Cultural water and the Edward/ Kolety and Wakool river system

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AIATSIS
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YARKUWA
INDIGENOUS KNOWLEDGE CENTRE
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Shortened forms

AIATSIS	Australian Institute of Aboriginal and Torres Strait Islander Studies
ATSISJC	Aboriginal and Torres Strait Islander Social Justice Commissioner
CEWH	Commonwealth Environmental Water Holder
COAG	Council of Australian Governments
CSIRO	Commonwealth Scientific and Industrial Research Organisation
DAWP	Deniliquin Aboriginal Working Party
DLALC	Deniliquin Local Aboriginal Land Council
DSE	Victorian Department of Sustainability and Environment
DWR	Department of Water Resources, New South Wales
DWE	NSW Department of Water and Environment
EWAG	Environmental Water Advisory Group
IPA	Indigenous Protected Area
JIG	Joint Indigenous Group
LALC	Local Aboriginal Land Council
MATG	Murray Aboriginal Technical Group
Murray CMA	Murray Catchment Management Authority
MDBA	Murray–Darling Basin Authority
MDBC	Murray–Darling Basin Commission
MDBMC	Murray–Darling Basin Ministerial Council
MLD EWAG	Murray Lower Darling Environmental Water Advisory Group
MLDRIN	Murray Lower Darling Rivers Indigenous Nations
MWWG	Murray Wetlands Working Group
NAILSMA	North Australian Indigenous Land and Sea Management Alliance
NBAN	Northern Basin Aboriginal Nations
NOW	NSW Office of Water
NRC	Natural Resources Commission
NWCPAG	National Wildlife Corridors Plan Advisory Group
NWI	National Water Initiative
NSW NPA	National Parks Association of NSW
OEH	NSW Office of Environment and Heritage
SEWPAC	Department of Sustainability, Environment, Water, Population and Communities
TAFE	Technical and Further Education
WANT	Werai Aboriginal Negotiating Team
Yarkuwa	Yarkuwa Indigenous Knowledge Centre
YYNAC	Yorta Yorta Nation Aboriginal Corporation

Acknowledgments

The authors acknowledge Wamba Wamba and Perrepa Perrepa traditional owners and pay respect to elders past, present and future.

This report is the result of a research partnership between Yarkuwa Indigenous Knowledge Centre Aboriginal Corporation (Yarkuwa) and the Australian Institute of Aboriginal and Torres Strait Islander Studies (AIATSIS). The work has been supported as an AIATSIS Council research project.

The project originated in discussions between AIATSIS and Yarkuwa in 2010. It builds on work between the two organisations and on AIATSIS's work with Murray Lower Darling Rivers Indigenous Nations and traditional owners along the Murray River on water management and cultural flows (including Ross 2009; Weir 2009; Weir and Ross 2007; and Morgan, Strelein and Weir 2004).

During the fieldwork for this research, Yarkuwa held a workshop with the Commonwealth Scientific and Industrial Research Organisation (CSIRO) for the Murray–Darling Basin Authority (MDBA) project 'The Multiple Benefits of the Basin Plan'. CSIRO and AIATSIS collaboratively co-documented the workshop.

The authors thank Yarkuwa staff, board and members for their support and insights. Jessica thanks Tran Tran and Nick Duff of AIATSIS for their collegial discussions on cultural flows. We also thank Nick Duff and David Leslie for their feedback on an earlier version of this report, and Pauline McGuire for her editorial expertise. Any errors or omissions remain the responsibility of the authors.

Methodology

This research developed out of a partnership between AIATSIS and Yarkuwa that considered the complexity of the cultural water agenda, and water reform more broadly, in the Edward/Kolety and Wakool river system. It has coincided with research and planning for environmental flows for these same rivers (Webster 2010; Hale & SKM 2011).

During the fieldwork, a meeting with the Yarkuwa board identified a number of priorities for the research, including that it provide:

- an overview of governance issues and stakeholders involved in water management in the Edward/Kolety and Wakool river system
- identification of the diversity of Indigenous governance bodies with land and water interests in the Edward/Kolety and Wakool river system
- a discussion of cultural water that identifies values broader than the emphasis on a water allocation in competition with other users.

This research also draws on three Yarkuwa documents that interlink cultural and environmental values, authored by David and Jeanette Crew (Yarkuwa 2008, 2009 and 2012a). The project was scoped around the geographic area known as the Edward/Kolety and Wakool river system, with a focus on the work and priorities of the Yarkuwa board and broader membership. It was not broad enough to include spending time with the other Indigenous organisations and governance bodies in the Edward/Kolety – Wakool.

Our research methods included the review and analysis of literature, as well as workshops, meetings and interviews with Indigenous and non-Indigenous people. The workshops and meetings were all held in Deniliquin and took place as follows:

- scoping meeting on 7 December 2010 between Yarkuwa, AIATSIS and the NSW Department of Environment, Climate Change and Water
- AIATSIS workshop with Yarkuwa board on 17 August 2011 to discuss the first draft of the research report and develop a cultural flows definition and principles
- Yarkuwa Effects of Sustainable Diversion Limits workshop with CSIRO on 8 September 2011 to discuss cultural and historical information and aspirations for future management
- Yarkuwa membership meeting on 20 September 2011, where the cultural flows definition and principles were endorsed.

Steven Ross also attended monthly Yarkuwa board meetings where he outlined and received endorsement for the project, updated progress of the research, and discussed additional aspects of the cultural flows definition and potential governance models. Notice of the meetings and the project appeared in two editions of Yarkuwa's *Nyernila Newsletter*. Jessica Weir conducted interviews with Yarkuwa members Debbie Flower, David Crew (a co-author) and Leo Briggs Jnr to complement the workshops and meetings. She visited North Deniliquin forest twice, once with Debbie Flower and her sons Patrick Moore and Jonathan Moore, and once with Debbie and co-authors Jeanette Crew and David Crew. Werai Forest was inaccessible during fieldwork because of heavy rains.

As a Murray Catchment Management Authority board member, Steven Ross also discussed this project with the Commonwealth Environmental Water Holder at the meeting 'Western Murray Catchment Community Water Meeting: Edward–Wakool System', hosted by the Murray CMA, in Deniliquin on Wednesday, 10 August 2011.

In conjunction with the meetings and workshops, Steven Ross prepared a project brief and visioning paper, which was circulated twice to Yarkuwa board members and to the Murray Catchment Management Authority. Yarkuwa board members' contributions to the paper included information on cultural aspects of the rivers and forests.

Finally, we declare the interests of the authors in this project. Steven Ross, Jeanette Crew and David Crew have significant familial ties to Yarkuwa and the case study area. Steven identifies as Wamba Wamba, Jeanette identifies as Mutthi Mutthi. Steven, Jeanette and David are immediate family. Steven was employed by Yarkuwa to assist with this report. David is the manager of the centre and Jeanette the chair.

Note on spelling and terminology

There are many different spellings for the two traditional owner groups whose country encompasses the Edward/Kolety and Wakool rivers, including Wamba Wamba or Wemba Wemba, and Perrepa Perrepa or Barapa Barapa. In this report we have chosen to use Wamba Wamba and Perrepa Perrepa; however, the other spellings are just as commonly used.

When using the name Werai Reserve we also mean those forests situated on the floodplain of the Edward/Kolety and Niemur rivers between Yadabal lagoon and Morago and including the Barratta Creek Forest, the Banangalite Forest, Werai Forest, Morago Forest and Stevens Weir Forest as defined by the NSW Natural Resources Commission (2009). During the past 150 years this area has been referred to as individual state forests, the Werai Group of Forests and the Werai Forest Group. In this report this area is referred to as the Werai Reserve or Werai.

Introduction

Indigenous people in south-east Australia have developed strategies and theories around the allocation of cultural water and the broader notion of 'cultural flows' in response to two key triggers: the poor environmental health of the inland river country and the historic and contemporary failure of the Australian state and common law to recognise the property rights and political status of Australia's first nations. In the Murray–Darling Basin, the very recent marked decline in river health and long history of agricultural settlement and colonisation are felt acutely by the traditional owners, whose ancestral homes are now inseparable from the new communities based on the agricultural and irrigation industries. In this paper we consider the experiences of the Wamba Wamba and Perrepa Perrepa people and the work of one of their key organisations, Yarkuwa Indigenous Knowledge Centre Aboriginal Corporation. The discussion does not encompass the whole of Wamba Wamba country but focuses on the Edward/Kolety[1] and Wakool rivers and the town of Deniliquin, where Yarkuwa is based. The issues of water scarcity, drought and increased temperatures with climate change provide the context for this research, although the project started during a series of wet years, which immediately followed the long drought that dominated the start of the 21st century.

Water management has had a profound impact on this country, and Yarkuwa is keen to facilitate discussion and research on the full and meaningful participation of traditional owners in decisions about water management. The Yarkuwa board and membership argue strongly for the inclusion of cultural flows in the Edward/Kolety – Wakool river system, and this paper explores the meaning and potential of this. No cultural water allocation has been secured for the Edward/Kolety and Wakool rivers; however, this research has been supported by Yarkuwa as part of building capacity among both Indigenous and non-Indigenous people for cultural water governance in the Edward/Kolety – Wakool.

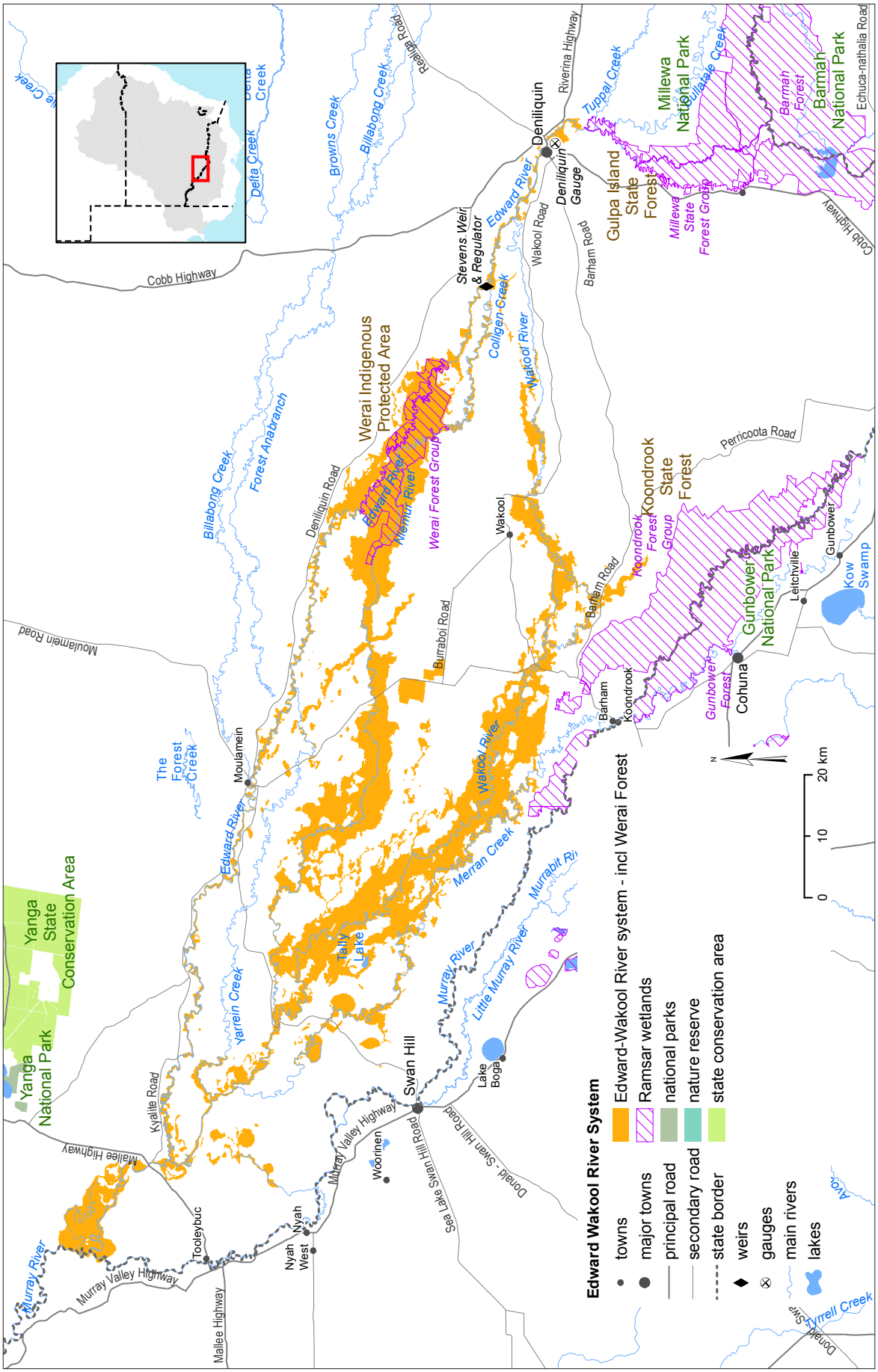
The Edward/Kolety and Wakool rivers, forests and floodplains

> These forests were our economic base for thousands of years and now provide no economic return for my people while at the same time making many non-Aboriginal people wealthy. My people's spiritual and religious connection to county are directly linked to, and cannot be separated from, the environment.
>
> Jeanette Crew, Mutthi Mutthi elder and co-author of this report (Yarkuwa 2009, p. 5)

The Edward/Kolety and Wakool rivers form an anabranch and floodplain of the Murray River, north of the Murray in southern New South Wales. Most of this area is Wamba Wamba and Perrepa Perrepa country, with Perrepa Perrepa country to the north-east and Wamba Wamba to the south-west. Their country is directly downstream from Yorta Yorta country, where the Edward/Kolety River starts. Wamba Wamba and Perrepa Perrepa have the same language, and their name for the Edward River is the Kolety (pronounced Kol-etch). Kolety is now gazetted as a dual name for the Edward River (NSW Government Gazette 2006). Wakool (pronounced War-kool) is the Wamba Wamba and Perrepa Perrepa name, and their name for the Murray is Mile (pronounced Milly). Traditional knowledge contains a creation story relating to the formation of the Edward/Kolety and Murray system by the creation snake, who was cut into pieces by the crow that was disturbed at Kyalite, where the Edward/Kolety and Wakool rivers meet (Massola 1968).

[1] This is a gazetted dual name for the Edward River (NSW Government Gazette 2006).

Map 1: Map of the Edward/Kolety and Wakool river networks



Source: Hale & SKM 2011, p. 5. Map published courtesy of the Murray–Darling Basin Authority. Please note that this map identifies the Werai Indigenous Protected Area; however, negotiations about this transfer are still underway and it has not yet been declared.

The Edward/Kolety and Wakool river network encompasses 1000 square kilometres of interconnecting rivers, creeks and wetlands (Hale & SKM 2011, p. 3; see Figure 1). Forests became established here as a result of changes to the Murray River's path 25,000 years ago, when rivers and creeks, floodplains and wetlands were formed, providing the right conditions for river red gum forests to thrive (NRC 2009, p. 21). Under state forestry legislation, these river red gum and box forests have become known as the Werai Group of Forests (or the Werai State Forest Block) and include the Werai, Morago, Banangalite and Barratta Creek state forests. The largest forest of this group is the Werai, which is connected to the Edward/Kolety River by Colligen Creek. Together, the Werai State Forest Block comprises around 11,915 hectares. To the near south is the Koondrook–Perricoota Forest and wetlands, which receive water flows from the Murray and not the Edward/Kolety and Wakool rivers. But, if the flood is big enough, water from the Murray and Koondrook–Perricoota will flow into the Wakool, which then flows into the Edward/Kolety.

Country

For more than 10,000 years the forests and plains of this country have been occupied by Indigenous people. This country has supported cultural activities, provided a stable and secure food source, and been a site of other resource use and exploitation. Sandhills provided a place of retreat from floods and a location for burials (Yarkuwa 2008). Records suggest that prior to European occupation 3000 people lived in the Werai Group of Forests alone (Yarkuwa 2009, p. 5). This is evident from the more than 100 oven mounds, 100 scarred trees and six traditional cemetery sites found in the Werai Group (Yarkuwa 2009, pp. 5, 7–8). Over the course of the last 150 years the Werai forests have been grazed and logged but continue to be valued by many traditional owners as *home* (original emphasis, Yarkuwa 2009, p. 3). In the 1920s, the Werai forests were formally vested as state forests and managed as commercial logging operations.

From the early 1800s to the mission era, the forests sheltered thousands of Indigenous people from the inexorable force of colonisation. In the late 1800s, some 80 Aboriginal people were forcibly removed from the Werai forests onto missions and reserves in the surrounding area, in particular to Moonahcullah mission. Moonahcullah is the closest Aboriginal reserve to Werai and adjoins the forest at the south-western end. Title to this land was transferred to the Deniliquin Local Aboriginal Land Council in 1983. The contemporary Aboriginal community in Deniliquin are largely the descendants of those 80 people. The traditional owners speak about their family connections to the Werai Reserve Forest as an important reason for ongoing visits to this country (participant contribution, Yarkuwa–CSIRO workshop, 8 September 2011).

The Werai Reserve is surrounded by strikingly flat plains, which are now dominated by freehold land tenures and include three local government areas: Conargo Shire Council, Murray Shire Council and Wakool Shire Council (Hale & SKM 2011, p. 4). Sheep have been an important dryland farming industry in this area. With the construction of the Mulwala Canal in the 1930s, irrigation districts were established, and irrigated rice became a very important industry (DWR 1994, pp. 8–10). Members of the Wamba Wamba and Perrepa Perrepa community have found employment in this activity, including work at the Deniliquin rice mill, and were celebrated for being 'big-gun' shearers (Hercus 1992, p. 15).

The Wamba Wamba and Perrepa Perrepa values of the Werai Forest were reported on in a submission Yarkuwa made to the investigation by the NSW Natural Resources Commission into forest values (Yarkuwa 2009). This submission included cultural locations such as:

- burials
- oven mounds
- scarred trees
- story sites
- stone artefacts.

The Yarkuwa submission listed exploited resources as:

- red gum trees—multiple use
- grasses and herbs—river mint, old man weed, flax lily et cetera
- sedges—baskets
- cumbungi—string and food resource
- rookeries—food and habit resource (Yarkuwa 2009, pp. 4–5).

Throughout the course of this research, the traditional owners repeatedly emphasised how important these forests were and continue to be for their health. The forests not only provide health benefits but also are important for cultural economy and industry, and for religious and spiritual connection. Cultural economy is a term the traditional owners use to highlight the economic values of country, to emphasise the relationship between their culture and economy, and to situate these values within contemporary Indigenous traditions (Weir 2009, pp. 129–34).

In 2009–10 the local traditional owners of Werai Forest were involved in a use and occupancy mapping project conducted by the Murray–Darling Basin Authority in conjunction with the allied Murray Lower Darling Rivers Indigenous Nations, Yarkuwa and the Deniliquin Local Aboriginal Land Council. The mapping technique used has been developed and utilised by First Nations peoples in Canada for almost 30 years and more recently is being developed in Australia (Tobias 2009; Ward 2009). The methodology relies on information obtained in interviews about diverse activities on country. This information forms the basis of GIS mapping of sites that correspond to the respondents' direct connection to country, use of resources and occupation of land. Almost 80 Wamba Wamba and Perrepa Perrepa traditional owners were interviewed, mapping on average approximately 120 sites each, with a total of over 12,000 sites identified for the Werai Forest.

On 1 July 2010 the Werai Reserve became vested with the New South Wales Minister for Environment and Climate Change for transfer to Aboriginal ownership (Schedule 6, *National Park Estate (Riverina Red Gum Reservations) Act 2010* (NSW)). This is part of a process of having Werai considered for declaration as an Indigenous Protected Area (IPA). An IPA for Werai is supported by the Natural Resources Commission (2009). It is also a product of intense lobbying and advocacy by local traditional owners, particularly Yarkuwa (see also NSW NPA 2008). In 2009 Yarkuwa received funding from the Indigenous Protected Area program to undertake an IPA consultation project, supported by Forests NSW (now Forestry Corporation of NSW), to investigate joint-management options for Werai (Yarkuwa 2009, p. 4). Since 2010, Yarkuwa has maintained a supporting process to enable the transfer to take place. The IPA consultation process may result in a full hand-back of Werai Forest by 2013. The Werai Aboriginal Negotiating Team (WANT) was established in 2011 to oversee the transfer of the land to an Aboriginal title-holding body and explore the potential to declare the area as an IPA.

Ecology

The Werai forests are recognised as regionally, nationally and internationally significant forests and wetlands. They are part of the largest complex of tree-dominated wetlands in southern Australia, supporting threatened species and providing an important habitat for birds and fish at crucial times, such as during migration and breeding, or as drought refuge (OEH 2012). However, this role is threatened by environmental change, as clearly evidenced by the poor condition of the forest trees. In conjunction with non-government environmental organisations, the traditional owners have helped document ecological values as part of a larger lobbying effort to transfer Murray River State Forests to conservation land tenures.

On the floodplains of the Murray and its anabranches (the Murray Fans region), the Werai Reserve is the third-largest remnant of the original vegetation. In 2003 the Werai block, as part of the NSW Central Murray State Forests site (which includes Millewa and Koondrook–Perricoota), was designated a Ramsar wetland of international importance. The forests of the Werai block are also recognised as wetlands of national importance on the Directory of Important Wetlands in Australia. The Werai is identified as an Indicative Key Area for the health of the adjacent forests and river system, and thus has a key role in monitoring conservation values (Todd & McDonnell 2003, p. 17, cited in Yarkuwa & the Murray Country Project with Osler, McGregor & the NSW NPA 2009). The Edward/Kolety – Wakool was also recognised as a wildlife corridor of national importance in the draft National Wildlife Corridors Plan, although the final plan does not specify any areas (NWCPAG 2012a, pp. 67–68; NWCPAG 2012b).

The forested wetlands and ephemeral creeks of the Edward/Kolety – Wakool support a high proportion of native fish and play an important role in providing a bioregional context for aquatic species recruitment (Hale & SKM 2011, p. 8). Permanent pools provide important drought refuges for the

threatened species Murray cod, trout cod, eel tailed catfish and silver perch (Hale & SKM 2011, p. 8). Lagoons, floodplain marshes and the river red gum forests together support habitat for waterbirds to breed, and significant breeding events have been observed (Hale & SKM 2011, p. 9).

Forests NSW, the former managers of the Werai Reserve and the North Deniliquin State Forest, documented the condition of the forests, albeit from the perspective of forestry management and thus focusing on timber types and their productivity (Yarkuwa & the Murray Country Project with Osler, McGregor & the NSW NPA 2009, p. 26).[2] From this information, it appears river red gums of low productivity are by far the dominant vegetation, covering 70 per cent of the study area (Yarkuwa & the Murray Country Project with Osler, McGregor & the NSW NPA 2009, p. 27). High-productivity red gum forests were found in only seven per cent of the study area, mainly along the Edward/Kolety River and Colligen Creek (Yarkuwa & the Murray Country Project with Osler, McGregor & the NSW NPA 2009, p. 26). Other vegetation types identified were box trees, a mix of red gum and box, and open plain or swamp areas. The data clearly reveals the lack of value of these forests for timber production. Moonahcullah, which has areas of black box and red gum forest and is owned by the Deniliquin Local Aboriginal Land Council, was not included in the Forests NSW study area.

Table 1: Forest NSW study of the extent of vegetation types (in hectares) in the Werai Group of Forests and the North Deniliquin State Forest study area

Forest type	Deniliquin	Werai	Barratta Ck	Banangalite	Morago	Stevens Weir	Total	Percentage
Red gum SQ1—high productivity	31	611	90	149	50	3	934	7
Red gum SQ2—low productivity	109	3,923	73	726	584	109	5,524	44
Red gum SQ3—low productivity	11	2,480	42	403	341	17	3,294	26
Red gum/box	194	218	0	0	53	25	490	4
Box	57	805	0	0	41	0	903	7
Open plain or swamp	4	1,108	10	19	25	10	1,176	9
Water body	3	159	24	4	12	0	202	2
Untyped, unproductive or unknown	13	0	0	0	21	0	34	0
Total	422	9,304	239	1,301	1,127	164	12,557	100

Source: Yarkuwa & the Murray Country Project with Osler, McGregor & the NSW NPA 2009, Appendix 1, p. 27

The Forests NSW data also records 96 species of native fauna: 77 bird species, two reptiles, one amphibian, four mammals and 12 bat species. Of these, there are five threatened species: diamond firetail, grey-crowned babbler, speckled warbler, brush-tailed phascogale and turquoise parrot. Within a 10-kilometre radius of the study area there are an additional 10 threatened species. These are:

- Australasian bittern
- square-tailed kite
- brolga
- painted snipe
- Major Mitchell's cockatoo
- superb parrot
- barking owl
- painted honeyeater
- regent honeyeater
- hooded robin

[2] The National Parks Association of NSW obtained this data under licence from Forests NSW, the Department of Environment and Climate Change and Birds Australia for the Murray region.

