to the Western scientific analysis of native small-bodied fish in laboratories. It is also a precursor to establishing long-term relationships and partnerships.

The major benefits that come out of these particular works is that Ngarrindjeri WOC, youth and Elders can receive upskilling and exposure to Western platform and then can meld their knowledges (Traditional) into that arena of Western Sciences.

How has Water for the Environment benefitted First Nations and particularly Ngarrindjeri?

Some benefits have occurred for Country, and First Nations are seeing this throughout the Murray-Darling Basin. It is still early days to see the benefits from water for the environment, however, there are signs with improved fish numbers, better vegetation and improved flows to the end of the system. The difficulty however is the expectation that Ngarrindjeri must prioritise one wetland over another which is a terrible situation to be in. It's like asking what is more important – your left arm or your right. Ngarrindjeri view the whole of Country as equally important. Continued flows to the end of the system is seen as critical to ensuring the health of Country and people.

How can the Indigenous Partnership Project improve or what would you like to see incorporated for the future?

I believe that the Indigenous Partnerships Program (IPP) can improve significantly into the future with more funding. This would allow Ngarrindjeri to achieve a secure future to support and build their economic base through research, ecological restoration, eco-tourism and cultural tourism, natural resource management and fisheries management, just to name a few.

Thank you

The effective management of water for the environment relies on the contributions and efforts of many land and water organisations and communities across the Basin.

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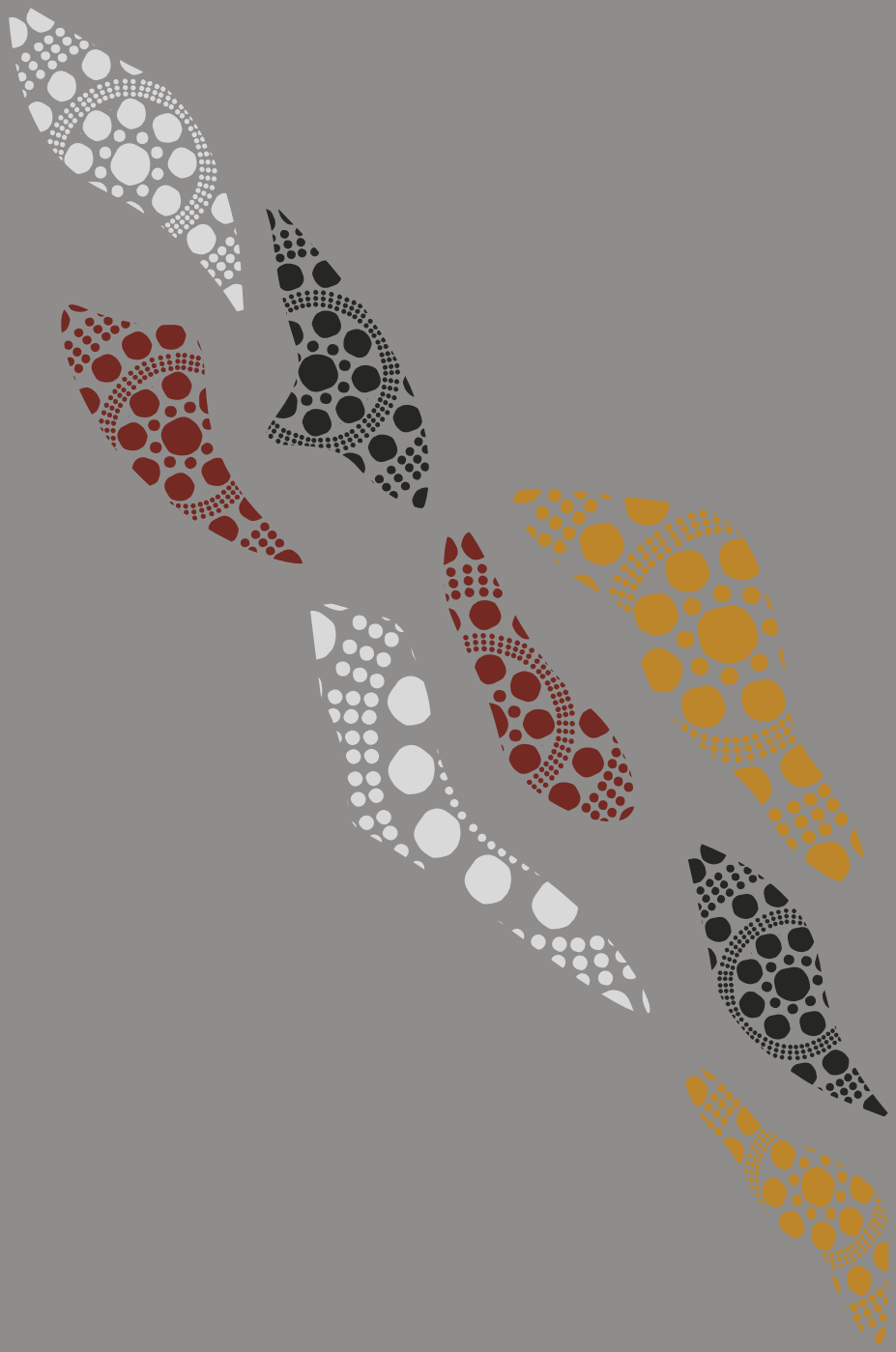

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