To gauge these figures, Yarkuwa teamed up with the community organisation the National Parks Association of NSW and others to undertake local wildlife surveys (Yarkuwa & the Murray Country Project with Osler, McGregor & the NSW NPA 2009). The surveys were conducted from 11 to 14 November 2008 at eight locations—six in the Werai State Forest and two in the Deniliquin State Forest (for methodology see Yarkuwa & the Murray Country Project with Osler, McGregor & the NSW NPA 2009, p. 10). The survey work identified 80 species, which mostly were common woodland and forest birds for river red gum forests. Of these 80 species, 25 had not previously been recorded, making a total of 121 native fauna species in the study sites. The new species identified included five frog species, four reptile species, 15 bird species and one bat species. Of these, there were several important recordings, such as the inland forest bat and the diamond firetail, which are listed as vulnerable in Schedule 2 of the *Threatened Species Conservation Act 1995* (NSW). The crested shrike-tit, white-browed woodswallow and varied sittella were also new recordings and are either rare or declining species of regional significance (Webster 2005 cited in Yarkuwa & the Murray Country Project with Osler, McGregor & the NSW NPA 2009, p. 19). Environmental lobbyists and Yarkuwa drew on this information to support their lobbying efforts to have the forests re-classified as conservation lands.

Forests, water, culture

Regulation of variable flooding regimes has been central to the declining health of the Werai forests and the culture that lies within them. The main altered flow regimes affecting the Edward/Kolety – Wakool are:

- a reduction in the frequency of low and no flow events
- the rapid rise and fall of water in channels
- a reduction in the duration of moderate floods
- changed seasonality of flows and a loss of flood pulses important for breeding cues
- barriers to fish passage (Hale & SKM 2011, p. 9).

Water flow in the Edward/Kolety River is kept at high levels for most of the year, at or near the capacity of the river banks, so as to meet orders for downstream irrigation water allocations. Areas that used to be flooded almost yearly now only receive infrequent water flows. Wamba Wamba man Leo Briggs Junior has noticed the changes:

> You can tell where water used to be, and the river could be full, but there's still no water there. And then you'll have a look and there will be a levy bank somewhere (interview with J Weir, 7 September 2011).

River regulation is part of broader land use changes in the region, including the allocation of water for irrigation, land clearing, salinity, invasive species, mining, and habitat degradation from logging, grazing and other activities (Yarkuwa & the Murray Country Project with Osler, McGregor & the NSW NPA 2009, p. 14). With climate change, it is anticipated that there will be less rainfall and higher evaporation, compounding the impact of current land use change on local ecologies and the cultures they support. Indeed, such future climate change scenarios have already been experienced. In the first decade of the 21st century there were record lows in documented rainfall in what became known as the 'millennium drought'. For the traditional owners, land use change and drought have combined to diminish their relationships with the forests and freshwater ecologies, including their cultural economy and access to country.

Broad based public concern about the failing health of river red gum forests led the New South Wales Government to fund an investigation into river red gums and woodland forests in the Riverina Bioregion (NRC 2009). The Natural Resource Commission, which undertook this task, found that the vast majority of the Werai Forest trees were unhealthy (NRC 2009, Table 4.3, p. 78). It quotes a 2005 assessment of the Central Murray State Forests that recorded only 11 per cent of trees as healthy, 27 per cent as stressed and 35 per cent as highly stressed (NRC 2009, p. 76). Within this, the river red gums were

worse off than the black box forests, as the latter have more drought resilience. The report recognised the declining commercial values of these forests as a timber source and highlighted the many other values held in the forests, including Indigenous values.

In 2010 the New South Wales Government passed the *National Park Estate (Riverina Red Gum Reservations) Act 2010* (NSW) to transfer state forest lands to the national park estate. In July 2010 the Millewa Forest was declared a national park and conservation area; it was renamed as the Murray Valley National Park and Murray Valley State Conservation Area. Deniliquin State Forest become a regional park; however, Koondrook–Perricoota remains a state forest. The Werai Reserve became vested with the Minister for Environment and Climate Change, for transfer to an Aboriginal landholding body (s. 10). This was an outcome of negotiations held between Yarkuwa, Forests NSW and the Commonwealth Government's Indigenous Protected Area program (NRC 2009, p. 143; Yarkuwa 2009, p. 4). This transference began the process for an IPA for Werai.

Alongside this growing awareness of the imperative for management change there have been explorations into how to deliver water to the Werai for environmental purposes. In 2001 an environmental water allocation of 3261 ML was released into the eastern part of the Werai Reserve by the NSW Murray Wetlands Working Group, flooding approximately 130 hectares of wetland. This was a trial watering event to better understand how much water is needed before riverbanks are breached and water floods into the forest (NSW MWWG 2001; Bark et al. 2012). This is known as 'commence to flow' requirements.

The millennium drought put water plans and their planned water uses—environmental, cultural and consumptive—on hold. Water plans are made for each catchment in New South Wales and establish the rules of water use and allocation between people with different water licences, as well as water allocations to support the environment. In November 2006, the severity of the drought resulted in the suspension of the water-sharing plan for the NSW Murray and Lower Darling Regulated Rivers, which includes the Edward/Kolety – Wakool. Contingency water-sharing measures were put in place to ensure water supply for towns and communities, and regulated water flows to specific wetlands were cut off (MDBC 2007a). At the end of May 2007, the regulated flow to the Edward/Kolety – Wakool system was cut off, and the Wakool River and Merran Creek systems dried into a series of pools (MDBC 2007b, p. 5). General security water licence holders had their water allocation reduced to zero. Business and agriculture in Deniliquin suffered, and in 2008 the Deniliquin rice mill, the largest rice mill in the southern hemisphere, closed (Mitsch 2011, p. 2).

In the spring and summer of 2009–10, heavy local and upstream rains led to the recommencement of the water-sharing plan for the 2011–12 irrigation season. This has been followed by an upturn in the economy, with a return to full water allocations and the reopening of the Deniliquin rice mill. The rains also provided opportunities for environmental watering events in the Werai Reserve. In November 2009 and January 2010, the Tumudgery Cutting regulator was opened and the flooding event extended over approximately 346 hectares. The effect of the floods on the health of the Werai was evident in the responses by plants and animals, which included:

- growth and flowering of numerous wetland plants, including common reed, lignum, spike-rush species, spiny mudgrass and wavy marshwort
- improved health of river red gums
- foraging within environmental water by various fish
- laying of egg masses by frog species, and tadpole foraging
- foraging within environmental water by the eastern long-necked turtle
- foraging and breeding of numerous waterbirds, including the grey teal, the little pied cormorant and the white-bellied sea-eagle (Webster 2010, p. iii).

With more rainfall in the summer of 2010–11, the water ran over the top of the Tumudgery Cutting and Stevens Weir. There have been blackwater events related to these flows (Hale & SKM 2011, p. 9; MCMA 2012). Blackwater is when leaf litter is broken down rapidly, discolouring the water and reducing its dissolved oxygen content, which results in the death of fish and other aquatic life that depend on certain oxygen levels. Blackwater has always been a part of the variable flow of the river, but blackwater occurrences are also a result of the increased build-up of leaf litter on the forest floor as a result of reduced flooding.

A number of recommendations for the future management of environmental flows have resulted from the environmental watering of Werai. However, Indigenous peoples were not involved in the decision making about this environmental flow. This is primarily due to environmental flows being about environmental outcomes and not cultural outcomes, as reflected in their discussion, decision making, monitoring and assessment. The exclusion of traditional owners produced the following limitations:

- Sites of significance that were not considered by previous flows were again not considered.
- Cultural outcomes were not gauged — a missed opportunity.
- Access to cultural economic places was not gauged — again, a missed opportunity.
- The capacity of Indigenous peoples to engage in this and future processes was nil.
- Increased damage to cultural sites was not recorded.
- The flooding restricted access into the forest for everybody, including traditional owners.

Cultural flows

'Cultural flows' is a term Indigenous people in Australia have developed, along with Indigenous water allocations and others, in lobbying for greater recognition of their rights, relationships and responsibilities to their lands and waters (see, for example, Behrendt & Thompson 2003; O'Donnell 2011; Morgan, Strelein & Weir 2004; Ross 2009; NAILSMA 2009; Weir 2009). It is a complex term because of the interplay of Indigenous and non-Indigenous knowledge traditions, including different understandings of water and framings of Indigenous culture. Cultural flows challenge water management that narrowly understands water as a resource for human allocation and consumption (Weir 2009, p. 118). They are about country, the health of country and the culture embedded in country. There is no cultural flow from a dead river.

Cultural flows do not neatly fit within current regulatory frameworks, in part because of their holistic articulation of environmental, economic and cultural values (Weir 2009, p. 118). Because of this, Indigenous people and others have developed other terminology, including 'Indigenous water allocations' (Weir 2009, p. 204). Strategies are developing around a suite of approaches — environmental water, consumptive water, domestic water, native title water, cultural water, as well as participatory decision-making processes and others — that could be used in combination to meet some of the broader cultural flows agenda (Tran forthcoming; FPWEC 2012, p. 7). There is at times no clear distinction between the cultural flows agenda and the Indigenous water rights agenda; they have been deliberately matched with each other and they have also been inaccurately confused. The terms are constantly used by different people with different meanings for different purposes.

Developing an agenda

Nationally, there have been two significant areas of activity in lobbying for cultural flows and Indigenous water rights, with two very different water contexts: the over-allocated rivers of the Murray–Darling Basin, where there are two regional Indigenous water alliances (the Murray Lower Darling Rivers Indigenous Nations (MLDRIN) and the Northern Murray–Darling Basin Aboriginal Nations (NBAN)); and, the unallocated or under-allocated rivers of Northern Australia, where an alliance of Indigenous

groups, organisations and communities has formed under the name North Australian Indigenous Land and Sea Management Alliance (NAILSMA). Another significant group has been the First Peoples' Water Engagement Council, which has provided advice to the National Water Commission.

MLDRIN is an alliance of 10 nation groups from part of the southern Murray–Darling Basin, with two delegates from each nation attending meetings (Weir & Ross 2007). Wamba Wamba and Perrepa Perrepa are members of MLDRIN and participate through their nation delegates. In November 2007, MLDRIN delegates met in Echuca, Victoria to discuss the meaning, impacts and benefits of cultural flows.[3] At the Echuca meeting, MLDRIN delegates endorsed the following definition of cultural flows:

> 'Cultural Flows' are water entitlements that are legally and beneficially owned by the Indigenous Nations of a sufficient and adequate quantity and quality to improve the spiritual, cultural, environmental, social and economic conditions of those Indigenous Nations (MLDRIN 2007).

This definition combines the cultural flows agenda with the Indigenous water rights agenda, seeking the expression of cultural flows as a realisable entitlement that is then allocated every year as a quantifiable amount of water. This definition was subsequently endorsed by traditional owners from MLDRIN's member nations at meetings held throughout 2008. A variation of this definition was adopted by NAILSMA (2009).

As the MLDRIN definition states, a key part of the developing agenda on cultural flows has been the relationship between culture, contemporary Indigenous traditions, environmental values, economic livelihoods and other values that are sustained by freshwater ecologies. However, when Indigenous people use the word 'culture' to argue for their rights and interests they run the risk of narrow, non-Indigenous interpretations of 'culture' as limited to pre-colonial traditions, which are then also framed as uneconomic (Weir 2009, pp. 123–5). Using culture to express deeply meaningful Indigenous values can be a double-edged sword in that those values may then be narrowly recognised as a certain type of Indigenous culture—one that is set in the past and can never grow (Kalland 2003, p. 170; Tsing 2005, p. 9).

More recently, the First Peoples' Water Engagement Council has adopted the terminology 'Aboriginal water', in part because of limitations with the cultural flows terminology (FPWEC 2012, p. 12, although see Collins 2011). In its advice to the National Water Commission, the council has identified a combination of policy measures as necessary for meeting Aboriginal water requirements. These include partnerships to maximise outcomes from environmental water, research, coordination of water planning and management with Indigenous values, and monitoring and evaluation. Aboriginal water includes 'supplemental cultural flows where environmental water regimes are insufficient to meet all identified cultural values' (FPWEC 2012, p. 7). Aboriginal people are to have ownership and autonomy over these cultural flows, with no financial costs for allocation, storage, management or delivery (FPWEC 2012). Consumptive water allocations are argued for as a separate matter to Aboriginal water (FPWEC 2012, pp. 7–8). This approach reflects a diversifying engagement between Indigenous peoples and governments in the complex work of water governance.

Indigenous water policy, Indigenous water rights

The recognition of Indigenous values in water policies and the lobbying for cultural flows have resulted in a few opportunities for Indigenous people to return water to country, such as the cultural licence in the Murrumbidgee (ATSISJC 2008, p. 189; Jackson et al. 2010, pp. 85–106). However, MLDRIN and others argue that, more than an allocation in a water plan, Indigenous property rights to water must also be recognised.

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[3] Report co-author Steven Ross attended this meeting as the MLDRIN coordinator.

In 2004 Indigenous peoples' water issues were partially recognised in the National Water Initiative:

> 52. The Parties will provide for indigenous access to water resources, in accordance with relevant Commonwealth, State and Territory legislation, through planning processes that ensure:
>
> i) inclusion of indigenous representation in water planning wherever possible; and
>
> ii) *water plans* will incorporate indigenous social, spiritual and customary objectives and strategies for achieving these objectives wherever they can be developed.
>
> 53. Water planning processes will take account of the possible existence of native title rights to water in the catchment or aquifer area. The Parties note that plans may need to allocate water to native title holders following the recognition of native title rights in water under the Commonwealth *Native Title Act 1993*.
>
> 54. Water allocated to native title holders for traditional cultural purposes will be accounted for (COAG 2004).

The NWI is a guiding document for state and territory governments and has provided impetus for Indigenous groups and catchment management authorities to meet and reform water planning to include Indigenous representation and Indigenous water issues, including cultural flows. However, the NWI's applicability to cultural flows has two key limitations: it does not include economic values and thus fails to redress economic rights; and provisions 52 and 53 are contingent upon the recognition of native title. Some Indigenous people have chosen not to make a native title application because of limitations with the native title system. Other Indigenous people may be recognised as traditional owners of country in the community; however, they are unable to successfully meet the legal requirements of native title recognition. Further, it is by no means clear that native title rights 'to water' extend beyond the personal and domestic.

State and territory government progress in implementing the National Water Initiative is reported on in biennial assessments by the National Water Commission. These assessments report that Indigenous cultural values and economic development are not considered by many water plans and that it is often assumed that environmental water will take care of Indigenous values (NWC 2011, p. 12; NWC 2009, p. 121).

In New South Wales there is a regime set up under the *Water Management Act 2000* (NSW), which includes Aboriginal cultural access licences as a category of licences within water-sharing plans. The rules and conditions for the Aboriginal cultural access licences essentially exclude economic purposes and include water used for drinking, food preparation, washing, manufacturing traditional artefacts, watering domestic gardens, cultural teaching, hunting, fishing, gathering and for recreational, cultural and ceremonial purposes. There is a separate scheme for commercial water licences for Indigenous businesses. The first cultural access licence in New South Wales was granted to the Nari Nari Tribal Council in 2004, although problems with the scheme have limited its potential (Jackson et al. 2010, pp. 85–106; ATSISJC 2008, p. 189).

Godden and Gunther argue that the inclusion of Indigenous values in policy and statutory frameworks is not enough to ensure meaningful Indigenous involvement in water management, and that substantive legal recognition is needed (2010, p. 252). For example, they view the scope for the protection of Indigenous cultural heritage under the National Water Initiative and the *Water Act 2007* (Cth) as likely to be limited to environmentally based exemptions such as limiting impacts on ecosystems (2010, p. 248). Substantive legal recognition is also the intention of the Echuca Declaration, which identifies that cultural flows are to be 'legally and beneficially owned' by Indigenous people. Altman argues that the water reform process is an opportunity to recognise Indigenous peoples' property rights in water and provide an economic resource so that Indigenous communities can establish themselves as viable economic entities (Altman 2004, p.29). The *Mabo* native title decision only partially redresses the historical failure to recognise Indigenous peoples' property rights, and arguably other legal and policy initiatives influenced by principles of non-discrimination and equity before the law are needed.[4]

[4] A social justice package was part of the federal government response to native title but it was never delivered (Brennan et al. 2005, p. 105). An Indigenous Land Fund was established to purchase land where native title is difficult or impossible to recognise.

Internationally, there are a number of instruments that convey a right to water by Indigenous peoples, a significant one being the Declaration on the Rights of Indigenous Peoples. This sets a benchmark for states in providing adequate rights for and protection of Indigenous peoples. Water is emerging as a crucial element within the broader context of human rights because water is central to life, self-sufficiency and ecosystem health. Rights enshrined in international agreements can influence the recognition of rights in relation to natural resource management within Australia and provide a consistent approach as well as minimum standards for reporting on rights implementation.

As part of lobbying for cultural flows, Yarkuwa Indigenous Knowledge Centre is actively engaged with international rights forums. In May 2011 Steven Ross attended the United Nations Permanent Forum on Indigenous Issues, where he drafted and delivered the Water Intervention (Appendix 1). A number of recommendations from the intervention were endorsed by the forum and included in the final report. These include:

- the recognition of cultural flows by all states in their legislation and policy
- the right to exploit water resources for cultural and commercial purposes
- the right to full and meaningful participation in water management processes.

Cultural flows and environmental flows

The relationship between cultural flows and environmental flows traverses intercultural contexts, carrying different and similar values and decision-making priorities for water. Environmental flows are focused on supporting ecological life and use ecological criteria such as fish and bird breeding events to determine their success (Hale & SKM 2011). The management of environmental flows is also positioned in water debates as an exercise in improving river health for agricultural production. They are part of ensuring the rivers are healthy enough to deliver water for irrigation (for example, MDBA 2011, p. vii). There is much here in synergy with cultural flows, but there are substantial and critical differences that prevail and demand attention. (For a brief history, Appendix 2 charts the policy dialogue and implementation of environmental flows and cultural flows in the Murray–Darling Basin from the 1970s onwards.)

There is often a conflation of Indigenous peoples' water interests and environmental conservation interests, with some water management plans incorporating Indigenous cultural water within environmental flows (National Water Commission 2009, p. 121; Duff, Delfau & Durette 2010, p. 2; Godden & Gunther 2010, p. 248; Behrendt & Thompson 2004, p. 103). The assumption that Indigenous interests are taken care of if environmental interests are addressed has both positive and negative effects for Indigenous people. It acknowledges the important relationships Indigenous people hold with their country; however, it reduces these relationships to narrow environmental frames and denies Indigenous peoples' agency in water management (for example, Braun 2002).

If Indigenous peoples' values are to be accounted for within environmental objectives such as environmental flows, there is a risk that this water governance can be undertaken without an active role for Indigenous people and their values — that is, the decisions about this water can be made according to ecological priorities. The consequences of such exclusion are particularly important in the over-allocated and degraded Murray–Darling Basin, where environmental water allocations are going to be small, with limited range. As Wahlquist notes, the amounts are only enough to improve river condition from severely degraded to poor (2011, p. 123). There will be winners and losers in who gets to continue to practice and pass on their cultures (Weir 2009, p. 108). MLDRIN has repeatedly raised concerns about this problem. One example they cite is the Murray–Darling Basin Authority's 'The Living Murray' program, which prioritises six 'icon sites': Barmah–Millewa Forest; Gunbower–Koondrook–Perricoota Forest; Hattah Lakes; Chowilla Floodplain and Lindsay–Wallpolla Islands (including Mulcra); the Lower Lakes, Coorong and Murray Mouth; and the River Murray Channel (MDBC 2005). For the Indigenous nations in MLDRIN it is hit-or-miss as to whether they have an icon site in their country. For Wamba Wamba and Perrepa Perrepa, their country includes Gunbower–Koondrook–Perricoota, but the Werai Reserve is left out.

This tough negotiation space is made tougher for Indigenous people by the positioning of economic and ecological objectives as competing goals (Weir 2009, pp. 24–25, 129–134). The Commonwealth buyback of consumptive water allocations to create environmental water allocations is seen by Murray–Darling communities as a threat to individual and community livelihoods (Alston & Whittenbury 2011). The most politically palatable route for Indigenous people to take in this context is to pursue cultural water that matches environmental outcomes rather than raising economic livelihood issues. What is lost in the mix is the cultural flows logic that situates healthy river ecologies as the precursor to sustainable river economies.

Based on their experience from Northern Australia, where rivers are largely in good health, Jackson and Morrison emphasise that sustaining healthy ecologies can meet many important Indigenous water values while also doing away with the fraught task of articulating and quantifying a separate cultural flow (2007, p. 31). They qualify this with the condition that Indigenous management receives the support of government agencies. Jackson and Morrison point out that many Indigenous water uses are non-extractive and do not require a specific allocation of water, that in diminished ecosystems a separate allocation of water is unlikely to make much improvement, and that there may not be sufficient Indigenous interest in abstractly separating water uses and quantifying a cultural water allocation (2007, p. 31). They also argue for greater participation and involvement of Indigenous people, including their aspirations and the role of their institutions, in water management itself (Jackson & Morrison 2007, p. 33).

Indigenous people often identify Indigenous governance as a key distinction between environmental and cultural water. With cultural flows, it is the Indigenous peoples themselves who decide where and when water should be delivered, based on their priorities and goals. This direct governance role ensures that Indigenous peoples are empowered to fulfil responsibilities to care for country (Ross 2009, p. 23). It also reduces the cost of translating their values (see *Translating cultural flows*, this report). With the Commonwealth buyback of consumptive water licences to create environmental water allocations, the potential for Indigenous governance of environmental flows is growing.

It is pertinent that the language of cultural flows developed out of Indigenous peoples' responses to water management in the Murray–Darling Basin, where they have had to develop and test arguments to communicate values that were previously supported by a healthy, flowing river. This includes arguing for the very presence of water itself. The loss of plants, animals and entire landscapes is expressed by the traditional owners as a contemporary experience of dispossession from their culture (Mary Pappin cited in Weir 2009, p. 59; Lee Joachim cited in Weir 2009, p. 61; Henry Atkinson cited in Weir 2009, p. 60; Matthew Rigney cited in Weir 2009, p. 60; see also Hattam, Rigney & Hemming 2007 and Willis, Pearce & Jenkin 2004). They express how culture and water are embedded in each other. Their arguments for holistic cultural flows follow on from this experience, reconnecting water that has become isolated as a discrete resource with the places and histories that it sustains. A discrete cultural water allocation is not enough to restore the river country; thus the larger message of the cultural flow is for all institutions to have greater respect for country. This is also stated clearly in the preamble to the Echuca Declaration, which criticises the federal and state governments for failing to care properly for country.

Cultural water in the Edward/Kolety – Wakool

The current challenge is to take the broad objectives and principles of Indigenous peoples' rights and interests—such as in the cultural flows definition and the clauses and objectives of the National Water Initiative and the Water Act—and translate them into local water allocation plans (O'Donnell 2011, p. 222). This is a challenge for both Indigenous and non-Indigenous organisations. There are many components to this work— identifying objectives and methods, building relationships and capacity, and so on. This section sets out some of that work to date, as well as the governance context in which this work takes place. Yarkuwa have strategically placed their priorities for Werai Reserve within the Edward/Kolety – Wakool system so as to match with the activity around environmental water delivery (as reported in Hale & SKM 2011).

Translating cultural flows

On 17 August 2011, the Yarkuwa board met to consider a definition of cultural flows that met their purposes, including acknowledging the importance of Indigenous peoples' participation in water decision making. The board built on the MLDRIN definition, keeping it as a first component, and added to it with a second component:

1. 'Cultural Flows' are water entitlements that are legally and beneficially owned by the Indigenous Nations of a sufficient and adequate quantity and quality to improve the spiritual, cultural, environmental, social and economic conditions of those Indigenous Nations; and,
2. Cultural flows involve the full and meaningful participation of Indigenous Nations, using free, prior and informed consent processes in all water management, including, but not limited to, environmental flows and cultural water licenses.

At the same meeting, the Yarkuwa board also developed principles for cultural flows, to give greater context to their definition of cultural flows. These principles are:

1. country as the meaningful framework for water
2. Indigenous nations as an essential part of cultural flows
3. recognition of Indigenous ecological knowledge as science
4. capacity building as central to Indigenous nations' full and meaningful participation.

The definition of cultural flows and the principles were presented by Steven Ross to the wider Yarkuwa membership at a meeting on 27 August 2011 and were supported by the members. Both the definition and principles continue with the broader agenda of cultural flows while keeping the priority for a water entitlement. The Yarkuwa board includes environmental flows and cultural water licences under the rubric of cultural flows.

The cultural flow principles and definition reflect a broad environmental–cultural agenda that Yarkuwa has been articulating (Yarkuwa 2009; Yarkuwa 2008) as part of an ongoing strategy to communicate cultural diversity in settled, south-east Australia. At the meeting where they were developed, the Yarkuwa board was concerned about the misunderstandings surrounding cultural flows and the problems with articulating the distinct role of traditional owners of country and why their water issues are so important. David Crew, Manager of Yarkuwa and co-author of this report, has discussed the context in which these issues are raised:

> In more closely settled parts of Australia you've got many different land tenures, and diverse people that have emotional, economic and social connections. Where Indigenous perspectives have been marginalised or dismissed, their assertion can be confrontational (interview with Weir, 7 September 2011).

Traditional owners have distinct relationships with country that are a part of their ongoing identity, and their lives are also now intimately related to non-Indigenous people and enmeshed with the activities of the broader community. The distinct roles and values traditional owners identify with may not be immediately obvious to someone unfamiliar with them—for example, fishing and camping, which have recreational value but are also part of continuing the links of knowledge and family through the generations. Such activities are also an opportunity to 'be' Indigenous, which is often limited in settled Australia (Behrendt & Thompson 2003). Wamba Wamba and Perrepa Perrepa people talk about the importance of opportunities to spend time out at Moonacullah without having to ask permission to access the land (participant contributions, Yarkuwa–CSIRO workshop 8 September 2011). Indigenous people do not each hold all the knowledge of the traditional owner group; different people will have different expertise and interests.

Negotiating and explaining identity issues about difference and similarity with non-Indigenous people can become tiresome; however, Jeanette Crew, co-author of this report, has noticed that things have improved in recent years:

> [Previously] no one thought we should be part of the process. There's been a lot of hard work since then. Even at the [Murray] CMA, people were questioning why they should talk to blackfellas, why we should be involved. Now they can't seem to get enough blackfella involvement. There has been a lot of hard work, and a changeover of staff (Yarkuwa–CSIRO workshop 8 September 2011).

One reason Yarkuwa have been so active in the linking of cultural and environmental issues is the impact of landscape degradation on their cultural activities. Wamba Wamba man Leo Briggs Jnr has talked about how his father used to take him out to Werai and show him burial grounds and important swamps, and how he cannot pass all of this experience on to his kids because some of these places have now gone (interview with Weir, 7 September 2011). Such losses are also felt by non-Indigenous people who have experienced changes to particular places over their lifetime, but for traditional owners they are compounded by being a loss of their culture, laws, language, identity and rights. Leo has described how his inherited knowledge can easily be lost between generations, as it is knowledge not held in books but taught and experienced on country. Sustaining this knowledge through centres such as Yarkuwa is important work.

One of the Yarkuwa board's requests was that this report articulate the potential benefits of cultural flows in forms that fit better with water policy framings. They were concerned that the cultural flows agenda had become narrowed to the point of being just a quantity of water that is in competition with water for agriculture:

> We are continually dismayed by the idea that there should be competition between consumptive users and the environment when we seek to work together to Look after Country — a traditional Aboriginal value that is well recognised — Looking after Country means Country looks after you (Yarkuwa 2012a, p. 3).

Table 2 was developed from Yarkuwa and other documents[5] with this purpose in mind — to bring attention to the broader values of cultural flows. Articulating the benefits of cultural flows in table form highlights these benefits, although it does so by simplifying and reducing a holistic, integrated concept.

[5] Ross 2009, Yarkuwa 2009, Yarkuwa 2008 and Hale & SKM 2011.

Table 2: Cultural flows reduction: anticipated benefits of cultural water in the Edward/Kolety – Wakool

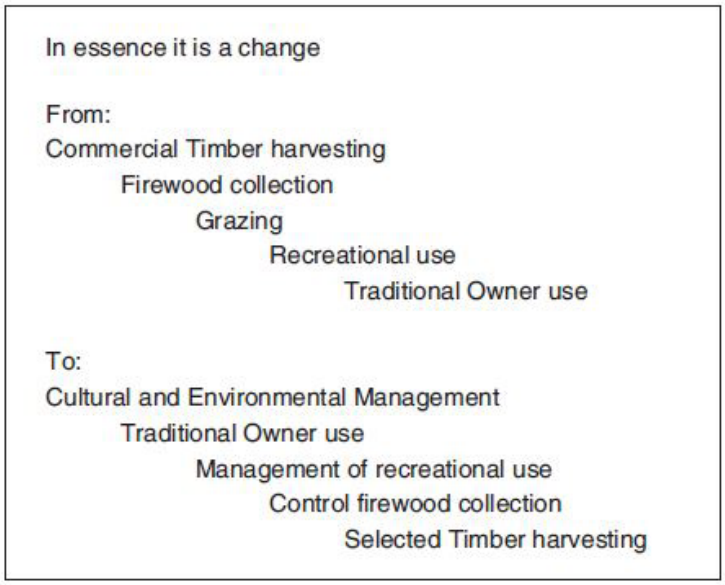
Cultural wellbeing	Environmental wellbeing	Social and economic wellbeing
Investment in traditional owner understandings of creation and existence, including totemic relationships, ancestral relationships and spirituality Care for spiritually and culturally significant places A productive and healthy environment, which will support resources such as food (fish, birds, insects, grubs), medicines (e.g. old man weed), and materials for arts and crafts (e.g. basket weaving) Active involvement in improving the health of country, which will support language, dance, song, arts and crafts, significant trees, sites, beliefs, stories, and ceremonial areas of country	Extend or supplement environmental flows to improve water quality and the connectivity between the rivers, floodplains and wetlands. This will help the habitat and refuge areas for fish, waterbirds, plants and trees. Decisions about the flows will be made to reduce blackwater occurrences and the exposure of acid sulphate soils. This activity will create positive feedback loops for the Edward/Kolety – Wakool by building on and complementing the environmental knowledge held by traditional owners, who have an intergenerational interest and experience in caring for the environmental values here.	Economic opportunities such as the provision of environmental services, educational activities, cultural camps, ecotourism, arts and crafts, water economies and carbon economies Investment in kinship relationships, teaching and learning, supporting children and elders, and family cohesion Greater support for community development, providing employment and training, and building and sustaining Indigenous governance structures and corporate capacity Development of and participation in Indigenous models of economic sustainability (and cultural economy) in restoring landscapes and adapting to climate change. Health benefits from the positive physical and mental health outcomes that are associated with caring for country[1] Empowerment and social justice through the recognition of water rights and the role of traditional owners to look after, care for and speak for country. Meeting principles of equity and respect, which creates a better society for all

Yarkuwa staff and board members have invested considerable energy in engaging with environmental and natural resource management agencies to translate their values into words and diagrams accessible for policy makers. David Crew, co-author of this report, has described the rationale for this:

> We maintain that the health of the environment has a direct connection to the health and wellbeing of our community. Access to resources, including food and medicine, are critical in working to close the gap between Aboriginal and non-Aboriginal communities (NSW Legislative Council 2012).

In a 2009 paper discussing the management of river red gum forests, Yarkuwa recommended that management plans for the Werai Forest change their focus (see Figure 1).

Figure 1: Werai Forest proposed change of management



Source: Yarkuwa 2009, p. 8

This figure shows how two different management approaches would prioritise different values. The first example is a commercial timber harvesting approach and the second is a cultural and environmental management approach. The figure illustrates how Yarkuwa is re-visioning the management of the Werai Forest to include resource extraction but as a lower priority. The diverse values of the forests remain part of the management but are reordered to prioritise the values of most importance to the traditional owners. This model reinstates the traditional owners as central to the future of the forests rather than a marginalised interest group. With the change in the status of the Werai from state forest to an Indigenous Protected Area, it is likely this management change will be achieved. Regarding the selected timber harvesting, now referred to as ecological thinning, such activities can continue on a small scale on conservation lands provided cultural and environmental values are protected. In fact, ecological thinning can be beneficial for red gum forests. Significantly, Figure 1 illustrates more than just an 'under new management' change; it embeds culture and environment as the context for the Werai's management. In doing so, Yarkuwa challenge the separation of nature and culture that has underscored the development of the Western sciences. Their holistic approach is an example of their place-based knowledge tradition of 'country', which focuses on the relationships held between people, plants and animals, culture and environment (Rose 1996).

Yarkuwa have explored many avenues to increase the participation of the Aboriginal community in looking after country, and over the last 10 years have developed partnerships with local land managers and natural resource management agencies. Without a land base, Yarkuwa's work has relied on the ability to negotiate with mainstream organisations. Various grant programs, including the NSW Environmental Trust's 'Protecting Our Places', have provided financial support to assist Yarkuwa to participate in such negotiations on a more equitable footing. Yarkuwa have undertaken multiple cultural–environmental projects; for example, at the Murray Valley Regional Park and the Deniliquin Island Sanctuary. Such projects have many benefits for the traditional owners and the broader community, most demonstrably the generation of work for Yarkuwa members and the support of mainstream agencies in providing public benefits such as environmental habitat. The synergies produced validate the arguments Yarkuwa have made about the role of Aboriginal communities linking with mainstream agencies for effective outcomes, which also requires government investment in building this local capacity. It is also work that is very meaningful for cultural development. The planting of native grasses is providing materials for basket weavers, such as Yarkuwa member Debbie Flower. Debbie held her first solo exhibition in 2012, weaving fibres as her ancestors did and diversifying this through introducing new mediums, as well as creating new figurative work representing local totems. She weaves using raffia, and started weaving during the drought when the best wetlands that used to support the basket weaving grasses were parched of water.

Throughout such activities and partnerships, Yarkuwa have continued to present their connected approaches to country. Jeanette Crew, co-author of this paper and a Mutthi Mutthi Elder, has spoken previously about the difference between a traditional owner approach to the forested wetlands and the current management (Weir 2009, p. 72–73). To counter what she saw as the marginalisation of Indigenous people and their knowledge and roles in natural resource management, Jeanette prepared a poster, 'Indigenous use of natural resources', for a festival for the sustainable use of resources held in the Riverina. This poster is on display at the Yarkuwa office and includes the text:

> The Indigenous people of the Riverine Plain, including *Wamba Wamba*, *Wiradjuri*, *Yorta Yorta*, *Birrapa Birrapa*, *Muthi Muthi*, *Nari Nari* and *Wadi Wadi*, use the natural resources of the region for food, herbs and medicines, shelter, toolmaking and trade. Indigenous people still exploit the natural resources of the Riverine Plain using a number of different technologies. This is done with land management principles in mind to ensure that resources are available for future generations. These land management principles include song, dance and ceremony, not only for the conservation of the environment, but also to ensure its continued health and fertility.

Jeanette adapts natural resource management to a cultural context allowing for contemporary use of country. Indigenous peoples' 'caring for country' is often dismissed as unscientific, spiritual fancy, or both (Weir 2011). At other times, Indigenous values are just included in the project as a 'cultural add-on'. In contrast, natural resource management or water management is often positioned within the assumed cultural neutrally of universal knowledge (see discussion Weir 2009, p.67). This characterisation of Indigenous knowledge as 'cultural' and non-Indigenous knowledge as 'scientific', results in exercises of power when it comes to whose knowledge is valuable (Muller 2012). The importance of addressing this framing of Indigenous and non-Indigenous knowledge was expressed to the authors by the Yarkuwa Board, who placed Indigenous ecological knowledge among their principles for cultural flows. Rose (2007a) identifies that the problem is not so much the privileging of scientific knowledge but how that knowledge is used in environmental management by governments—that is, what you do with the knowledge and why you do it.

Diverse Indigenous governance

The work of Yarkuwa is closely networked with, and operates alongside, that of other incorporated and unincorporated Indigenous governance bodies with interests in or responsibilities for land and water in the Edward/Kolety – Wakool. While Yarkuwa have taken a lead role in lobbying for the IPA and cultural flows, as this advocacy work starts bearing results the opportunities that come will have implications for relationships between the different Indigenous organisations. Ensuring good relationships continue between these diverse governance bodies is central to ensuring that good decisions are made by, for and with the support of the Wamba Wamba and Perrepa Perrepa community. As part of the research project, Yarkuwa asked that we document the diversity of this Indigenous governance.

Yarkuwa Indigenous Knowledge Centre was formed in 2003 by Wamba Wamba and Perrepa Perrepa TAFE students who were keen to develop their knowledge and skills in historical research. The trigger for forming Yarkuwa was a community visit to Canberra to view materials in the AIATSIS archives, including songs and photos. Yarkuwa was formed as a place to hold copies of this material, provide education services, engage in negotiations with government agencies, assist members to develop educational and research skills, facilitate the intergenerational transfer of knowledge, and, more recently, acquire land for purposes of economic and cultural economy, cultural heritage, education and conservation (although Yarkuwa has not acquired any land at the time of writing) (Yarkuwa 2012b).

Yarkuwa provides cultural heritage services and undertakes cultural and environmental work, such as water testing and noxious weed removal. Yarkuwa has programs to support the education of Aboriginal children, to support Aboriginal carers and community workers, and to promote access for the Aboriginal community to community services (Yarkuwa 2011a & 2011b). Some of the other activities and services supported by Yarkuwa include a gallery in their offices, basket weaving, free internet access, photographic and genealogical collections, a newsletter, and flu vaccinations. All active members of Yarkuwa must be direct descendants of Wamba Wamba or Perrepa Perrepa peoples.

The other key incorporated Indigenous organisations in the Edward/Kolety – Wakool are the three Local Aboriginal Land Councils (LALC): Deniliquin LALC, Wamba Wamba LALC (based near Swan Hill) and Moama LALC. The LALCs were established under the *Aboriginal Land Rights Act 1983* (NSW), and there are 119 LALCs in New South Wales. Membership of the land council is based on residency in the land council area. In some areas this has resulted in struggles over authority, especially in areas where traditional owners are a minority. In other areas, such as Deniliquin, there is a majority of traditional owners in the resident Indigenous population (Weir & Ross 2007, p. 196).

The role of the LALCs is to acquire land (either through purchase or claim), to protect and promote Aboriginal cultural heritage and to encourage and assist community businesses (Aboriginal Land Rights Act, s. 52). The land councils also have responsibility for negotiating access agreements with landholders for hunting, fishing or gathering (s. 47). One of the main functions of LALCs has been to provide social housing in towns for their members, but their functions can extend into many other activities. For example, a Joint Indigenous Group was established to monitor the extensive flood enhancement works for the Koondrook–Perricoota Forest, immediately south of the Edward/Kolety – Wakool system. Moama and Deniliquin LALCs were part of this (JIG n.d.), although Deniliquin LALC is no longer involved. The Deniliquin LALC also holds the land title for the Moonacullah Mission, which neighbours Werai Forest.

The relationship between Yarkuwa and the Deniliquin LALC is close. Most members of Yarkuwa are also members of the Land Council and the organisations have similar interests and activities, although their core business differs. Yarkuwa and the Deniliquin LALC regularly communicate on issues of joint concern—for example, the Werai Forest use and occupancy mapping project was conducted jointly with Yarkuwa and the Deniliquin LALC in 2010. The Deniliquin LALC is often a first port of call for government agencies because of its statutory role as a land council, and it will sometimes refer on matters directly relevant to Yarkuwa. Yarkuwa was formed in part to address issues that competed for space on the Deniliquin LALC agenda, which was busy with social housing and economic development concerns. However, Yarkuwa has grown and taken on more diverse roles. In addition to the challenges of being an Indigenous minority within a colonial state, the objectives of these key organisations can be put at risk by lateral violence and other negative influences from the Indigenous community themselves. Lateral violence is a term used to describe the organised, harmed behaviour that is perpetuated within a group who have experienced disadvantage, discrimination and oppression (ATSIJC 2011, p. 52).

Another local Indigenous organisation relevant to this discussion is the Larnangurag Aboriginal Association, which was set up to manage the 681-hectare property Elimdale, on the Old Morago Road west of Deniliquin and on the Colligen Creek, which flows into the Werai Group of Forests. This property was purchased by the Indigenous Land Corporation and granted to the association in October 2000. The Indigenous Land Corporation is a statutory corporation established in 1995 to assist Indigenous people with acquiring and managing land to achieve economic, environmental, social and cultural benefits. The ILC is part of a package of responses to the uneven geographic benefits of native title. It purchases properties where it is difficult or impossible for native title to be recognised. Larnangurag Aboriginal Association is a small organisation, with membership comprised of one Wamba Wamba nuclear family, and its work is focused on managing the property as a farm business. This property is close to Werai, located on the Tumudgery Creek, and includes the site of Aboriginal settlement prior to Moonahcullah.

Other incorporated and unincorporated Indigenous groups that land and water issues in the Edward/Kolety – Wakool are relevant to include:

- the traditional owner groups: the Yorta Yorta, Perrepa Perrepa, Wamba Wamba, Muthi Muthi and Wadi Wadi
- the **Werai Aboriginal Negotiating Team** (WANT), which has been established to oversee the transfer of the Werai from NSW State Forest land to an Indigenous Protected Area. WANT represents Wamba Wamba and Perrepa Perrepa family groups and is working with NSW Office of Environment and Heritage (OEH), which is facilitating the handover process. The land is vested with the Minister for the Environment for transfer to the traditional owners

- the **Murray Aboriginal Technical Group** (MATG), which advises the Murray Catchment Management Authority on technical issues, such as how to include Indigenous values in water plans
- the **Deniliquin Aboriginal Working Party** (DAWP), which is an informal forum for networking, information exchange and forging partnerships between organisations and the Indigenous community (Yarkuwa 2011)
- **Yorta Yorta Nation Aboriginal Corporation** (YYNAC), whose country is immediately upstream of the Edward/Kolety – Wakool and who have a cooperative management agreement with the Victorian Government for Barmah National Park
- the **Wiran Aboriginal Corporation**, which was established as a Wamba Wamba corporation based in Swan Hill, downstream of the Edward/Kolety – Wakool but still in Wamba Wamba country, and which managed the lease for an ILC property, though that lease expired in 2008
- the **Muthi Muthi Nation Aboriginal Corporation**, based in Balranald, further downstream from the Edward/Kolety – Wakool
- an incorporated body for Wadi Wadi, also downstream.

The MATG is a new model for an Indigenous advisory group for the Murray Catchment Management Authority and addresses problems with the previous model. The Murray CMA had been receiving advice from the Murray CMA Aboriginal Advisory Group (MAAG), comprised of one representative each from Deniliquin and Cummeragunga LALCs, and Yorta Yorta, Wamba Wamba and Wiradjuri traditional owner groups (Yarkuwa 2010, p. 10). However, there were inefficiencies in meetings, including meeting size and agenda, and problems with the exchange of information between communities and the Murray CMA board. This led to MAAG conducting a review collaboratively with the Murray CMA board to consider whether they were meeting their original terms of reference. They concluded that the group structure was not effective for the tasks they were responsible for and that a new model of engagement, based on technical expertise, was needed.[6]

MATG is a much smaller group, with a maximum of five members. MATG membership is not representative of traditional owner groups or other organisations, and instead is skills based. Members must work in the interests of the whole diverse Indigenous community, rather than for their specific organisational or personal interest. They meet at least four times a year and can invite specific technical experts to meetings for advice when needed. Applicants to MATG have to meet specific criteria, including Aboriginality, knowledge of cultural heritage, connection to the Murray catchment, and good networks and communication skills. MATG works directly to the CMA board and receives sitting fees and governance training. This smaller and more focused model is designed to be more engaged and more efficient. It will also reduce the exhausting meeting load of key Indigenous leaders.

Another relevant group, but one that has a regional focus, is MLDRIN, which is incorporated and receives funding from the Murray–Darling Basin Authority. The chair of MLDRIN sits on the MDBA Basin Community Committee. Previously, both Yarkuwa and the Deniliquin LALC were involved in selecting one of the Wamba Wamba and Perrepa Perrepa delegates for this alliance (Weir & Ross 2007, p. 196). The other representative came from the Victorian side. Currently both Wamba Wamba representatives on MLDRIN are from the Victorian side.

[6] Co-author Steven Ross was involved in this process at each stage. As MLDRIN Coordinator, he helped establish MAAG. As a board member of the Murray CMA he assisted with the review and in establishing the new model.

Table 3: Indigenous governance bodies with land and water interests of particular relevance to the Edward/Kolety – Wakool rivers.

Name	Key roles	Incorporated
(unable to locate at the time of writing)	Incorporated body for Wadi Wadi	Yes
Deniliquin Aboriginal Working Party (DAWP)	Provides an informal network for organisations and the Indigenous community in Denilquin	No
Deniliquin Local Aboriginal Land Council	Land acquisition, social housing, economic development, cultural heritage	Yes
Joint Indigenous Group (JIG)	Monitors the extensive flood enhancement works for the Koondrook–Perricoota Forest	No
Larnangurag Aboriginal Association	Holds and manages 'Elimdale' property	Yes
Moama Local Aboriginal Land Council	Land acquisition, social housing, economic development, cultural heritage	Yes
Murray Aboriginal Technical Group (MATG) (which replaces MAAG)	Advises the Murray Catchment Management Authority board on policies, programs and projects	No
Murray Lower Darling Rivers Indigenous Nations (MLDRIN)	Promotes Indigenous issues in water management and builds traditional owner capacity to engage in water issues	Yes
Muthi Muthi traditional owners of country	Inherited responsibilities from ancestors and ancestral beings	No
Perrepa Perrepa traditional owners of country	Inherited responsibilities from ancestors and ancestral beings	No
The Muthi Muthi Nation Aboriginal Corporation	Cultural heritage and environmental issues, education, research, community services, land acquisition	Yes
Wadi Wadi traditional owners of country	Inherited responsibilities from ancestors and ancestral beings	No
Wamba Wamba Local Aboriginal Land Council	Land acquisition, social housing, economic development, cultural heritage	Yes
Wamba Wamba traditional owners of country	Inherited responsibilities from ancestors and ancestral beings	No
Werai Aboriginal Negotiating Team (WANT)	Oversee the transfer of Werai Forest to an Indigenous Protected Area	No
Wiran Aboriginal Corporation	Advance Wamba Wamba rights, promote agreements, build assets, strengthen customs and traditions	Yes
Yarkuwa Indigenous Knowledge Centre Aboriginal Corporation	Cultural heritage and environmental issues, education, research, community services, land acquisition	Yes
Yorta Yorta Nation Aboriginal Corporation	Cooperative management of Barmah National Park and other areas, cultural heritage	Yes
Yorta Yorta traditional owners of country	Inherited responsibilities from ancestors and ancestral beings	No

The governance of cultural water for the Edward/Kolety – Wakool will necessarily involve this diverse group of Indigenous peoples' governing bodies. The different organisational roles and responsibilities will always be complex and can lead to conflicts and misunderstandings, as well as the problem of lateral violence. If an existing governance body does not fit the role or meet community expectations for what is required for the governance of cultural flows, a new governance body may need to be formed. If a new organisation is required, membership of this new body will have to consider whether its priority is to be representative or skills based. Resourcing and capacity building is central to the success of such a body, as discussed later in this paper.

Watering the Edward/Kolety – Wakool

> Water has always been a big issue. It's nature. If it floods, if this ground is meant to flood, let it flood, because we've just come off ten years of drought…it's only a matter of knocking so much out of a levy wall to let it run in.
> —Leo Briggs Jnr (interview with Weir, 7 September 2011)

The New South Wales state government is responsible for allocating water to users, which it does through water-sharing plans under the Water Management Act. These plans allocate water between all water users, improve river health, facilitate water trading and support regional communities. A draft water-sharing plan is prepared by an interagency panel comprised of the OEH, the NSW Office of Water (NOW) and the NSW Department of Primary Industries. After community consultation the plan is reviewed and approved by the Minister for Primary Industries and the Minister for the Environment. Catchment management authorities have observer status on the panels, provide expertise on local issues and assist with community consultation (NOW 2012). The implementation of these plans interacts with the operational rules of the weirs and regulators (in the Murray Catchment this is the MDBA, Goulburn–Murray Water and the NOW), water trading and allocation regulations (SEWPaC), and accreditation and licensing issues with using irrigation channels and escapes (Murray Irrigation Limited and NOW). In addition, the Draft Murray–Darling Basin Plan under the Water Act proposes another planning process to limit water allocations to diversions that are sustainable.

The Edward/Kolety – Wakool is included in two watering plans. The main one is the Water Sharing Plan for the New South Wales Murray and Lower Darling Regulated Rivers Water Sources 2003, which commenced on 1 July 2004 and is in place for 10 years. The other water plan of relevance is in draft form and concerns adaptive environmental water for the Murray—adaptive environmental water being water that is recovered for environmental use and held by the Minister for the Environment and others (Hale & SKM 2011, pp. 47).

The Hale and SKM (2011) report on environmental water delivery for the Edward/Kolety – Wakool recommends pulse flows in winter, spring and summer to increase flood peaks and extend the duration of floods, depending on the seasonal conditions at the time (pp. 22–23). Pulse flows are likely to have the best effect for triggering food production, fish movement and breeding (Hale & SKM 2011, p. 15); however, there can be adverse effects. There are additional water flow requirements needed to reduce blackwater events. For example, the water delivery regime needs to inundate channels and benches during cooler weather, avoid very low flows during peak leaf litter fall in summer, and use operational flows to dilute water returning from floodplains. Also, moderate flows in spring and summer are needed to stop stratification in shallow pools, and operational flows are needed to prevent the drying and exposure of acid sulphate soils (Hale & SKM 2011, p. 15). The report's authors acknowledge that there are substantial gaps in the knowledge needed for this environmental water delivery and that more research and monitoring is required (Hale & SKM 2011, p. 15).

This environmental watering has to be coordinated with priorities for irrigation water. The Edward/Kolety – Wakool river networks are interlaced with the Murray Irrigation Limited irrigation area, where water is supplied for irrigated crops from August to May (Hale & SKM 2011, p. 6). Decision making about environmental flows is linked to the established practices for irrigation water, with decisions being made in July at the start of the 'irrigation season'. Both depend on weather conditions, in particular rainfall (Hale & SKM 2011, p. 27). Likewise, the governance of any cultural water allocation will need to be responsive to irrigation water, environmental water and the rain.

The Hale & SKM (2011, p. 44) identify the 'major strategic partners in delivering water' in the Edward/Kolety – Wakool as:

- the NSW Office of Environment and Heritage, as the manager of adaptive environmental water in the Water Sharing Plan for the New South Wales Murray and Lower Darling Regulated Rivers Water Sources
- the MDBA, as the operator of the Murray system releases from Hume Dam
- the Commonwealth Department of Sustainability, Environment, Water, Populations and Communities (SEWPaC), as responsible for development and implementation of national policy, programs and legislation to protect and conserve Australia's environment and heritage
- The Commonwealth Environmental Water Holder (CEWH), as responsible for the management of water entitlements that the federal government acquires to be used to protect or restore environmental assets
- Murray Irrigation Limited and the NSW State Water Corporation, as operators of the Murray Irrigation channels and escapes
- NSW State Water Corporation and NSW National Parks and Wildlife Service, as operators of the flow regulators into and out of Werai Forest
- the Murray Catchment Management Authority, as a stakeholder in the development and implementation of watering plans
- the Victorian Department of Sustainability and Environment and the OEH, as holders of water for the Barmah–Millewa accounts
- the NSW Office of Water.

The Hale and SKM report does not mention the traditional owners, nor address Indigenous values or governance roles, but it does briefly note that the Werai Forest is a proposed Indigenous Protected Area (2011, p. 4). Because of their diverse partnerships and roles, Wamba Wamba and Perrepa Perrepa are implicitly present in Hale and SKM's list of strategic partners through:

- the Murray CMA's Aboriginal Technical Group (MATG)
- the MDBA's engagement with MLDRIN
- the NSW OEH relationship with the WANT to transfer Werai.

Steven Ross was the Indigenous portfolio board member for the Murray CMA at the time of the Hale and SKM report, although he no longer holds that position.

There is also broader Indigenous representation among the strategic partners through the MLDRIN chair's membership of the MDBA Basin Community Committee and its Indigenous Water Subcommittee. Another site for Indigenous representation is SEWPaC's Indigenous Advisory Committee (there are currently no Wamba Wamba, Perrepa Perrepa or MLDRIN members). The value of this involvement on various representative boards and advisory groups depends on the power of the particular board. Clearly much more engagement is needed than this, and the CEWH has expressed its desire to understand how Indigenous values relate to environmental water delivery and how they might be better included.[7]

Another group mentioned by Hale and SKM (2011) but not included in the 'strategic partners' list is the Murray Lower Darling Environmental Water Advisory Group (MLD EWAG). This is a non-statutory New South Wales body representing different groups and community members. It provides advice to the OEH on sites for watering, watering options under different weather scenarios, monitoring activities and community values and issues. Its advice and decisions are developed into annual watering plans. The CEWH has observer status on this EWAG but it also is supportive as a partnership for delivery of water from either state or Commonwealth sources.

[7] This was expressed to a meeting of the Murray CMA, on 10 August 2011 in Deniliquin, which co-author Steven Ross attended.

There are also numerous non-Indigenous governance bodies and alliances that are not mentioned in the report. They include the Wakool River Association, a group of irrigators who formed out of concerns about the availability of water from the Wakool River, both for consumption and for the environment; the Murray Valley Water Diverters Advisory Association; and the Wakool Landholders Association. Further, environmental groups such as the Australian Conservation Foundation, Friends of the Earth and the National Parks Association of NSW have played a strategic role in the transfer of the state forests to reserved lands.

In negotiating and lobbying for cultural flows in the Edward/Kolety – Wakool, Yarkuwa are engaged with the New South Wales Government and its water planning, as well as with the CEWH, the Murray CMA, and the MDBA and its planning process. Yarkuwa are very interested in environmental water, in part because the over-allocation of river water and river regulation has effected substantial environmental change on their country. Further, the current wet conditions, and activity around purchasing and prioritising of water for environmental purposes, make these negotiations seem more possible, although wet years also reduce the impetus for water reform. Yarkuwa are keen to highlight Indigenous values that can be met with environmental water, including the role of Indigenous people in the governance of environmental flows, which could be called a cultural flow but would not replace the broader cultural flow agenda. As already discussed, the broad meaning of cultural flows does not fit within regulatory frameworks, and multiple measures are required to address Indigenous water issues.

Within the Water Sharing Plan for the New South Wales Murray and Lower Darling Regulated Rivers Water Sources, there is provision for regulated river (high security) (Aboriginal cultural) access licences of up to 10 ML/yr per application (clause 29(f)). But as yet there has been no cultural access licence issued under the water plan. For the first five years of the plan, the target was to collect information on the Indigenous values for each water source (clause 12(h)). One of the challenges for Yarkuwa is that they do not own any land, although access and partnership arrangements with other landholders is an avenue. For example, a cultural access licence could be applied for by the Deniliquin LALC to water Moonacullah. Jackson and co-authors identify other factors limiting the Indigenous access to cultural access licences. These are: the need for infrastructure to water features and places of importance; the cost of water, administration and delivery costs and effort; and a lack of awareness of the cultural access licences among the Indigenous community (Jackson et al. 2010, p. 99).

The experiences of the Nari Nari Tribal Council illustrate some of the capacity issues around cultural water. Jackson, Moggridge and Robinson have reported on the experiences of Nari Nari people, whose country is in the Murrumbidgee catchment in New South Wales, north of the Edward/Kolety – Wakool (2010, pp. 85–106). Nari Nari have a cultural access licence, under the Water Management Act, for use on their 5000-hectare Indigenous Protected Area on Toogimbie Station. Part of Toogimbie, outside of the IPA, is leased to a farmer and provides a valuable source of income (Jackson et al. 2010, pp. 92–93). Nari Nari have both a cultural access licence and irrigation licences, which are both regarded as consumptive uses because the flow passes into a wetland or farmed area and cannot be diverted further on (Jackson et al. 2010, p. 96). Critically, Toogimbie has existing water infrastructure, including a pump and channel system, to help deliver the cultural water (Jackson et al. 2010, p. 98). However, Nari Nari were unaware of the high costs associated with water and its delivery (approximately $9000 per annum), the pumping site fee, the requirement for a licence for levees, and other administration costs and burdens (Jackson et al. 2010, p. 99). These costs have restricted their use of their cultural access licence. The New South Wales Government is now lobbying to have cultural access licences exempted from some of these water costs, in line with environmental water (Harriss 2012). There are additional costs involved in documenting and monitoring the use of this cultural water as part of demonstrating the ongoing value of this activity (Jackson et al. 2010, p. 101). It is likely that similar issues would be raised for cultural flows in the Edward/Kolety – Wakool, revealing the importance of partnerships in overcoming problems encountered with the logistical, financial, regulatory and other aspects of cultural licences.

There is also a lack of capacity among Indigenous and non-Indigenous water managers to start addressing these issues. With the over-allocation of river water, water management has changed from an engineering project to a complex balancing of diversely held interests, including the ecology. Jeanette

Crew, co-author of this paper, is already concerned about local capacity to manage the IPA and wants an assessment of what is there now and what needs doing to be part of the five-year transfer process (Yarkuwa workshop, 8 September 2011).

Capacity is challenged by the need to keep up with the rapidly evolving environmental water reform agenda. Many aspects of the management of adaptive environmental water are yet to be determined. The terms of reference for the CEWH have very strict criteria for an environmental flow. A flow to flush out leaf litter to reduce blackwater might not meet those criteria. It is also unclear who will become the managers of environmental water and how this will affect existing Indigenous governance institutions—for example, if CMAs are to become the water managers of environmental water then MATG could be an important group for facilitating cultural flows through the use of environmental water.

At their August 2011 meeting, Yarkuwa board members discussed how their capacity was challenged by getting access to the knowledge held about the water system in institutions, such as government agencies, and how that knowledge is not readily available for community education. The development of a TAFE course was suggested as one route to building Indigenous capacity in understanding water management, flood regimes and hydrology. This knowledge and other training are also needed for Indigenous peoples' management of cultural flows. Jackson and co-authors point out that investing in Indigenous capacity to manage environmental water, and to contribute knowledge to water management more generally, will greatly enhance the benefits achieved from increasing Indigenous peoples' access to a water allocation (Jackson et al. 2010, p. 10).

Conclusion

Prevalent features of both the Indigenous and non-Indigenous governance of water are the multiple layers, tenures, management systems, and shared and competing priorities. Water itself overlaps, whether irrigation water, environmental flow or cultural flow. Delivering cultural flows in this interconnecting and multilayered governance context will require innovation, practice and revision. In any case, whether Indigenous or non-Indigenous water rights and entitlements, or consumptive, cultural or environmental water, all rely on the continuing health of the rivers and creeks. The connection between healthy river ecologies and our river industries is a powerful part of the message of cultural flows that needs to travel further into mainstream water governance, to engender broader support in the environmental reform agenda. That this is a contested space is evident in the strategic approach taken by Yarkuwa, as well as in the challenges that are placed before them.

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Appendix 1: Water intervention

United Nations Permanent Forum on Indigenous Issues
Tenth Session – New York
16-27 May 2011

Agenda Item 7: Water

Joint Intervention Delivered by Steven Ross on behalf of:

Aboriginal Legal Service of Western Australia

Aboriginal Medical Service Western Sydney (AMSWS)

Amnesty International, Australia

Gugu Badhun Ltd

National Aboriginal and Islander Community Controlled Health Organisations

National Native Title Council

Office of the Aboriginal and Torres Strait Islander Social Justice Commissioner

Victorian Aboriginal Legal Service

Yarkuwa Indigenous Knowledge Centre

Thank you Madam Chair

Since the colonialisation of Australia water has been quantified, mismanaged, polluted, stolen and of most concern, commodified. Currently in Australia Indigenous peoples are locked out of water discussions, emerging water markets and decision making on the management of commercial and environmental water flows.

In the undammed and unregulated rivers of Northern Australia, governments and corporations are proposing major developments, land acquisition, population growth and irrigation works. All of this is done without the free, prior and informed consent of traditional owners.

Australia is the world's driest continent and has the most variable climate in the world. The current and future threat of climate change will severely compound this variability and means low inflows into major river systems. For example, the Murray Darling Basin is a large geographical area that currently supports some 2 million people including 15% of Australia's Indigenous population and provides 40% of Australia's food and fibre. In 2006 the Basin

experienced the lowest inflows in recorded history, which was 80% drier than the previous record.

Water has sentience and has a right to be recognised as an ecological entity. Indigenous peoples as holders of the knowledge of water sources and of the songlines and stories related to water, have a right to decide its use, fully participate in management, hold water licenses, trade and use water for cultural and economic purposes.

In many parts of Australia rural and remote communities do not have access to adequate potable water, causing and compounding disparate social health indicators such as health.

Australia's provincial governments struggle to put in place practical policies and regulations that will satisfy residential, industrial and agricultural consumers, whilst at the same time ensuring sustainable water resources for our future.

The cultural rights of Indigenous peoples to water are therefore disadvantaged due to the lack of effective processes to fully recognise and incorporate those rights due to the pressures of competing interests. With the increasing commodification of water the space for Indigenous peoples within the management of water is severely limited.

Australian Governments are placing a high price on our vast mineral resources but are not putting a similar price on one of our greatest and most precious of resources – water.

Rectifying this situation would provide significant opportunities in the water market for Indigenous communities to trade in water, in particular through negotiation with the extractive industry that needs access to water for mine production. The extractive industry should enter into free, prior and informed consent negotiations with Indigenous communities for water extraction and we should be able to negotiate payments for water that is taken from our traditional lands.

This economic imperative also includes the right to fish and extract other resources from fresh and sea water to use for cultural and commercial purposes.

At present the extractive industry has very little accountability neither to the wider community nor to Indigenous peoples in gaining access to water for mining and other activities. Most disturbing the environment safeguards are wanting in Australia, evidenced by the common currently legal practice of insitu leeching, which is outlawed in the United States of America and other Nations.

Furthermore the right of Indigenous peoples to water for cultural purposes must be recognised. Cultural flows as we call them can provide both a beneficial ecological and

human outcome and provide the justice we deserve as a result of the dispossession of our traditional land and waters.

Recommendations

That the Permanent Forum:

1. urges all States to ensure Indigenous People's cultural rights to water are recognised and protected; and
2. urges all States to recognise that water has its own rights as an ecological and sentient entity;
3. urges all States through legislation and policy to support the right of Indigenous peoples to hunt and gather resources from waters including fish, to be used for cultural and economic purposes including commercial purposes;
4. urges all States to fully include Indigenous peoples in decision making processes around water management including commercial, irrigation and environmental water management;
5. urges all States to incorporate the principles of the UN Declaration on the Rights of Indigenous Peoples in all policies relating to Indigenous cultural rights to water and that all water legislation and policy is consistent with Article 25

Appendix 2: Environmental and cultural flows time line

Timeline	Environmental flows	Cultural flows
Pre-1970	**Not considered**	**Not considered**
1970s	**On 'radar'**	
1980s	Increasing awareness of water quality and salinity problems; Murray–Darling Basin Ministerial Council and Commission established; Community Advisory Council created	
1990	**Learning**	
1991	MDBC natural resource management strategy	
1992	Barmah–Millewa Forest Management Plan / Agreement—creation of the Barmah–Millewa environmental reserve report on water use in the Murray–Darling Basin	
1993		
1994		**On 'radar'**
1995		Lake Victoria cultural heritage protection—investigation and works by Barkindji Elders Committee and Lake Victoria Advisory Committee
1996		
1997	**Strategy Development**	MLDRIN M drafted
1998	Cap on diversions	
1999	Salinity audit	
2000	Integrated catchment management policy statement	**Learning**
2001	**Action (projects)**	Scoping study on Indigenous involvement in NRM
	Environmental flows expert reference panel report	Indigenous employees
	Murray Mouth dredging	
2002	MDBMC First Step Decision on The Living Murray	**Strategy Development**
2003	River red gum health survey and trial flooding	MOU signed between MLDRIN and NSW Dept of Land and Water Conservation
2004	**On-ground outcomes (results)**	Indigenous Action Plan developed
2005	Riparian response and bird breeding events	TLM Indigenous Partnerships Project developed
	Flooding through weir raising	
2006	Monitoring and improvement	MLDRIN MOU signed by MDBC
2007–08	*Water Act 2007*, which prioritises environmental flows above irrigation allocations. No mention of cultural flows despite lobbying from MLDRIN. Major parties reject inclusion of cultural flows.	**Action (projects)**—Cultural mapping
		Strategy and cevelopment
		MLDRIN definition of cultural flows in the 'Echuca Declaration'

Timeline	Environmental flows	Cultural flows
2008–2009	Delivery of environmental flows Delivery of Environmental Flows into Barmah Forest. Establishment of Commonwealth Environmental Water Holder Senate review of parts of the *Water Act 2007* Establishment of Edward/Wakool Environmental Watering Advisory Group and other community based environmental water advisory groups Major parties again reject inclusion of cultural flows	NAILSMA endorsed MLDRIN cultural flows definition and includes 'healthy livelihoods' in their definition. National Indigenous Water Forum held in Adelaide. Service agreement between MLDRIN and Murray–Darling Basin Authority, which mentions further research into cultural flows
2009–2010	Delivery of environmental flows into Hattah Lakes, including environmental water delivered by non-government organisation Australian Conservation Foundation Development of Murray–Darling Basin Plan, which will illustrate the volume and operation of environmental flows	Establishment of Northern Basin Aboriginal Nations Establishment of First Peoples Water Engagement Council
2010–2011	Broader strategy and development and delivery Delivery of environmental flows into Werai Forest Release of the Guide Murray–Darling Basin Plan Murray–Darling Basin Plan to be released in second half of 2011	Broader strategy and development and research Cultural flows alluded to in the Guide to the Murray–Darling Basin Plan Cultural flows raised at United Nations Permanent Forum on Indigenous Issues and accepted into final report Research into the science and delivery of cultural flows approved by the Murray–Darling Basin Authority

Source: adapted and updated from Neil Ward, The Living Murray Indigenous Partnership Project, 20

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YARKUWA
INDIGENOUS KNOWLEDGE CENTRE
ABORIGINAL CORPORATION

AIATSIS
AUSTRALIAN INSTITUTE OF ABORIGINAL AND TORRES STRAIT ISLANDER STUDIES
NATIVE TITLE RESEARCH UNIT

The status of Aboriginal water holdings in the Murray-Darling Basin

The status of Aboriginal water holdings in the Murray-Darling Basin

ARI Report No. 2020/004

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November 2020

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Acronyms and abbreviations

ACT	Australian Capital Territory
ALRA	*Aboriginal Land Rights Act 1983* (NSW)
BDL	Baseline Diversion Limit
BR	Basic Rights
DELWP	[Victorian] Department of Environment, Land, Water and Planning
DEW	[SA] Department for Environment and Water
DNRME	[Queensland] Department of Natural Resources, Mines and Energy
DPIE	[NSW] Department of Planning, Industry and Environment
D&S	Domestic & Stock [NSW water entitlement]
ERP	Estimated Resident Population
GL	Gigalitre
GS	General Security [NSW water entitlement]
HS	High Security [NSW water entitlement]
ILC	[former] Indigenous Land Corporation
ILSC	Indigenous Land & Sea Corporation
LLS	Local Land Services [NSW Government agency]
LTDLE	Long-term diversion limit equivalence
MDB	Murray-Darling Basin
MDBA	Murray-Darling Basin Authority
ML	Megalitre
MLDRIN	Murray Lower Darling Rivers Indigenous Nations
NBAN	Northern Basin Aboriginal Nations
NSW	New South Wales
NTA	*Native Title Act 1993* (Cth)
NWI	National Water Initiative
SA	South Australia
SDL	Sustainable Diversion Limit
UR	Unregulated [NSW water entitlement]
VWAP	Volume-weighted average price
WAE	Water access entitlement
WRP	Water Resource Plan

First Nations' Acknowledgement

We, the First Nations of the Murray-Darling Basin, represented by MLDRIN and NBAN, recognise and acknowledge the considerable work and determination of our people to pursue water justice in the Murray-Darling Basin over many generations. We have never ceded Country or waters. Our voices have never been heard or listened to. Dispossession of our cultural rights to water is ongoing and its consequences continue to be felt by our people, including disconnection from our waterways. Our people continue to suffer.

Our people face water access injustices across the Basin. This report measures the inequality of water holdings in a way that reveals the true extent of this injustice to policy makers and governments. The overall message of this report is that the current share of water held by First Nations and Traditional Owner organisations is inequitable, appalling, and unacceptable. This report makes recommendations for improving this unfair situation.

To describe the current situation, the authors had to rely on water management tools and the language used by the MDBA and other government water agencies. Water governance in the Murray-Darling Basin reflects ways of managing water that are harmful to our people. This approach stresses the economic role of water and while that is important, water plays other roles, such as sustaining Country, kin, family, and other relations.

While we recognise the value of the research in this report for our ongoing fight for water justice, we also make the following important statements to assert our cultural knowledge and beliefs relating to water and in doing so, protect our Nations' cultural values. These statements have been written by representatives from MLDRIN and NBAN and are designed to inform all readers:

Responsibility for water: Only those with authority recognised by their Nation have decision-making responsibilities for their traditional Country. We recognise Traditional Owner clans and family groups and their rights to protect their traditional livelihoods and people. These rights are the same as those arising from sacred authority. Only Traditional Owners of the local area have the cultural and sacred authority to speak for Country. Clarity about authority is essential to decision making, including in response to recommendations such as those in this report, and if achieved will result in community harmony.

Ownership: So that governments can measure inequality in water entitlements, the researchers had to use the same measures that governments use to manage water. Therefore, this report accounts for water ownership, including among First Nations and Traditional Owner organisations, from a non-Indigenous perspective. That is, it looks only at existing permits to use water (called "entitlements") that are issued and authorised under government frameworks. These water entitlements often have a financial value on the water market and are considered assets. We recognise, though, that our people maintain inherent rights to water, and that these rights stress obligation, ownership and care. We see our water ownership as a *responsibility* to manage water around our Country to maintain our social, cultural, spiritual, and economic wellbeing.

Presentation of surface water and groundwater: The report also describes water in ways that are not how water exists in the land. Australian governments manage and measure surface waters (e.g. rivers and creeks) and groundwater (e.g. aquifers) through different and separate entitlement frameworks. This disconnection is not how water is; all waters are inseparable. Our rivers, creeks, aquifers, water holes, springs, and lakes are all part of one cultural and physical landscape in which our Lores/laws are embedded. Water managers need to acknowledge, respect, recognise, and respond to our connections and responsibilities to manage Country.

Overall, the language in this report is technical in nature because it is intended to inform government agency water managers and decision makers. The language used in this report does not in any way discount the languages used by First Nations people. A First Nations summary of the report will soon be available for First Nations, and their water managers and decision makers.

Water entitlements do not yet reflect the findings of recent National Cultural Flows research. Australian water legislation recognises our rights, but how this is translated on the ground is still evolving.

Our Country, our waterways, and our people are sick. This is because of the state of our waterways and the lack of respect for our water rights. Although it does not make the connections to health or well-being, this report very clearly shows the inequity and disparity in water holdings within the Basin. This is a national disgrace. The Murray-Darling Basin provides $24 billion to the country's economy every year in agriculture alone, yet our people remain without water and generally live in a state of disadvantage.

We recognise the efforts of Griffith University's Australian Rivers Institute and the MDBA to carry out this research and we recommend this report to you. We do not want this research to sit on a shelf and achieve nothing. There is an expectation that changes will happen from recognising the decades of First Nations' advocacy. MLDRIN and NBAN will use this report to pressure government to be accountable and to make the necessary changes to redress the inequities it reveals.

Executive summary & key findings

Background

1. The most recent Indigenous population statistics for State portions of the Murray-Darling Basin (MDB) cited in most publications use 2001 Census data, making these estimates now close to 20 years old.
2. Evidence from a number of sources shows that much has changed in the Basin over the past 20 years and that more precise data about the Indigenous population and Aboriginal water holdings is required to understand and respond to these changes.

Key findings: Indigenous population

3. In 2016, the Indigenous Estimated Resident Population (ERP) in the MDB was 120,487, representing 5.3% of the total MDB population (2,252,123 persons).
4. Over half (53.7%) of the MDB Indigenous population live within the Northern Basin (64,739 Indigenous persons). In this region, Indigenous peoples also constitute 10.5% of the total population. By contrast, 46.3% of the total MDB Indigenous population live in the Southern Basin (55,748 Indigenous persons). Here, Indigenous people constitute a 3.4% share of the total population.
5. The 2016 MDB Indigenous population constitutes a 15.1% share of the total national Indigenous population (798,333 Indigenous persons). By comparison, the total MDB population (2,252,123 persons) constitutes 9.0% of the total national population.
6. From 2001 to 2016, the Indigenous population in the MDB increased by an estimated 43%, or 2.8% per annum. This rate of growth is more than five times the non-Indigenous population rate, which was estimated to be 8.0%, or 0.5% per annum over the same period. The Indigenous share of the total MDB population has increased from 3.4% in 2001 (Taylor & Biddle, 2004) to 5.3% in 2016, and this share is likely to continue to grow into the future.
7. The largest proportion of the Basin's Indigenous population resides in New South Wales (NSW) (65.1%), where Indigenous peoples constitute a 9.3% share of the total population.
8. More than half (54.5%) of the MDB's Indigenous population live in four Sustainable Diversion Limit (SDL) resource units, three of which are located in NSW. The Macquarie-Castlereagh SDL resource unit had the largest Indigenous ERP in 2016, with 25,524 Indigenous persons representing 21.2% of all Indigenous persons in the MDB.
9. The three SDL resource units with the highest Indigenous population as a proportion of the total population were Intersecting Streams (27.7%), Warrego (19.4%), and Gwydir (16.2%).

Key findings: Aboriginal surface water holdings

10. Across the MDB, at least 30 Aboriginal entities hold at least 12.774 GL/y under 64 entitlements.
11. Aboriginal water holdings constitute a mere 0.17% of the relevant Basin States (excluding Victoria) or 0.12% of the equivalent take Baseline Diversion Limit (BDL) of the whole Basin (including Victoria).
12. The largest volume of water held by Aboriginal entities in the MDB is located in the NSW portion (93.9%). No Aboriginal water holdings were identified in Queensland or the Australian Capital Territory (ACT).
13. Indigenous peoples represent 6.5% of the total MDB population (excluding Victoria) but by comparison, Aboriginal entities hold a mere 0.17% of the available surface water in this area.

14. Aboriginal entities in the north of the Basin hold a smaller fraction of available water (0.11%, compared to 0.21% in the south).
15. Across the Basin, historic land transfers facilitated by the Indigenous Land and Sea Corporation (ILSC) were found to be a key means by which Aboriginal entities acquired water rights (these were attached to land purchased by the ILSC).
16. The land and water transfers to Aboriginal entities that occurred via measures under the *Aboriginal Land Rights Act 1983* (NSW) are unique to that State, and are likely to have contributed to the comparatively greater volume of water held by Aboriginal entities in this region. Aboriginal entities in NSW hold 11.992 GL/y, which equates to 0.21% of the NSW BDL.
17. For the South Australian portion of the MDB, Indigenous persons make up a 3.3% share of the 2016 ERP, while Aboriginal entities hold 0.11% of all long-term diversion limit equivalence (LTDLE) water.
18. In the Queensland portion of the MDB, Indigenous persons represent a 6.0% share of the total population, but Aboriginal entities hold no water use entitlements.
19. In the ACT, Aboriginal entities hold no water use entitlements, despite an Indigenous population of almost 7,500, constituting a 1.9% share of the total ACT population.
20. The LTDLE volume of Aboriginal-held water in the Victorian portion of the MDB could not be determined but, like other jurisdictions, it is expected to be extremely small.
21. Ten of the 11 SDL resource units in which Aboriginal entities hold water are in NSW. The largest Aboriginal-held volume is within the NSW Murray SDL resource unit (4.225 GL/y), closely followed by the Murrumbidgee SDL resource unit (3.954 GL/y). These Aboriginal holdings constitute 0.25% and 0.19% of all water available in the respective SDL resource unit.
22. The SDL Resources Unit where the portion of water held by Aboriginal organisations is largest is the Lower Darling (1.64% or 0.902 GL/y) and the smallest is the Gwydir (0.01% or 0.031 GL/y).
23. Aboriginal entitles hold, and therefore access, water through a combination of regulated (79%) and unregulated (20%) water entitlements across the Northern Basin (21%) and Southern Basin (79%).
24. Aboriginal entities hold disproportionately more water under unregulated entitlements not only across the whole Basin, but also particularly in the Northern Basin. This can be a less reliable means of accessing water.
25. The majority (87.3%) of LTDLE Aboriginal-held water under regulated entitlements is of lower security or reliability. In other words, only a small number of Aboriginal organisations benefit from comparatively greater reliability and certainty of water access; the vast majority receive little such benefit. Further, much of the water that can be accessed through the more reliable entitlements can only be used for domestic and stock purposes.
26. Aboriginal-held water entitlements in SA are more reliable than most other Aboriginal-held entitlements in the Basin.
27. Aboriginal water holdings in the MDB are valued at approximately $18.4 million in 2015-16 water market terms. These holdings constitute just 0.11% of the MDB's $16.5 billion water market (in 2015-16 terms). Aboriginal-held water entitlements in the Southern Basin are valued at approximately $15.3 million. Aboriginal-held entitlements located in the Northern Basin are valued at approximately $3.1 million. Across the Basin, Aboriginal-held unregulated water entitlements are valued at approximately $1.8 million.

28. The Australian Government's $40 million commitment to purchase water for Aboriginal people for economic and cultural purposes equates to just 0.2% of the MDB's water market (in 2015-16 terms).

Key findings: Aboriginal groundwater holdings

29. A novel method was developed for comparing groundwater entitlements across groundwater SDL resource units. The methodology determining available surface water cannot be applied to groundwater.
30. Aboriginal organisations hold 0.556 GL of groundwater entitlements, which equates to 0.022% of the available groundwater resource across the whole Basin.
31. A total of six Aboriginal-held groundwater entitlements were identified, all of which are located within NSW.
32. Aboriginal-held groundwater entitlements are valued at approximately $772,800 (in 2015-16 terms).

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1. Introduction and purpose

This report presents the findings of a data benchmarking exercise commissioned by the Murray-Darling Basin Authority (MDBA). The report intends to improve understanding of current Aboriginal surface water and groundwater access and basic demographic data across current water management units in the Murray-Darling Basin (MDB).

The MDBA commissioned this work following similar research that the lead author completed as part of her PhD at Griffith University (Hartwig, 2020). That work examined Aboriginal water entitlements for only the NSW portion of the MDB (see also Hartwig, Jackson & Osborne, 2020).

The specific tasks of this project were to:

- Update (2016) Aboriginal population statistics for all regions across the Basin, based on Surface Water Sustainable Diversion Limit (SDL) resource units;
- Establish a Basin-wide 2020 Aboriginal water holdings baseline/s that is compatible with Basin Plan water accounting methods;
- Where possible, document changes to Aboriginal water holdings over the last 10 years;
- Identify features of entitlement and licencing systems and recordkeeping that limit future monitoring of Aboriginal water holdings; and,
- Develop recommendations for the MDBA and the Basin States and Territories to improve monitoring of water access for Aboriginal peoples and inform future research.

The information contained in this report will be useful to policy-makers and officials from the MDBA, the Indigenous Land & Sea Corporation (ILSC), New South Wales Aboriginal Land Council (NSWALC), and various state and federal government agencies. It will also be of use to Basin Aboriginal peoples and their representative organisations, including (but not limited to) the Murray Lower Darling Rivers Indigenous Nations (MLDRIN) and Northern Basin Aboriginal Nations (NBAN). More specifically, these baselines will be of crucial importance to current government efforts to develop new policies and programs targeted at improving Aboriginal water access in line with national water policy; evaluate and monitor existing plans and programs (including the Basin Plan); and, assist First Nations people to contribute to water policy. It also complements the recent assessment of social and economic conditions in the MDB (Sefton et al., 2020).

Terminology, scope, and structure

In this report, we use “Aboriginal” or “First Nations” in preference to “Indigenous” when referring to the First Peoples of Australia’s mainland. We reserve the use of the term “Indigenous peoples/persons” for describing Census population and demographic statistical information, which combines those people who identify as of Aboriginal and/or Torres Strait Islander origin.

There are many ways that First Nations can access, use, benefit from and care for water (Jackson, 2017; Ribot & Peluso, 2003; Gimelli, Bos & Rogers, 2018). There are many different types of water rights such as, but not limited to, rights to access, withdraw, manage, and exclude others from water resources (Schlager & Ostrom, 1992) and these property systems rarely acknowledge the rights of Indigenous peoples (Jackson, 2018). Across the MDB, First Nations hold inherent rights to water—and Country more broadly. These rights are described in a National Cultural Flows Research Project report: “First Nations Peoples have rights and a moral obligation to care for water under their law and customs. These obligations connect across communities and language groups, extending to downstream communities, throughout catchments and over connected aquifer and groundwater systems” (MLDRIN, NBAN & NAILSMA, 2017, p. 3). First Nations aspire to have their sovereign claims

to water recognised and for appropriate forms of economic activity based on water utilisation (MLDRIN, 2010).

The scope of this report concerns the means by which First Nations access and benefit from water via state-issued, or statutory, water entitlements that grant holders permission to take, extract and use water from surface water sources (such as rivers and creeks) and groundwater sources (aquifers). The report does not consider statutory rights to access water that do not require an entitlement, including water use rights associated with land occupation like stock and domestic basic rights and native title rights to water, for example.[1] There have been several successful native title claims in the MDB that have included rights that are relevant to water (see Hartwig, Jackson & Osborne, 2018).

This report concerns both surface water and groundwater, but generally treats them separately. We acknowledge this separation runs counter to Aboriginal peoples' understandings and conceptions of water systems and Country (see MLDRIN, NBAN & NAILSMA, 2017; Moggridge, 2020). State water agencies treat surface water and groundwater entitlement systems separately, with separate water accounting methodologies for each (see, for example, MDBA, 2019f), and so we have followed that convention in order to enable comparisons and standardisation.

For several reasons, the report places greater emphasis on access to surface water over groundwater. First, previous baselining exercises (Altman & Arthur, 2009) showed that Aboriginal entities held few groundwater entitlements, and our research confirmed the low rate of access to groundwater. Second, there are far fewer groundwater entitlements on issue across the Basin. For example, in the 2018-19 water year, 88% of water entitlements by volume across the Basin related to surface water sources, with the remaining 12% to groundwater sources (BOM, 2020).

The diverse ways in which Aboriginal entities use or aspire to use, manage, or benefit from their water entitlements is beyond the scope of this report but is nonetheless an important topic of future research. We note that following the principle of the right to self-determination enshrined in international law (Robison et al. 2018) and the Australian cultural flows concept (see Section 2), water use is a matter for First Nations to decide. Water use may include temporary trade of water, which has the potential to generate income for Aboriginal organisations that can then be used for an array of social, community or economic outcomes, as determined by that organisation and community (see Hartwig, 2020).

This report is structured as follows. First, we briefly detail the historical, legislative and policy context of Aboriginal water rights in the MDB, as well as the growing calls for water redistribution to First Nations from not only First Nations and researchers, but also governments and industry bodies. As part of this background and context, we also draw attention to the dearth of current information about Aboriginal socioeconomic and demographic conditions, and Aboriginal water access in the Basin. We consider the implications for developing evidence-based policy and programs to improve First Nations' water access. Together, this information points to the need for current Aboriginal population and water-holding baselines. After outlining the methods used to develop these baselines, we then present key findings, then discuss the findings in the context of research, policy development and other ongoing water reviews. We conclude with recommendations for policy and future research.

[1] See Appendix G for a brief list of alternative water access options.

The key baselines developed as part of this work are presented in the first three appendices to this report. Appendix A lists the 2016 population baseline, Appendix B lists the 2020 Aboriginal surface water holdings baseline, and Appendix C lists the 2020 Aboriginal groundwater holdings baseline.

2. Background

First Nations peoples have relied on waters and waterways for their survival in Australia for tens of thousands of years, including in the MDB. The Basin overlaps with over 40 First Nations' customary territories. For many Nations, water and waterways are central to livelihoods, socio-cultural practices, and identities. The Barkandji People's name, for example, literally means people belonging to the river *Barka* (the Darling River). Interconnected land and water systems (both surface waters and groundwaters) are vested with religious and cultural significance (Moggridge, 2020; Morgan, 2011; Robison et al., 2018; Weir, 2009). Figure 1 illustrates the relationship of First Nations' territories to surface water management units across the Basin (called Water Resource Plan areas, described further below).[2]

Throughout the history of the MDB and the development of its water resources First Nations peoples were excluded from the institutions that governed water use and management. Godden, Jackson & O'Bryan (2020) argue that water laws (and land laws where they governed rights to water) were pivotal to the dispossession of First Nations. Aboriginal peoples were denied riparian rights and access to statutory water entitlements under colonial, then state, laws (Berry & Jackson, 2018). Governments ignored Aboriginal peoples when making decisions about water (e.g. in the early inter-governmental agreements relating to the River Murray) and when building the water-based economy, including the regulatory regime that gave rise to the water market (Downey & Clune, 2020; McAvoy, 2006, 2008). Aboriginal water rights in Australia are now receiving greater research and policy attention. However, as the following description indicates, Australian water laws and policies have not yet adequately addressed Indigenous water rights and claims (Jackson, 2017; Tran, 2009), especially the redistribution of rights to use water for commercial purposes. Indeed, many see this neglect as the "unfinished business" of Australia's water policy (Jackson, 2017, p. 122; MLDRIN, NBAN & NAILSMA, 2017, p. 4; Productivity Commission, 2017, p. 11).

[22] An equivalent groundwater map is provided later, on page 13.

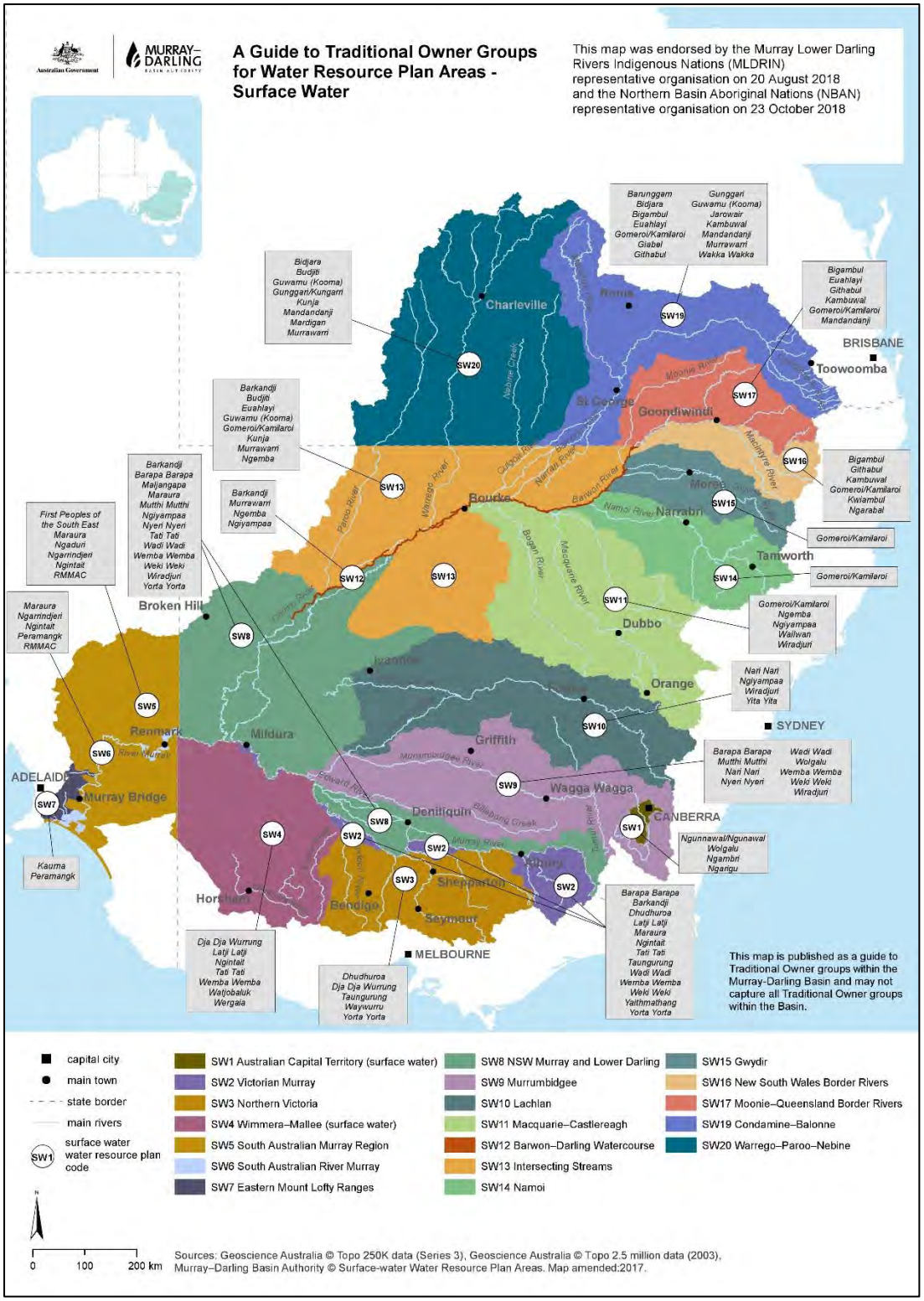

Figure 1: A guide to Traditional Owner Groups for Surface Water, Water Resource Plan areas in the Basin

Legislative and policy context: First Nations' water rights in the Murray-Darling Basin

The first national act of recognition of the distinct water rights, interests and values of Aboriginal peoples was the passage of the *Native Title Act 1993* (Cth) (*NTA* hereafter). The *NTA* (section 223) defines native title as the communal, group or individual rights and interests of Aboriginal or Torres

Strait Islander peoples in relation to land *and* waters. O'Donnell (2013) argues that there are two propositions that are clear in relation to native title rights to water in Australia. The first is that native title does not include ownership of natural waters. That is on the assumption that the common law position is that water in its natural state is not amenable to ownership. The second proposition is that where native title can be proven to exist, it generally includes rights to take and use water for personal, social, domestic, and cultural purposes, but not commercial uses. It can include:

- a right to teach the physical and spiritual attributes of places and areas of importance on or in the land and waters;
- the right to have access to, maintain and protect places and areas of importance on or in the land and waters; and
- a right of access to take water for those purposes.

Under the *NTA*, rights to hunt, gather and fish for the purposes of satisfying the personal, domestic, or non-commercial needs of native title holders can be exercised free from licensing or permit restrictions that otherwise apply to such activities. The same exemption applies to cultural and spiritual activity and other kinds of activity that may be later prescribed, provided the activity involves the exercise or enjoyment of native title rights and interests. A native title right to take and use water for commercial purposes has not (yet) been recognised (O'Donnell, 2013).[3] There is however, increasing recognition that Indigenous rights to water should include commercial rights (Godden et al. 2020). Indigenous advocacy has promoted this viewpoint and it has gained some limited traction, influencing national water policy towards recognition of resource rights.

The *NTA* provides that a State/Territory Parliament may make and amend water management legislation and issue entitlements or permits to take and use water and validly affect the native title right to water (O'Donnell, 2013).A right to compensation and the "principle" of the non-extinguishment of native title applies in such circumstances. A procedural right of notification and an opportunity to comment applies prior to the grant of any licence to take water.

Establishing native title has become difficult as amendments to the *NTA* and decisions of Australian courts have adopted an overly specific and restrictive approach to Indigenous rights. In relation to water, a number of scholars further argue that Australian water managers take a narrow view of their obligation to protect native title from impairment by over-allocation upstream or general encroachment (Behrendt & Thompson, 2004; McAvoy, 2006; 2008; Tan & Jackson, 2013).

The emergence of the native title framework in the 1990s coincided with the first tranche of water reforms, including the separation of land and water titles and the creation of a water market. These early reforms did not account for Aboriginal rights and interests in water.

Some Australian States and Territories amended their water laws to recognise the existence of native title (e.g. NSW). Some initiatives apply to the water planning context, such as Indigenous-specific water entitlements in NSW. These are a subcategory of mainstream water entitlement specifically for Aboriginal peoples' use or benefit. However, as addressed elsewhere, these entitlements have had little take up due to their restrictive conditions, low community awareness or interest, costs required to access, use or store the water, and obstacles to application (Hartwig, 2020; Jackson & Langton, 2012; Sefton et al., 2020; Tan & Jackson, 2013).

[3] While the possibility for economic uses and benefits of native title rights to natural resources, including water, has emerged in recent years, including as a recommended area for legislative reform (Australian Law Reform Commission, 2015), this has not yet eventuated.

More than a decade after the introduction of the *NTA*, in 2004 Australian governments agreed to the National Water Initiative (NWI). This national blueprint for water reform set expectations for state and territory water access and planning frameworks. The NWI recognised Indigenous water rights and interests (Jackson & Morrison, 2007), although Indigenous people were not involved in shaping this important policy (Jackson, 2017). The NWI establishes a "Water Access Entitlements and Planning Framework" that lists Indigenous needs in relation to water access and management as an outcome (see NWI 2004, cl 25). The Parties to the NWI are to provide for Indigenous access to water resources by:

- including Indigenous representation in water planning, wherever possible; and,
- incorporating Indigenous social, spiritual, and customary objectives and strategies for achieving these objectives, wherever they can be developed.

Water planning processes are also expected to take account of the possible existence of native title rights to water in surface water or groundwater areas by:

- potentially allocating water to native title holders; and,
- accounting for any water allocated to native title holders for traditional cultural purposes (NWI 2004, clauses 52-54).

The NWI and these principles, however, have been criticised for their weak and discretionary nature (Jackson & Morrison, 2007; Marshall, 2017). No penalties are imposed on State and Territory governments for poor or non-compliance and therefore, there is little incentive to drive change that meaningfully recognises and accommodates Aboriginal water rights (Marshall, 2017; Tan & Jackson, 2013). Reviews by government agencies have consistently identified these weaknesses (NWC, 2009, 2011, 2014; Tan & Jackson, 2013). More recently, the Productivity Commission (2020) has been tasked with reviewing the NWI and the Commonwealth Government has identified the need to improve Indigenous access under a revised NWI.

Soon after the NWI was agreed, and at the peak of Millennium Drought, the *Water Act 2007* (Cth) was passed. It implemented reforms as directed by the NWI, such as legislating the Australian Government's roles in water governance and dictated the development of the Murray Darling Basin Plan (Ridge, 2016). The Australian Government pledged approximately A$13 billion to develop and implement instruments to recover 2,750 GL/y (long-term average annual yield) of water for environmental purposes via entitlement buy backs through the water market and improvements to water infrastructure efficiency (Grafton & Wheeler, 2018). Amendments to the Basin Plan since 2012 have reduced this long-term average recovery volume. At present, the Basin Plan aims to recover 2,075 GL/y of water plus 450 GL/y through efficiency measures and rule changes through the SDL Adjustment Mechanism by 2024 (see MDBA, 2020c).

The *Water Act 2007* (Cth) contains various process and consultation requirements relating to First Nations[4] allowing for participation and representation in several specific ways.[5] The Basin Plan

[4] The *Water Act 2007* stipulates that the MDBA's functions include engaging "the Indigenous community on the use and management of Basin water resource" (section 172(1)(ia)) and developing a Basin Plan that has regard for Indigenous issues (section 21(4)(v)). It stipulates the Basin Plan must, as "mandatory content", include a description of all water resource uses in the Basin including by Indigenous peoples (section 22(1)). It also instructs that WRPs have regard to "social, spiritual and cultural matters relevant to Indigenous people in relation to the water resources of the water resource plan area in the preparation of the water resource plan" (section 22(3)(ca)). The *Water Act 2007* specifies that restrictions on water use or extraction from water trading can only arise to manage certain issues one of which is features of major Indigenous, cultural heritage or spiritual significance (schedule 3).

[5] For example, the *Water Act 2007* reserves two positions on the Basin Community Committee for "Indigenous persons with expertise in Indigenous matters relevant to the Basin's water resources" (section 202(5)) and the development of an Indigenous water subcommittee "to guide the consideration of Indigenous matters relevant to the Basin's water resources" (section 202(3)). From the Basin Plan, the

includes processes to address Indigenous peoples' water interests. Specifically, Chapter 10, Part 14 of the Basin Plan stipulates how Basin States and Territories are to have regard to Indigenous values and uses in the development of Water Resource Plans (WRPs). In preparing WRPs, States are also required to have regard for native title rights, native title claims and Indigenous Land Use Agreements (Godden et al. 2020). The Basin Plan is specifically required to provide information about Indigenous uses of Basin water resources (see Section 22 (1)). In 2019, an amendment to the *Water Act 2007* (Cth) passed to enable the appointment of an Aboriginal representative to the MDB Authority, but at the time of writing, no appointment had been made more than 12 months later (Foley, 2020).

Established under the *Water Act 2007* (Cth), the MDBA has developed and deployed a number of Basin-wide policy and program partnerships and activities aimed at improving, empowering, and recognising Aboriginal water interests (see Jackson, Woods & Hooper, 2021; MDBA, 2017a). These measures to advance First Nations rights and interests still fall short of requirements under international instruments such as the UNDRIP (Godden et al., 2020). Many have criticised the *Water Act 2007* (Cth) for these reasons.

In summary, Aboriginal people have entered the current era with very limited water holdings. This is because of several overlapping factors. First, initial British occupation dispossessed most Aboriginal peoples of their land, and the water rights attached to land. Then, land restitution processes introduced from the 1970s onwards, limited the amount of irrigable land (land with water entitlements attached) available for Aboriginal people to claim (Hartwig et al., 2020). Around the time that these restrictive land restitution processes were introduced and native title rights (rights to land and water) were recognised by the common law, the legal frameworks regulating water were restructured. Changes included the separation of land and water titles and the establishment of water markets. At this critical juncture in water governance reform, governments exacerbated the inequitable pattern of water rights distribution that they had inherited from the colonial era by grandfathering water rights to then existing rights-holders (Hartwig et al., 2020). At the same time, key water resources in the Basin were "closed" to establish water markets and restore waterways.

Moreover, native title and specific purpose licence mechanisms have so far offered no meaningful means of redistributing water use rights. The constellation of these circumstances has strongly shaped current patterns of non-Aboriginal and Aboriginal water access such that in the majority of surface water systems across the MDB, there is no unallocated water for Aboriginal people to apply for, as others have done for generations. Instead, the water market is now the only option for Aboriginal people to secure water entitlements that are equivalent to those held by other water users (Jackson, Hatton MacDonald & Bark, 2019; Productivity Commission, 2017).

First Nation, government and industry calls to redistribute water to First Nations

First Nations developed the concept of "cultural flows" (MLDRIN, 2010; Weir, 2009) as a response to dispossession and exclusion from water governance. The concept emphasises Aboriginal control and self-determination in the outcomes to be achieved from using water (Mooney & Cullen, 2019; Morgan, 2011; Weir, 2009), and it has gained some traction in Australian water management circles.

In 2007, First Nations developed a formal definition for cultural flows in the Echuca Declaration:

> "Cultural Flows" are water entitlements that are legally and beneficially owned by the Indigenous Nations of a sufficient and adequate quantity and quality to improve the

MDBA is required to "have regard" for Indigenous values and uses in developing the Basin-wide environmental watering strategy (clause 8.15(4)) and annual environmental watering priorities (clause 8.29(3)).

> spiritual, cultural, environmental, social and economic conditions of those Indigenous Nations. This is our inherent right. (MLDRIN, 2010)

The MDBA has committed to supporting the establishment of dedicated cultural flows, recognising that "dedicated cultural flows are not currently part of the water management system in Australia" (MDBA, 2019a). It supported the seven-year National Cultural Flows Research Project that commenced prior to the Basin Plan.[6]

The National Cultural Flows Research Project produced a series of reports that have advanced understanding of cultural flows (https://culturalflows.com.au/). A key component of the project involved developing a methodology for determining and quantifying the flow regimes needed to achieve cultural flow objectives and outcomes. The research included testing this method at two case study locations in NSW, and documenting the associated spiritual, cultural, environmental, social, and economic benefits (MLDRIN, NBAN & NAILSMA, 2017). A key recommendation from the project was that "First Nations require the permanent and ongoing ownership of water for cultural flow purposes that has the same status as commercial water rights, and with the flexibility to ensure the long-term development of sustainable enterprises" (MLDRIN, NBAN & NAILSMA, 2017, p. 20).

Consistent with this recommendation, recent reviews and submissions from government entities and irrigation bodies (see National Irrigators' Council, 2017) indicate acceptance of, and indeed support, the need for water rights to be redistributed to First Nations in the Basin (and Australia more broadly). For example:

- The Productivity Commission (2017) recommended that "where access to water is regarded as the best way to support Indigenous economic development objectives, governments should facilitate access to that water as efficiently and transparently as possible within existing entitlement frameworks" (p. 108). An upcoming review by the Productivity Commission will investigate this matter further (see Productivity Commission, 2020).
- The Northern Basin Commissioner identified that Aboriginal water access and redistribution requires greater attention from governments. He noted that "Aboriginal entitlement to water is unresolved compared with Aboriginal title in land" (Keelty, 2019, p. 33).
- The Independent Panel for the Assessment of Social and Economic Conditions in the MDB (Sefton et al., 2020) includes a number of recommendations in their recently published report that stress the need for governments to improve First Nations communities' access to water for cultural and economic purposes, including support for Aboriginal enterprise development.

Recent research indicates public support for redistribution to Aboriginal peoples via existing market mechanisms (Jackson et al., 2019).

At both the Federal and State government levels, a number of policies and programs targeted at improving Aboriginal water access are under development (see, for example, DAWR, 2018; DNRME, 2019; see also Appendix G). To develop these programs and policies, as well as monitor and evaluate any that are established, governments, agencies and Aboriginal advocates require accurate data on current Aboriginal socioeconomic demographics (Taylor & Biddle, 2004) and their water-related experiences. However, this information is not readily available (Marsden Jacobs, 2019; Nikolakis & Grafton, 2015; Nikolakis, Grafton & To, 2013). Most recent research and analysis about Indigenous population and Aboriginal water holdings within and across the MDB is now dated and/or is incomplete, as we detail below.

[6] Of note, State and Territory developed WRPs "must be prepared having regard to the views of Indigenous people with respect to cultural flows" (Basin Plan cl 10.54).

Most recent Indigenous population and water holdings baselines

Indigenous peoples of the Basin have a distinctly different socio-economic status and demographic composition to the non-Indigenous population, including lower rates of employment and lower household incomes. The Indigenous population is also relatively younger and rapidly increasing in comparison to the non-Indigenous population (ABS, ABARE & BRS, 2009; Taylor & Biddle, 2004).

The most recent population statistics for State portions of the MDB cited in most publications were provided by Taylor and Biddle (2004) using 2001 Census data, making these estimates now close to 20 years old. In 2009, the ABS et al. estimated Aboriginal population statistics from 2006 Census data, but these were reported for Sustainable Yield Regions. The CSIRO originally developed this geography to assess water availability (see CSIRO, 2018) but it was used in a number of other studies, including ABS et al. (2009). The reporting associated with the Basin Plan, however, now uses different areas or geographies called SDL resource units or Water Resource Plan (WRP) areas.[7] In other words, the ABS et al.'s (2009) population estimates do not align with current mapping and reporting conventions, making comparisons over time difficult. Most recently, the Wentworth Group of Concerned Scientists (2017) provided an Aboriginal population estimate using 2016 Census data, but only at the Basin-wide scale.

Clearly, there is a pressing need for up-to-date Aboriginal population statistics at smaller scales in the Basin, especially when evidence indicates that Aboriginal populations have grown considerably in the MDB since 2001 (ABS et al., 2009; Wentworth Group of Concerned Scientists, 2017). Conversations with MLDRIN leadership as far back as March 2016[8] indicate community demand for this kind of information. The recent independent assessment of social and economic conditions in the Basin has confirmed the need for this data (see Sefton et al., 2020).

Available information about Aboriginal water holdings is also severely limited and dated. In 2009, Altman and Arthur completed a scoping exercise that documented "for the first time actual allocations of water licences and entitlements to identified Indigenous users" across Australia (p. i). This work set an important benchmark and illuminated numerous gaps in knowledge and in institutional and governance arrangements. Arthur (2010) completed a similar exercise soon after focusing on the MDB. However, for several reasons there is a need to develop a more detailed and refined Aboriginal water holdings baseline.

First, in Altman and Arthur's (2009) work, Aboriginal-held entitlements are reported at the level of each State and Territory, but they do not identify those that are within the Basin. Although a later study by Arthur (2010) focuses explicitly on the MDB, only aggregate volumes of Aboriginal-held water entitlements are presented (not individual entitlements as Altman and Arthur (2009) present), and for the Sustainable Yield Regions that are no longer used by water regulators.

Second, Federal and State water policy and legislation have altered since 2009, sometimes quite significantly, and this has seen the character of some entitlements change, including those held by Aboriginal entities. Third, recent research by Hartwig (2020; see also Hartwig, et al., 2020) indicates that there have been significant changes (declines) to Aboriginal water holdings in NSW since Altman and Arthur's 2009 baseline. Hartwig et al. (2020) found that Aboriginal surface water holdings have decreased by almost 20% across the past decade (from 2009 to 2018) in the NSW portion of the MDB. The results revealed that Aboriginal people now represent nearly 10% of the NSW MDB

[7] This impact of different geographies in the context of this report's methods is considered further in Section 3.

[8] In March 2016, Lana Hartwig attended a MLDRIN Board meeting in Mansfield, Victoria, seeking advice about what research outputs MLDRIN would find useful in its operations.

population but hold only 0.2% of the available surface water. In analysing these results, the authors came to appreciate the urgent need for a wider MDB analysis of Aboriginal water holdings beyond NSW.

It is clear to the MDBA that updated baselines for these two features—population and water holdings—together with other research currently underway, will serve not only as useful inputs for the development of the aforementioned Aboriginal water access programs, but also as important benchmarks for the 2020 Basin Plan evaluation and others. Moreover, baselines like these can help to generate "essential input to the identification of priority regional development issues and [assist] in the building of capacity for Indigenous nations' governance by enhancing the flow of information and degree of local knowledge of social and economic circumstances" (Taylor & Biddle, 2004, p. 1).

Water policy and management terminology used in this report

To round out this background section, we briefly explain the terminology we use in this report. We explain some key differences between surface water and groundwater in terms of government water policy and management, water entitlement features, and how entitlement holders use and extract water from surface sources and groundwater sources.

As noted, the Basin Plan exists alongside, and is intended to complement, State, Territory and other Federal water and natural resource management frameworks and policies. In this way, Basin State and Territory governments and the Australian Government share responsibilities for developing, amending, implementing, and monitoring the compliance of water laws and rules.

The Basin Plan 2012 set limits on how much water can be taken from surface and groundwater resources across the Basin. These limits are called *Sustainable Diversion Limits* (SDLs) and consider the water used by towns, communities, irrigators, farmers and other water extractions (i.e. not the environment). These limits were set for specific water management areas across the Basin, called *SDL resource units*. *Baseline Diversion Limits* (BDLs) were also determined for each SDL resource unit area, which approximate the scale of water diversions prior to the Basin Plan commencing.

Defined areas of water management in the MDB build on each other like a scaffold. SDL resource unit areas are the smallest. One or more SDL resource unit area combines to make up Water Resource Plan (WRP) areas, the next largest water management area. Under the Basin Plan, State and Territory governments are tasked with developing WRPs that set the rules for sustainable management of water resources in each defined WRP area.

Surface water

Looking at surface water only, across the MDB there are 29 defined SDL resources units contained within 19 WRP areas, with the latter depicted earlier in Figure 1. These surface water management units are based on topographical and landscape formations. It is worth pointing out that the Barwon-Darling Watercourse SDL resource unit and WRP area are unique in that they only include the watercourse i.e. the river channel (see Figure 1 earlier, for WRP area). All other surface water management units include watercourses and at least some adjacent land area that drains to the watercourse.

For the purpose of managing surface water, the MDB is separated into the *Northern Basin* and the *Southern Basin* (see Wheeler & Garrick, 2020; Figure 2).[9] This divide is also used to determine Nation

[9] All references to Northern Basin and Southern Basin in this report are taken to be surface water units.

membership in NBAN and MLDRIN (respectively). We note that that First Nations' territories do not align with these water management units.

For surface water, SDLs are generally lower than BDLs. At a Basin scale, this necessitated a reduction in the average annual level of surface water extractions by about 25% (Grafton, 2019). Work has been underway to reduce water extractions to the new lower levels by recovering water for the environment. Australian governments have been bridging this gap primarily through water buybacks and efficiency upgrades to water infrastructure (Grafton & Wheeler, 2018). We note that a recent policy change has ruled out further buybacks for water recovery (DAWR, 2020), and some are concerned about the implications for reaching SDLs on time (Davies, 2020).

Figure 2: The boundary of the Murray–Darling Basin, including the boundaries of the Northern and Southern Basins

Groundwater

For groundwater sources, there are 80 defined SDL resource units grouped into 19 WRP areas. Figure 3 shows how First Nations' territories overlap with Basin groundwater WRP areas and that groundwater WRP areas (and also SDL resource units) sometimes overlap. This is because

groundwater management units are defined based on hydrogeological formations, rather than topographical and drainage features. This means that groundwater SDL resource units and WRP areas can be vertically stacked. Individual groundwater sources also have varying hydrological connections dependent on their geological layers. Surface water and groundwater sources can be hydrologically interconnected, and so the management of water resources in a given area requires a consideration of both surface water and groundwater, as well as the nature of their connectivity.

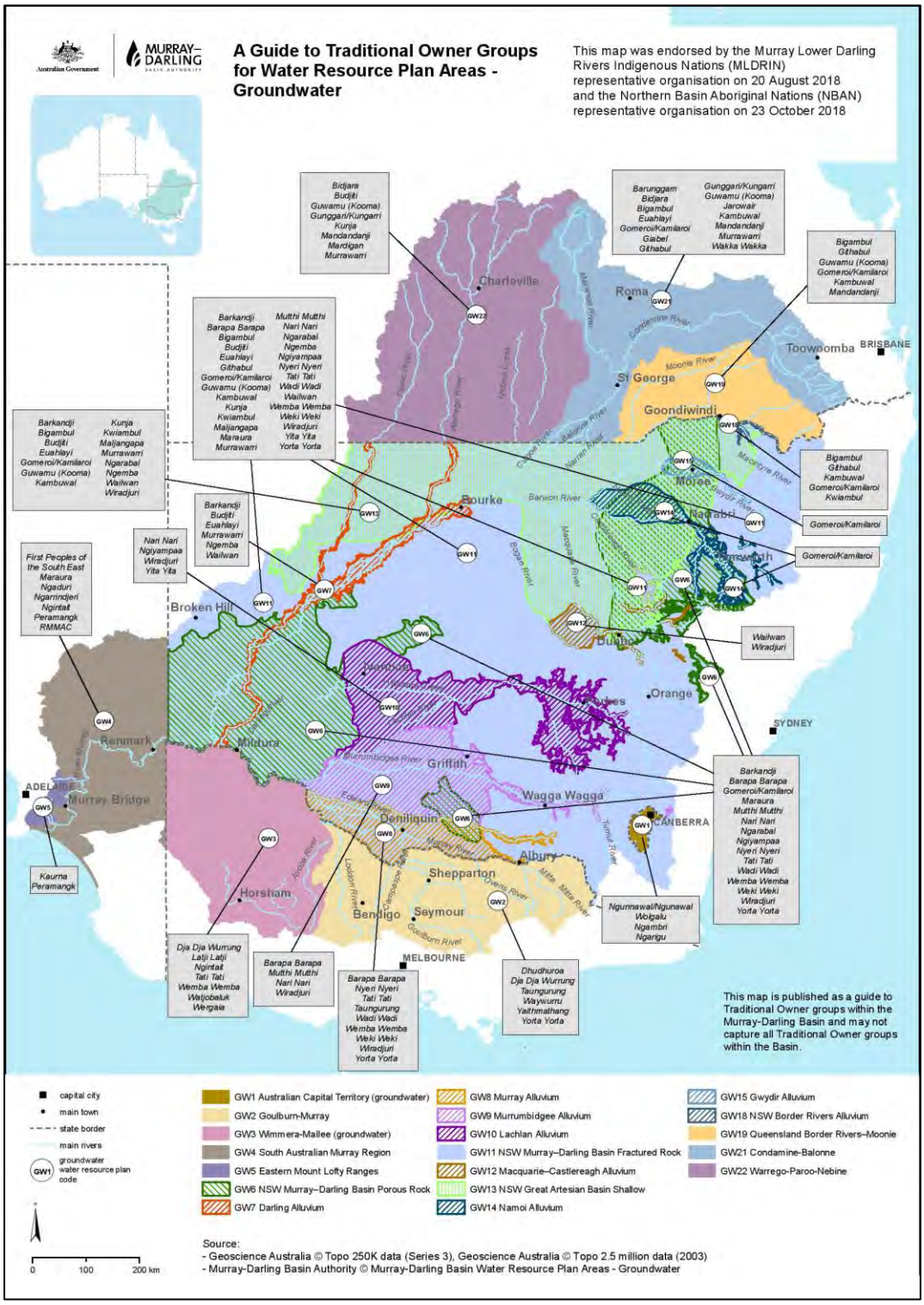

Figure 3: A guide to Traditional Owner Groups for Groundwater Water Resource Plan areas in the Basin

In contrast to surface water, most groundwater SDLs are equal to or greater than the BDL, meaning that there is often potential for groundwater take to increase in the future within the settings of the Basin Plan.[10] Indeed, following amendments in 2018, the Basin Plan now sets a Basin-wide groundwater SDL that is 40% greater than the Basin-wide BDL (Grafton, 2019).

Water use entitlements

State and Territory governments distribute licences or entitlements to access and use water in the MDB (and indeed, across Australia). Figure 4 below shows the difference between water entitlements and water allocations. Water entitlements are rights to an ongoing share of available water, also called a water licence in some jurisdictions. For ease of explanation, a water entitlement can be represented as an empty, fixed-volume bucket (Figure 4). Water allocations are the amount of water that a water entitlement holder can actually use. The relevant State or Territory authority distributes them to water entitlements seasonally. In other words, allocations are the amount of actual water available in the fixed-volume bucket entitlement. Allocation volumes change from year to year, based on storage conditions, expected weather patterns, entitlement type, and legislated triggers. Allocations are usually announced as a proportion of the entitlement volume.

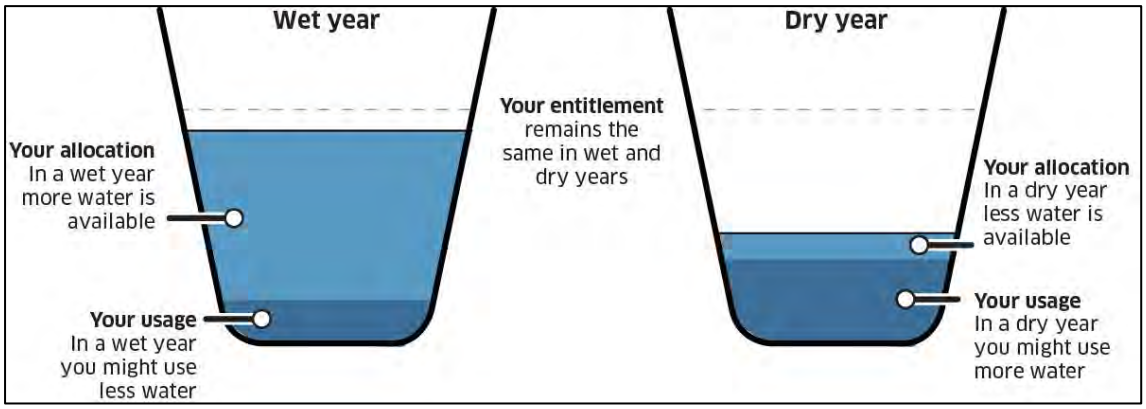

Figure 4: Variable water allocations versus constant entitlements across wet and dry years
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There are different types of water entitlements, but some are prioritised to receive allocations first. Entitlements with lower reliability receive lower—sometimes no—allocations in drier years (seen on the right in Figure 4). *Reliability* is "the likelihood of an amount of water being allocated to a particular class of entitlements" (MDBA, 2019b) over the water year, which runs from July to June.

Among surface water entitlements, Domestic and Stock entitlements are prioritised in legislation as the most reliable. Water entitlements exist in both *regulated* systems (where flows are controlled through infrastructure (such as dams and weirs that store and release water) and *unregulated* systems (where water use is far less controlled by infrastructure). Regulated water entitlements have different levels of reliability while entitlements in unregulated systems generally have no formal reliability (Wheeler et al., 2014a). Overall, the Northern Basin is more unregulated and hydrologically disconnected,[11] while the Southern Basin is more regulated and hydrologically interconnected.

Concerning groundwater, State water management plans generally allow 100% allocation of groundwater entitlements, unless they announce a lower percentage. In the 2017-18 water year,

[10] The exception here is two groundwater SDL resource units in Queensland's Condamine-Balonne WRP area where the SDLs are lower, requiring water recovery (MDBA, 2020b).

[11] 'Disconnected' means that that the flows and systems can be disconnected throughout the year, or over time.

only NSW, Queensland and Victoria announced allocations of less than 100% in specific groundwater SDL resource units or sub-areas (MDBA, 2019f). Reduced allocations may be announced when groundwater falls below particular legislated thresholds intended to protect the productive base of the aquifer.[12] While these entitlements receive high allocations and might appear nominally more reliable or secure, the quality (salinity) of and ease of access to groundwater resources varies across groundwater resources (MDBA, 2016). These and other factors mean that the actual volume of groundwater take in any given year is often less, sometimes significantly so, than the total volume available under groundwater entitlements.

[12] Such thresholds are important, for instance, for preventing localised drawdown which may limit access to neighbouring bores, land subsidence, or mobilisation of salinity or other water contaminants. In NSW, for example, if the long-term average annual extraction limit compliance test (established in Water Sharing Plans) is exceeded, the Minister may make an announced water determination (AWD) of less than 100% for aquifer entitlements in the next water year. In the 2019-20 water year, NSW made AWDs in several groundwater sources to reduce extractions after increased take and limited rainfall recharge through the recent drought (see NSW DPIE, 2019).

3. Methods

Indigenous population baseline (2016)

Population statistics presented in this report are from custom calculations of Indigenous and non-Indigenous Estimated Residential Populations (ERP) by Dr Francis Markham. These calculations relied on the 2016 Census (ABS, 2017, 2018b) and MDBA geographical units (2019e). For the purposes of consistency with the geographical units used by the MDBA, we chose surface water management units as the units for measuring and analysing population data. Further detail on the method and approach used to develop these estimates is presented in Appendix D.

Using Census data for Aboriginal population statistics has limitations (see Morphy, 2010; Taylor, 2011; Taylor & Biddle, 2010). For instance, at a conceptual level, Census and other government administrative counts presume of "a degree of homogeneity and sense of collective identity that simply does not match Indigenous peoples' actual sociality and spatiality" (Taylor, 2011, p. 287). These administrative counts have little regard for the complexity of First Nations peoples' social and economic relations (Morphy, 2010; Taylor, 2011).

Additionally, Census instruments substantially undercount Indigenous peoples (ABS, 2018a; Taylor, 2011; Taylor & Biddle, 2010). The 2016 Census, for example, did not count around 17.5% of Indigenous people in Australia (ABS, 2018a; see Appendix D). The reliance by government agencies on "official" counts that do not accommodate this undercounting have led to inadequate service delivery (Morphy, 2010; Taylor & Biddle, 2010). The ABS has developed strategies to adjust for undercounting, including produced ERP figures (Markham & Biddle, 2018). Another issue can also arise where Indigenous persons counted on Census night are "higher (often much higher) than expected on the basis of previous census levels and after accounting for intercensal change in basic demography—births, deaths and migration" (Taylor & Biddle, 2010, p. 470).[13] This issue was more common than undercounting in much of the MDB based on 2006 Census analysis (Taylor & Biddle, 2010) and 2016 Census analysis (Markham & Biddle, 2018).

Notwithstanding the above, the best available information about Indigenous populations across Australia comes from Census counts and surveys (Markham & Biddle, 2018). Indigenous population statistics can still be useful for developing policy, and monitoring and evaluating its effectiveness into the future (Taylor, 2011; Taylor & Biddle, 2004). To improve accuracy and reliability in this report, we report ERP figures to account for possible undercounting and acknowledge that these figures are likely minimal estimates. We also generally report population estimates for larger regions (rather than small-scale estimates for remote localities where undercounts can be worse (see Taylor & Biddle, 2010)).

Aboriginal water entitlement baseline (2020)

As noted, the MDBA commissioned this work following research that Lana Hartwig completed as part of her PhD at Griffith University. With assistance from the MDBA's Marcus Finn (Senior Director of Water Resource Plans and Basin Policy) and Tony McLeod (General Manager of SDL Accounting and Aboriginal Partnerships Branch), Hartwig (2020) developed a method to standardise Aboriginal surface water holdings in NSW that is compatible with current Basin Plan accounting methods. The method outlined here is similar and includes two steps: (1) identifying and (2) "standardising" Aboriginal held water entitlements for comparison. Due to significant differences between surface

[13] Markham and Biddle (2018) describe factors contributing to this intercensal change, including changes in the ways that respondents identifying themselves as being of Aboriginal and/or Torres Strait Islander in Census surveys, identification of children from mixed Indigenous-non-Indigenous partnerships identifying as Indigenous and improving Census methodologies.

water and groundwater management, different "standardising" methods are required for the two, as detailed below.

The 2020 Aboriginal water holdings baseline produced through this method is contained in a separate confidential database, in accordance with privacy requests from some Aboriginal water holders interviewed as part of Hartwig's PhD research, as well as some State and Territory agency staff that assisted in compiling this 2020 baseline. This baseline presents a snapshot in time of Aboriginal water holdings, the number of which are always changing (c.f. Altman & Markham, 2015).

The scope of this baseline exercise concerns entitlements held by Aboriginal organisations and entities only, not individuals. This is because the search functions of water registers do not identify individual Aboriginal people who might hold water entitlements (explained further below). We have taken the broadest understanding of Aboriginal organisations including Land Councils, Traditional Owner groups, Native title claimant or prescribed body corporate groups, Aboriginal Corporations, Associations, Housing Co-ops, or any other Aboriginal owned organisation or entity, where there is a majority of Aboriginal participation on the governance structure.

Identifying Aboriginal held water entitlements

Figure 5 presents the overarching approach we used to identify and confirm which Aboriginal organisations hold water in the MDB. The only known publicly available data regarding existing water licences held by Aboriginal peoples was generated by Altman and Arthur in 2009. We used this as a starting baseline and took direction from their methodology.

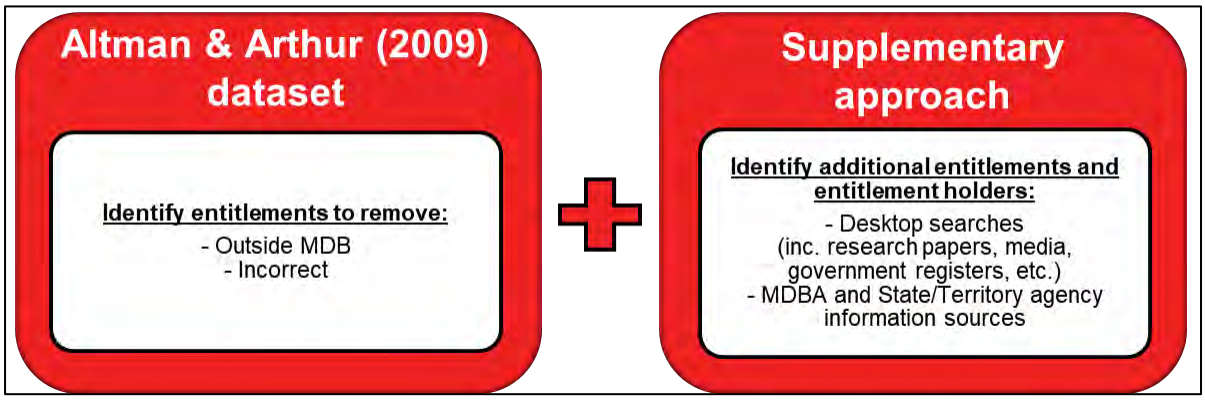


Figure 5: Methods for identifying actual and possible water holding Aboriginal organisations

Altman and Arthur's (2009) list water entitlement data for four Basin States: NSW, Queensland, Victoria, and South Australia. The ACT was the only Australian Territory or State excluded from their scope. The data was the most comprehensive for the NSW jurisdiction, with water entitlement information listed for the remaining three Basin jurisdictions (Queensland, Victoria, and South Australia) appearing incomplete and/or inconsistent. This is partly due to low institutional understanding about Aboriginal water holdings at the time of this work, a tight timeframe in which to complete it, and limitations to entitlement register searching (Altman & Arthur, 2009).

When Altman and Arthur compiled their 2009 baseline there was (and still is) no straightforward way to identify water entitlements held by Aboriginal entities. State and Territory jurisdictions do not have any Indigenous "identifiers" in water entitlement registers. Entitlements held by Aboriginal organisations can, though, potentially be identified through searching water entitlement registers (where possible) for terms like, "Aboriginal", "Indigenous", "tribal", etc., which often—but not always—appear in the names of Aboriginal organisations.

We began with Altman and Arthur's 2009 dataset. For this project, out of scope licences in that database were excluded (entitlements for water sources outside of the Basin as well as entitlements under former water management frameworks that no longer exist)[14]. We also deployed a multi-pronged supplementary approach to identify other Aboriginal groups that (may) hold water entitlements currently. This was necessary due to limitations identified by Altman and Arthur (2009) as well as findings from Hartwig (2020) which indicate some changes to Aboriginal surface water holdings since 2009. The supplementary approach included:

- desktop searching for other Aboriginal organisations that held water licences, and/or large land grants in the MDB that may have included water transfers;
- asking the MDBA, as well as Basin State and Territory Aboriginal engagement staff from water agencies, about current Aboriginal water entitlement holders; and,
- searching other databases, including the Office of the Registrar of Indigenous Corporations, and land acquisition data collected by the MDBA.

By combining this with the amended Altman and Arthur 2009 baseline we generated a list of potential Aboriginal water holders. We then ran title searches to obtain details about the water entitlements for the 2020 baseline.

The ideal approach to searching title registers is presented in Figure 6. In summary, an *owner name search* for all identified (possible) entitlement holders should be run. Then, for each water entitlement revealed though an owner name search, a *title search* would be run to collect key information about those entitlements (e.g. volume of entitlement, water source, date of issue, etc.). Each State and Territory, however, has different title and register search options and capabilities, which necessitated deviation from this method.

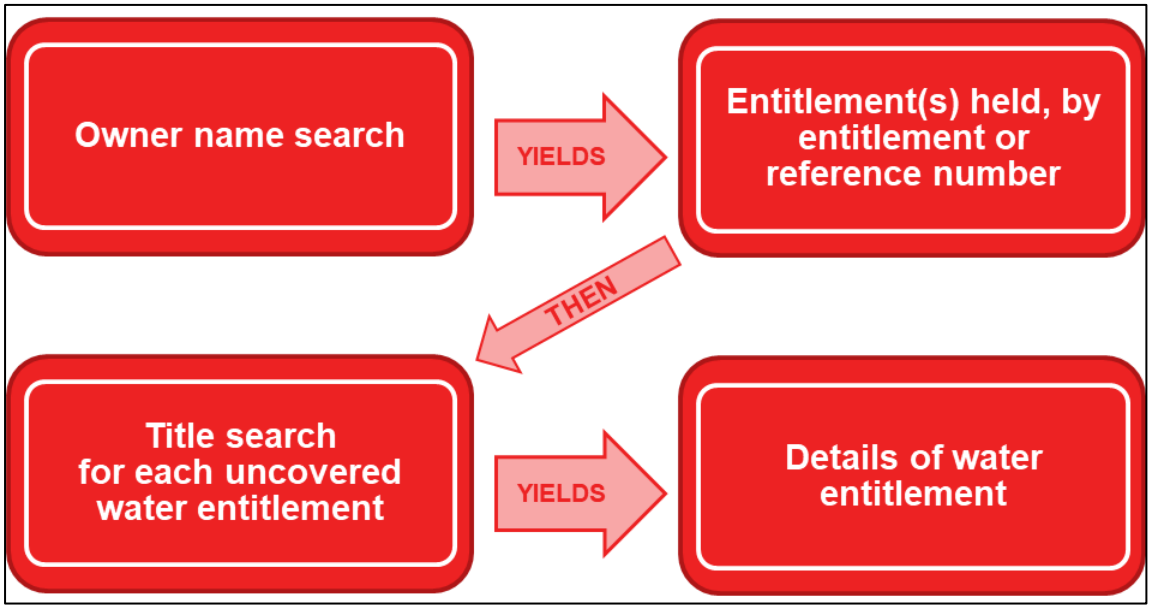


Figure 6: Ideal title register search approach for identifying Aboriginal held entitlements

Hartwig completed this exercise for the NSW portion of the MDB in October 2018 (Hartwig, 2020; Hartwig et al., 2020). To avoid duplicating this effort, while still uncovering any changes to Aboriginal water holdings since then, we used the NSW Government's free online register ("NSW Water

[14] For example, some former water licences issued under the *Water Act 1912* (NSW), were not converted to current aquifer water access licences under the *Water Management Act 2000* (NSW). In some cases, this is because the water access permitted under the former licensing framework was for stock and/or domestic purposes, which under the new regime is considered basic landholder rights and so an entitlement to take water is not required (s 52, *Water Management Act 2000*) (see also NSW Department of Primary Industries, 2015).

Register", searches entitlement number only) to locate any permanent transfers of entitlements in the 2018 baseline. Any such changes then triggered further searches.

Victoria and South Australia currently do not offer owner name search functions in their water registers. This means, to search for water entitlement data, one must have the entitlement reference number. While sourcing this information is not impossible, it is difficult and can depend on the knowledge and cooperation of State agency staff and individual Aboriginal organisations (Altman & Arthur, 2009; Arthur, 2010). To overcome this challenge, we sought assistance from the relevant State agency staff who may have access to greater search functions. The SA Government staff were able to facilitate these owner-name based searches internally. Due to privacy policies, the Victorian Government was not able to provide the results of such searches in the detail and format required for consistent analysis and comparison with other jurisdictions. We also made several attempts to contact the ILSC to gain greater clarity about its water holdings, but received no response.

The overall approach to identifying Aboriginal held water entitlements was as thorough as possible. We still may have missed a very small number of entitlements and/or organisations because there is no systematic way to easily identify Aboriginal-held water entitlements in any individual State or Territory jurisdiction.

Standardising Aboriginal held water entitlements for comparison: Surface water

There are over 150 different surface water entitlements in the MDB (NSW Department of Industry, 2018b), and each water entitlement for each water source yields different average usable water volumes, even for the same level of entitlement reliability. A number of reasons account for this variability, including (but not limited to) regional differences in water availability (which affects the amount of water allocated to entitlements) and water storage infrastructure (which affects the opportunity for carrying over water allocations between years). Comparisons of different water entitlements are therefore difficult.

To manage these variations and inconsistencies, and following advice from the MDBA, we followed an approach used by the MDBA and Basin States to estimate and account for environmental water recovery as a means to "standardise" across Aboriginal-held water entitlements. The MDBA and Basin States developed long-term diversion limit equivalence (LTDLE) factors (often colloquially called "cap factors") which, when applied to water entitlements, allows different types of entitlements within and across water sources to be compared on equal terms (NSW Department of Industry, 2018b). LTDLE factors range from 0 to 1 (or 0% to 100%), with a high value indicating greater long-term average water usage. An entitlement could have a LTDLE of 80%, or even as low as 20%, depending on the entitlement type and the water source. This means that available and usable volumes are usually less (sometimes significantly so) than the issued entitlement volumes (Wentworth Group of Concerned Scientists, 2010).

Basin States first developed LTDLE factors in 2011. In 2015, Basin Ministers agreed to review and update these to produce a more consistent and standardised approach. The NSW Government's updated LTDLE factors were published in 2018 and finalised in early 2019 (see NSW Department of Industry, 2018b, 2019a, 2019b). The updated Victorian and South Australian LTDLE factors were released in late 2019 (SA DEW, 2019; Victoria DELWP, 2019). It is understood that at the time of writing, Queensland's revised LTDLE factors are close to being settled, while in the ACT, no water has been recovered for environmental use, so such factors are not required (Tony McLeod, General Manager, SDL Accounting and Aboriginal Partnerships Branch, Water Resource Planning and Accounting Division, MDBA, *pers comm*, 13 July 2020). The updated 2018 and 2019 LTDLE factors were used in this exercise.

Importantly, these LTDLE factors do not dictate water use, nor inform water allocation decisions. Instead, they are intended to be a tool for representing historic water access and use in a consistent manner across all water entitlement types, water sources and jurisdictions (NSW Department of Industry, 2018b). Applying this method to Aboriginal water holdings is, therefore, expected to be of long-term value because it provides an accessible means of monitoring changes to these water holdings from this point forwards in a way that is consistent and compatible with new water accounting methods for the Basin.

LTDLE factors have only been developed, however, for entitlement types that have been, or are proposed to be, recovered for the environment (through direct purchases or water savings infrastructure projects) (SA DEW, 2019). This has often not included unregulated entitlements. For unregulated entitlements held by Aboriginal organisations without established LTDLE factors in NSW, we followed the assumptions of NSW Department of Industry (2018b), which nominated a LTDLE factor of 1.000 for unregulated entitlement types that have been recovered for environmental use. This assumption is deemed appropriate because only a very small volume of unregulated water has been recovered for environmental use, and so "the associated factors don't significantly affect the overall water recovery balance" (NSW Department of Industry, 2018a, p. 1).

LTDLE factors were applied to each identified Aboriginal-held water entitlement, and subsequent LTDLE-volumes or what we term "standardised volumes" were recorded for each entitlement and SDL resource unit. Table 1 demonstrates the application of the LTDLE factors to Aboriginal-held water entitlements using the NSW Murray as an example. Throughout this report, we distinguish "standardised" surface water volumes as volumes per year (e.g. ML/y or GL/y).

Table 1: Applying LTDLE factors to Aboriginal water holdings in the NSW Murray SDL resource unit

NSW Murray Entitlements	Entitlement shares (ML)	LTDLE volumes (ML/y) ([total shares] * [LTDLE factor])
Stock & Domestic	42	42 * 0.623
High Security	8	8 * 0.873
General Security	5,588	5,588 * 0.699
Supplementary	258	258 * 0.703
Unregulated	104	104 * 1.000
Total	**6,000**	**4,225**

Source: Compiled from NSW Department of Industry (2018b), with assistance from Dr Marcus Finn, Senior Director of Water Resource Plans and Basin Policy at MDBA

We then compared LTDLE volumes for Aboriginal-held water entitlements with equivalent and comparable measures. The equivalent and comparable measures for surface water were environmental water recovery, BDL and SDL[15] volumes. The MDBA developed BDLs and SDLs for each surface water SDL resource unit area by considering and estimating the LTDLE of water within seven forms of surface water "take", using the best available information (MDBA, 2019c, 2019d). As this report focuses on Aboriginal-held water rights and access managed through State- and Territory-issued water entitlements, only equivalent forms of take were used to estimate these comparative measures ("take from a regulated river" and "take from a watercourse"). These equivalent and

[15] SDLs were set to become the benchmark for consumptive water use from 1st July 2019, but there have been delays in some Basin States. Once SDLs do come into force, consumptive water use in each valley will be allowed up to the SDL, rather than the BDL. For surface water, SDLs are lower than BDLs and, therefore, it is worth considering Aboriginal water holdings as a proportion of not only BDLs but also the SDLs, where appropriate.

comparable volumes for recovered water (for environmental uses), BDLs and SDLs are listed in Appendix B.

Finally, while it is possible to convert a previous water entitlement baseline to LTDLE volumes,[16] the previous baseline must be comprehensive. Some information was missing from Altman and Arthur's 2009 baseline for some jurisdictions, making such a conversion and then comparison difficult across the Basin. Limitations to water registers that make identifying changes to water entitlements over time also make verifying this baseline (or developing another) difficult. Issues relating to water registers are discussed further in Section 5. A complete list of limitations and assumptions underpinning this standardisation method and application of LTDLE factors is outlined in Appendix E.

Standardising Aboriginal held water entitlements for comparison: Groundwater

The method used for standardising surface water entitlements is not transferrable to the groundwater context. This is due to the static nature of BDLs and SDLs in groundwater (unlike surface water, which are dynamic), and that in all but two groundwater SDL resource units, the BDL is less than or equal to the SDL (see Schedule 4, *Basin Plan 2012*). LTDLE factors have been developed for only two groundwater SDL resource units where water recovery was required (MDBA, 2020b).

As a first step to standardising the Aboriginal-held groundwater water entitlements for, the MDBA suggested that groundwater entitlements across water sources across the Basin can be summed on a one-for-one basis, without needing to apply a conversion factor (like LTDLEs was used for surface water). This assumption means that the volumetric groundwater results cannot be combined with surface water holdings to provide an overall Aboriginal water holdings volumetric or proportional estimates across all MDB water sources. Indeed, combining surface water and groundwater volumes in this way is an uncommon practice in management of the Basin with both the MDBA and Bureau of Meteorology publishing annual accounts listing each water resource separately (see, for example, BOM, 2019b; MDBA 2019f).

We then needed to determine the correct baseline parameter for making proportional comparisons. The MDBA advised against comparing groundwater holding volumes with BDLs because BDLs were set using a different methodology for different SDL resource units and were only used to inform water recovery targets. Therefore, BDLS were not a suitable baseline parameter.

We next assessed the suitability of using groundwater SDLs as the baseline parameter. Unlike surface water, current groundwater users' requirements (including licensed volumes and water to meet basic landholder rights) are in many cases lower than the SDL. Water that is not currently assigned to any entitlement holder/s on a permanent basis in these groundwater systems is called "unassigned water" (NSW Department of Primary Industry – Water, 2017).

Not all Basin States have made all of this unassigned water available for use. For some SDL resource units, Basin States have made a portion available, though retain the ability to increase this up to the SDL should there be greater demand (see, for example, NSW Department of Primary Industry – Water, 2017). In some groundwater sources, then, the SDL represents what *may* be available in the future[17] with respect to a potential growth in use rather than what is *actually* available for use now. Therefore, groundwater SDLs are not an accurate or appropriate indicator for an available resource baseline in all circumstances.

[16] Some workarounds and fixes are required. See Hartwig (2020).

[17] The potential opportunities (and challenges) this may present First Nations are discussed in Section 5.

So, as an alternative baseline parameter option, we considered using total volume of water access entitlements (WAE) on issue plus estimated take under basic rights (BR), both based on 2018-19 water year data. The total volume of WAE on issue is calculated by adding the volume of all entitlements to a given groundwater source on issue in a given water year. Take under BR is water that can be taken without an entitlement under State legislation. All Basin States have their own method of estimating annual take under BR.

We determined, however, that the total volume of WAE plus BR can exceed the SDL for some groundwater sources. Where this is the case, the total volume of WAE plus BR inaccurately suggests that more water is available than the SDL.[18] Therefore, the total volume of WAE plus BR is not always an appropriate available resource baseline parameter.

As neither SDL nor the total volume of WAE plus BR are an accurate or appropriate baseline measure in all groundwater cases, we developed a tailored baseline measure termed *available groundwater resource*. The available groundwater resource is calculated based on the following considerations:

1. Where the total volume of WAE plus BR is less than or equal to the SDL, we can assume that the total volume of WAE plus BR is a good measure of the available groundwater resource. A comparison ratio of 1 is applied in these circumstances.
2. Where the total volume of WAE plus BR is greater than the SDL, the SDL is the better measure of the available groundwater resource. Therefore, we must scale back the total volume of WAE plus BR to equal the SDL, and in doing so, determine a comparison ratio (<1).

Comparison ratios were then applied to the total volume of identified Aboriginal groundwater holdings for the relevant water management area to determine the *comparable volume of Aboriginal groundwater entitlements* (see Appendix C). Where a comparison ratio of 1 is applied, the volumetric units remain unaltered. Where a comparison ratio of less than 1 is applied, however, the result will not be equivalent in volumetric terms nor, therefore, comparable to estimated volumes for other water management units at the same scale. In these instances, it is more appropriate to compare the calculated proportion or share (i.e. percentage) of available groundwater resources.

Development of comparison ratios in this way is based on the assumption that all groundwater entitlement holders utilise all of their available water every year, but this has not been observed in user behaviour in the past. For example, there are many “sleeper” groundwater entitlements which are entitlements that are not regularly accessed. Additionally, groundwater entitlement holders rarely use their full allocations. This means that even where the total volume of WAE plus BR exceed the SDL, users have not had allocations below 100%. This is observable in actual water use data published by the MDBA (2019f) and BOM (2019b).

The SDL, WAE, BR, and WAE + BR volumetric estimates (using 2018-19 water year data) along with the developed comparison ratio and calculated available groundwater resource for each water management area examined are presented in Appendix C.

Analysis and reporting

Several limitations pertaining to changing geographies limit the extent to which we have been able to compare the data presented in this report with previous analyses. First, different authors have

[18] We note that such a situation is possible because (a) SDL is a *long-term* average measure that reflects take; (b) annual groundwater take is often considerably less than the volume of water allocated (and that on entitlement); and, (c) where the groundwater take does exceed the SDL, Basin States have compliance measures to rectify and manage the exceedance. In NSW, for example, if the long-term average annual extraction limit compliance test (established in Water Sharing Plans, which form part of NSW WRPs) is exceeded, initial water allocations in the next water year to aquifer entitlements may be less than 100%.

used different geographic units to estimate population figures. For example, the geographic units used by Taylor and Biddle (2004) are considerably different to those used by ABS et al. (2009). This could be due to changes to the way that Census data is now collected and reported. These inconsistencies can help to explain some unexpected trends noted in temporal comparisons (see, for example, Table 3 in Section 4).

Second, water management units within the MDB have changed over time, including during the last decade. Despite some similarities, the previously used Sustainable Yield Regions for surface water management for example, differ quite significantly overall from currently used SDL resource units. Thus, data reported here against SDL resource units is not comparable with that reported in publications that use Sustainable Yield Regions (see ABS et al., 2009; Arthur, 2010).

A scaffolding approach is used to present all baseline data in Appendix A (population data), Appendix B (surface water holdings), and Appendix C (groundwater holdings). The intention of this is to maximise the utility of the data for all potential users who may want information at different scales (e.g. MDBA, Basin State agencies, MLDRIN, NBAN, other Traditional Owner representative groups, other researchers, etc.). Figure 7 below uses Queensland water management units to show the scaffolding levels used to present the population data and surface water holdings. Northern and Southern Basins are defined according to that shown earlier in Figure 2.

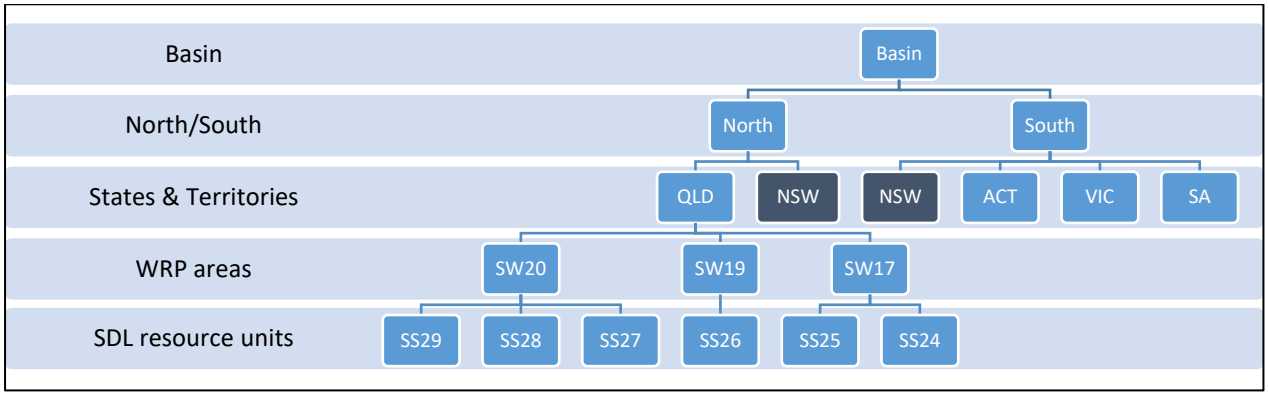


Figure 7: Scaffolding approach used to present population in Appendix A and surface water baseline data in Appendix B

Figure 8 below shows the scaffolding levels used to present groundwater holdings in Appendix C, again using Queensland water sources as an example. With so few Aboriginal entities with groundwater entitlements identified, it was decided to not present Aboriginal groundwater holding data at the SDL resource unit scale to protect confidentiality.

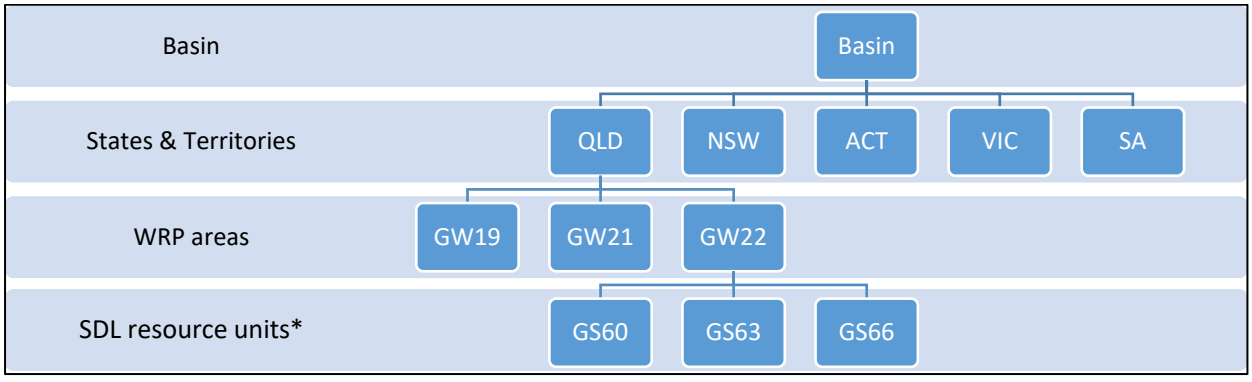


Figure 8: Scaffolding approach used to present groundwater baseline data in Appendix C

Note: *For the SDL resource unit level, Aboriginal groundwater holding data is not presented in the interest of confidentiality, and only SDL, total volume of water entitlement on issue plus basic rights, comparison ratio, and available groundwater resource are presented for that level.

4. Findings

Indigenous population

Population findings are presented from the largest (Basin-wide) to smallest scale (surface water[19] SDL resource units) using 2016 ERP data. Population changes over time are discussed where possible, but the extent is limited by the number of historic analyses, as well as issues previously discussed. Indigenous[20] population figures and total population figures by SDL resource unit, WRP area, State and Territory portion, and Basin are presented in Appendix A.

Basin-wide

Our analysis shows that in 2016, the Indigenous ERP in the MDB was 120,487, representing 5.3% of the total MDB population (2,252,123 persons), as shown in Table 2. Over half of this MDB Indigenous population live within the Northern Basin (64,739 Indigenous persons). In this region, Indigenous peoples also constitute 10.5% of the total ERP in this area. By contrast, 46.3% of the total MDB Indigenous population live in the Southern Basin (55,748 Indigenous persons). Here, Indigenous people constitute a 3.4% share of the total ERP. In other words, a greater proportion of the Basin's total Indigenous population lives in the north of the Basin where the Indigenous share of the population is more than three times that of the south.

Table 2: Indigenous and non-Indigenous ERPs of the MDB, 2016

Region	Indigenous ERP	Non-Indigenous ERP	Total ERP
Total Murray-Darling Basin	120,487	2,131,636	2,252,123
Northern Basin	*64,739*	*554,325*	*619,064*
Southern Basin	*55,748*	*1,577,311*	*1,633,059*

Overall, the total 2016 MDB Indigenous population constitutes a 15.1% share of the total national Indigenous population (798,333 Indigenous persons). By comparison, the total MDB population (2,252,123 persons) constitutes 9.0% of the total national population (24,190,581 persons).

In 2004, Taylor and Biddle offered preliminary MDB Indigenous population projections for 2016. While their methods were underpinned by a number of assumptions and limitations (see Taylor & Biddle, 2004), contrasting these projections with the actual 2016 ERP figures is an interesting exercise. Their low series estimate, which was based on demographic factors alone, was 84,543 Indigenous persons following a modest 1.5% per annum growth rate. However, as noted earlier, other non-demographic factors commonly see higher than expected intercensal population growth for Indigenous population in Australia (see Taylor & Biddle 2004, 2010).[21] Taylor and Biddle's (2004) high series estimate, which accounted for these other non-demographic factors, predicted a very high growth rate of 4.6% per annum, culminating in a 2016 Indigenous population projection of 116,551. Given the considerable uncertainty of these estimates, Taylor and Biddle (2004) predicted that the 2016 Aboriginal MDB population would be somewhere between the two estimates. Analysis

[19] All references to SDL resource units and WRP areas in the Indigenous population findings section are surface water management units.
[20] A reminder: we reserve the use of the term "Indigenous peoples/persons" for when describing Census population and demographic statistical information, which combines those people that identify as having Aboriginal and/or Torres Strait Islander origin.
[21] Non-demographic factors contributing to this intercensal change include changes in the ways that respondents identifying themselves as being of Aboriginal and/or Torres Strait Islander in Census surveys, identification of children from mixed Indigenous-non-Indigenous partnerships identifying as Indigenous and improving Census methodologies (See Markham & Biddle, 2018).

here, though, shows the Indigenous ERP from the 2016 Census (120,487) in fact exceeds their high series estimate by close to 4,000 people.

Based on the 2016 population figures presented already and those from previous analyses (see Table 3), from 2001 to 2016 the total Indigenous population in the MDB increased by an estimated 43% or 2.8% per annum averaged over this time.[22] This rate of growth is more than five times greater than the non-Indigenous population rate, which was estimated to be 8.0% or 0.5% per annum over the same period. Taylor and Biddle (2004) reported a similar relationship between Indigenous and non-Indigenous population growth rates from 1996 to 2001. As a result of this sustained comparatively higher Indigenous population growth rate, the Indigenous share of the total MDB population has increased from 3.4% in 2001 (Taylor & Biddle, 2004) to 5.3% in 2016. Should these Indigenous and non-Indigenous population growth and migration trends continue, the Indigenous share of the total MDB population is only likely to continue to grow into the future. Hartwig et al. (In review) estimate, for example, that if recent growth trends are extrapolated to 2031, Indigenous peoples could constitute over 16% of the total population in the NSW portion of the MDB.

Table 3: Indigenous and non-Indigenous ERPs of the MDB as reported in different sources from 2001 to 2011

Census year (relevant analysis citation)	Indigenous population	Non-Indigenous population	Total population
2011 (Wentworth Scientists, 2017)	84,015	2,016,518	2,100,533
2006 (ABS et al., 2009)	69,481	2,020,294	2,089,775
2001 (Taylor & Biddle, 2004)	68,656	1,960,099	2,028,755

Note: Considerably different statistical scales of analysis were used by Taylor and Biddle (2004) and ABS et al. (2009).

State and Territory portions of the MDB

Figure 9 shows the current distribution of the Indigenous population across the portions of State and Territory jurisdictions that fall within the Basin, using 2016 ERP data. The largest proportion of the Basin's Indigenous population resides in NSW (65.1%), where Indigenous peoples constitute a 9.3% share of the total population. Similar sized Indigenous populations live in the Victoria-MDB portion (15,481 Indigenous persons and 12.8% of total) and Queensland-MDB portion (14,910 Indigenous persons and 12.4% of total), but the Indigenous share of the Queensland-MDB total population (6.0%) is greater compared to the Victorian-MDB (2.4%). The ACT has the fourth largest Indigenous population (7,456 Indigenous persons and 6.2% of total), followed by South Australia (4,162 Indigenous persons and 3.5% of total).

[22] We acknowledge that the units of analysis may not align between our 2016 data analysis and Taylor and Biddle's 2001 data analysis.

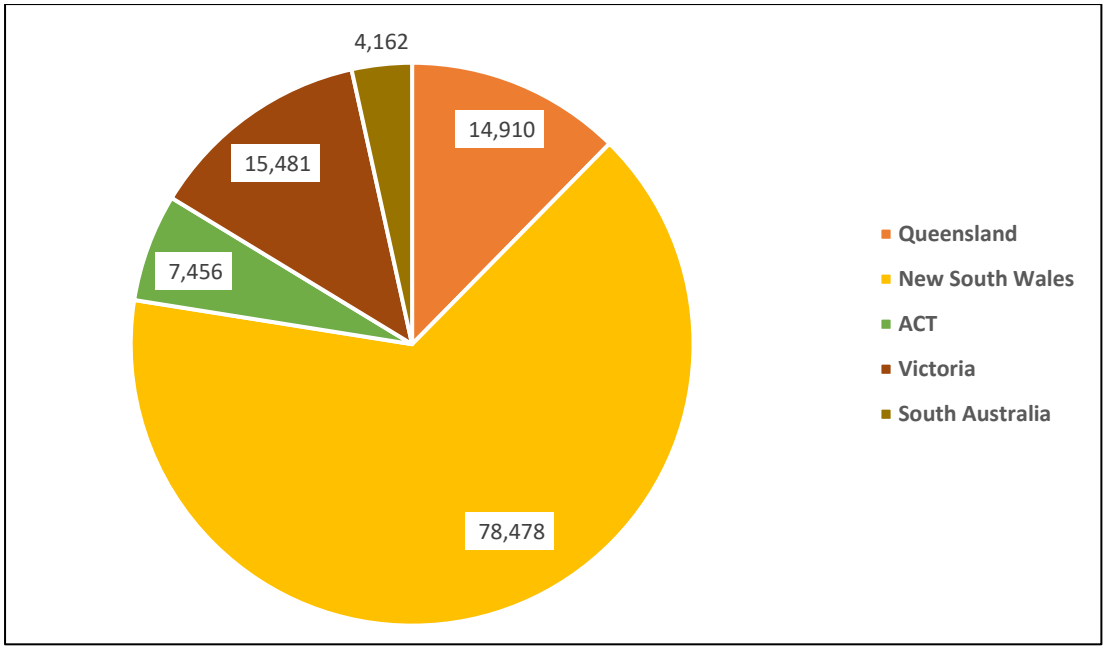


Figure 9: Distribution of total MDB Indigenous population by State and Territory MDB portions, 2016 ERP data

Taylor and Biddle (2004) provided similar State and Territory based Indigenous population estimates using 2001 Census data. Their findings are summarised alongside 2016 ERP statistics in Table 4. While the proportional distribution of Indigenous persons across the State and Territory jurisdictions in 2016 is similar compared with 2001, the total number of individuals has increased considerably. Of note, in 2016 the NSW portion of the MDB was home to more Indigenous peoples by number (78,478 Indigenous persons) than there were estimated across the whole MDB in 2001 (68,656 Indigenous persons). Figure 10 graphically represents the change in Indigenous population by State and Territory jurisdictions over time.

Table 4: Indigenous and total population distribution across State and Territory portions of the MDB, 2001 and 2016

Region	Indigenous population		Total population		Spatial distribution of total MDB Indigenous population (%)		Indigenous proportion of total population for specified area (%)	
	2001	2016	2001	2016	2001	2016	2001	2016
Total	68,656	120,487	2,028,755	2,252,123	100	100	3.4	5.3
NSW	45,781	78,478	809,153	841,371	66.7	65.1	5.7	9.3
Queensland	9,067	14,910	235,780	248,004	13.2	12.4	3.8	6
Victoria	7,839	15,481	595,948	634,508	11.4	12.8	1.3	2.4
SA	5,969	4,162	387,874	125,656	8.7	3.5	1.5	3.3
ACT		7,456		402,584		6.2		1.9

Note: Taylor and Biddle (2004) do not separate SA and ACT population figures. 2001 and 2016 units of analysis may not perfectly align.

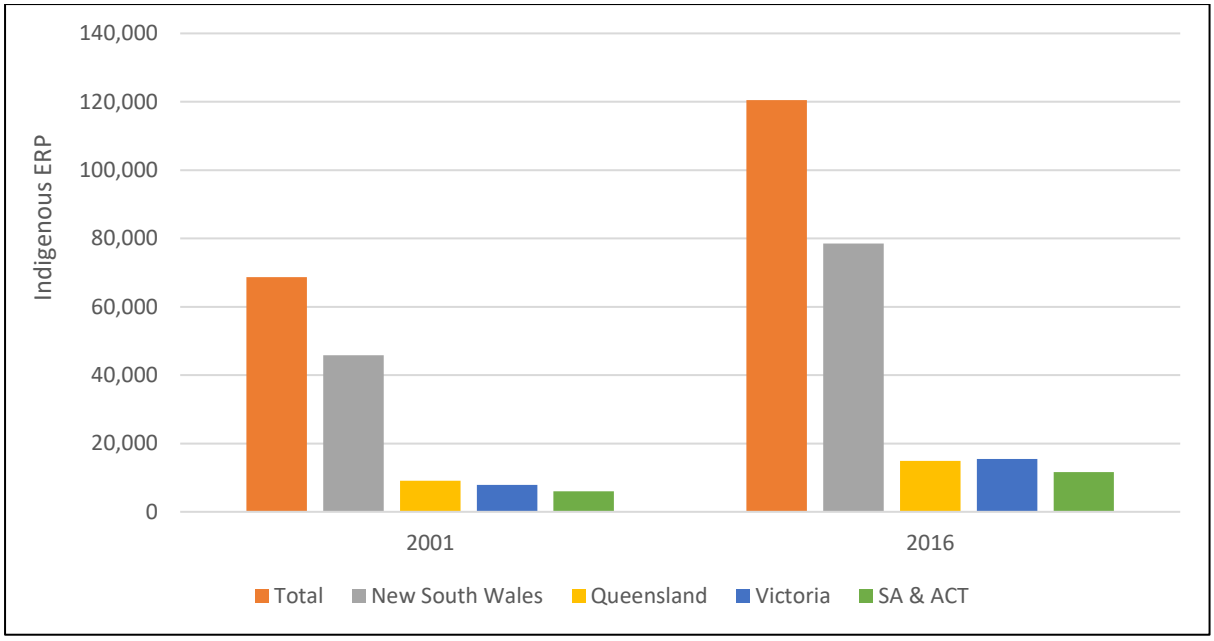


Figure 10: Indigenous ERP by State and Territory portions of the MDB, 2001 and 2016

Note: Taylor and Biddle (2004) do not separate SA and ACT population figures. 2001 and 2016 units of analysis may not perfectly align.

SDL resource units

Table 5 presents key population statistics by SDL resource unit, ordered from largest to smallest Indigenous population. As noted earlier, the Barwon-Darling Watercourse SDL resource unit (and WRP area) only includes the watercourse i.e. the river channel, and not any adjacent areas—and therefore not the adjacent townships (see Figure 1 earlier). Populations that live along or adjacent to this SDL resource unit are therefore captured in the population estimates for neighbouring SDL resource units—predominantly Intersecting Streams, but also the Lower Darling, Macquarie-Castlereagh, Gwydir, and NSW Border Rivers SDL resource units. Readers should not interpret this to mean that no (Indigenous or non-Indigenous) people live along the Barwon-Darling Watercourse.

Interestingly, Table 5 shows that more than half (54.5%) of the MDB Indigenous population live in only four SDL resource unit areas, three of which are located in NSW. More specifically, the Macquarie-Castlereagh SDL resource unit had the largest Indigenous ERP in 2016, with 25,524 Indigenous persons representing 21.2% of all Indigenous persons in the MDB. The Namoi and Murrumbidgee SDL resource units had the second and third largest number of Indigenous persons (13,804 and 13,778, respectively). Condamine-Balonne, in Queensland, has the fourth largest Indigenous population with 12,478 Indigenous persons.

Table 5: Key ERP statistics across the MDB by SDL resource unit in order of Indigenous population size

SDL resource unit	State	Indigenous ERP	Total ERP	Proportion of total MDB Indigenous population (%) [See Figure 11]	Indigenous population as proportion of total SDL resource unit population (%) [See Figure 12]
Macquarie-Castlereagh	NSW	25,542	206,042	21.2	12.4
Namoi	NSW	13,804	98,352	11.5	14.0
Murrumbidgee	NSW	13,778	248,170	11.4	5.6
Condamine–Balonne	Qld	12,478	216,875	10.4	5.8
Lachlan	NSW	8,051	96,223	6.7	8.4
ACT (surface water)	ACT	7,456	402,584	6.2	1.9
Victorian Murray	Vic	4,248	112,235	3.5	3.8
Gwydir	NSW	4,017	24,810	3.3	16.2
Goulburn	Vic	3,987	138,997	3.3	2.9
Lower Darling	NSW	3,530	27,854	2.9	12.7
NSW Border Rivers	NSW	3,447	30,951	2.9	11.1
NSW Murray	NSW	3,290	98,064	2.7	3.4
Intersecting Streams	NSW	3,019	10,905	2.5	27.7
Loddon	Vic	2,863	47,811	2.4	1.9
SA Non-Prescribed Areas	SA	2,794	63,836	2.3	4.4
Kiewa	Vic	1,284	47,875	1.1	2.7
Eastern Mount Lofty Ranges	SA	1,163	52,848	1.0	2.2
Warrego	Qld	1,138	5,869	0.9	19.4
Queensland Border Rivers	Qld	1,133	23,010	0.9	4.9
Wimmera-Mallee	Vic	1,106	63,491	0.9	1.7
Campaspe	Vic	956	55,911	0.8	1.7
Ovens	Vic	709	49,996	0.6	1.4
Broken	Vic	328	18,192	0.3	1.8
SA Murray	SA	192	7,519	0.2	2.6
Moonie	Qld	69	888	0.1	7.8
Nebine	Qld	68	1,095	0.1	6.2
Paroo	Qld	24	267	0.0	9.0
Marne Saunders	SA	13	1,453	0.0	0.9
Barwon-Darling Watercourse*	NSW	n/a	n/a	n/a	n/a

Note: *The Barwon-Darling Watercourse SDL resource unit only includes the watercourse i.e. the river channel, where no one lives.

Figure 11 shows the spatial distribution of the total MDB Indigenous population i.e. in what regions Indigenous populations live. The SDL resource units where Indigenous people live in the greatest numbers are shaded in darkest orange. The larger number of Indigenous peoples identified in these areas is likely due in part to each encompassing one or more sizable populous townships. For example, Dubbo and Orange in Macquarie-Castlereagh, Tamworth and Walgett in Namoi, Wagga Wagga and Griffith in Murrumbidgee, and Toowoomba in Condamine-Balonne. This map does not include information about non-Indigenous populations.

Figure 11: Spatial distribution of the MDB Indigenous population (as a proportion of the total MDB Indigenous population) by SDL resource unit, based on 2016 ERP

Figure 12 presents the Indigenous population as a proportion of total population (that is Indigenous and non-Indigenous) for each SDL resource unit (see last column in Table 5). Darker green shading in this figure indicates areas where Indigenous peoples constitute a larger proportion of the total SDL resource unit population. The three SDL resource units with the highest Indigenous population as a proportion of the total population were Intersecting Streams (27.7%), Warrego (19.4%), and Gwydir (16.2%).

Figure 12 shows that the Northern Basin and/or more remote areas generally have populations with higher proportions of Indigenous people. This finding is consistent with past research (see ABS et al., 2009; Taylor & Biddle, 2004).

One particular strength we see from this graphic is that it clearly demonstrates that Indigenous peoples constitute at least 5% of most SDL resource unit populations in Queensland and NSW. Indeed, Indigenous peoples constitute more than 10% of the total population in six of the nine populated[23] NSW SDL resource units. These are significant observations that do not seem to be well appreciated in water management and broader policy and planning circles.

On the other end of the spectrum, this figure also shows that Indigenous persons make up less than 5% of the total population in most Victorian and SA SDL resource units, and less than 1% in only one SDL resource unit (Marne Saunders, near Murray Bridge in SA). In interpreting this, it is crucial to remember that the combined Indigenous populations of the Victorian and SA SDL resource units represents 16.3% of the total MDB Indigenous population. This shows how it is possible that in these more southern areas, Indigenous populations (and Aboriginal water issues, priorities, and goals) may be more easily over-shadowed by the interests of the much larger non-Indigenous populations.

[23] As noted, Barwon-Darling Watercourse SDL resource unit is not considered populated due to only containing the river channel.

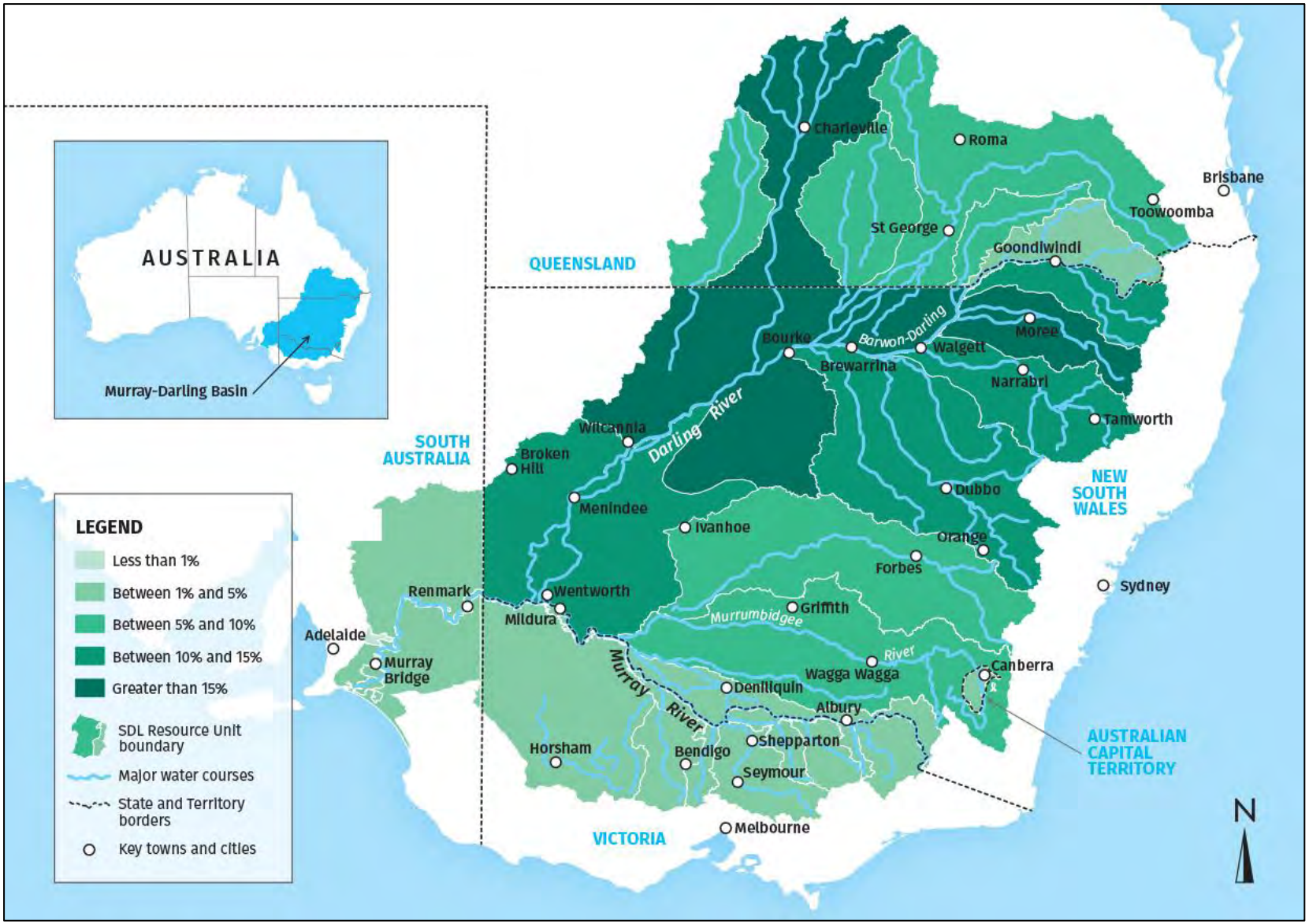


Figure 12: Indigenous proportion of the total population in each SDL resource unit, based on 2016 ERP

We note that these figures may give the impression that the Indigenous population is distributed evenly within individual SDL resource units. In reality, populations are generally concentrated in towns or settlements. Hartwig et al. (In review) show that townships and settlements in the NSW portion of the MDB are generally located adjacent to rivers. This is particularly the case for settlements with high Indigenous population proportions, such as in Western NSW. Even in the most sparsely settled parts of NSW, Indigenous populations continue to occupy riverside towns and communities with declining non-Indigenous populations (Hartwig et al. In review).

Aboriginal water holdings: Surface water

In this section, we describe identified surface water entitlements that are held by Aboriginal organisations[24] and their spatial distribution at Basin, State and SDL resource unit scales. Commentary about Aboriginal-held water entitlements in each jurisdiction is offered, including possible reasons that led to the acquisition of entitlements by Aboriginal entities. Next, the composition of entitlement types held by Aboriginal entities is examined. This provides insights into the reliability of water access and the market value of the entitlements. To conclude, we briefly compare water recovered for environmental purposes with Aboriginal-held water, and then, looking to the very near-future, present Aboriginal water holdings as proportions of SDLs.

The Victorian Government provided a high-level summary of water holdings held by Traditional Owners in Victoria, however this data could not be converted to LTDLE volumes. As detailed earlier, this format is necessary for consistent analysis and comparison with other jurisdictions. As a result, Victoria is excluded from some aggregate figures presented in the following discussion. Where possible, we make comment on Aboriginal-held Victorian water entitlements based on other anecdotal evidence such as from conversations with Victorian agency staff and data presented in ACCC's (2020) Interim Report from its ongoing MDB Water Market Inquiry.

Spatial distribution and character of identified Aboriginal surface water holdings in the MDB

Across the MDB, we found that at least[25] 30 Aboriginal entities hold surface water entitlements to 12.774 GL/y of water under 64 water entitlements.[26] The LTDLE volumes of individual entitlements range from 0 ML/y[27] to 1,858 ML/y[28]. These Aboriginal water holdings constitute a mere 0.17% of the equivalent take BDL in the corresponding Basin States only (i.e. excluding Victoria's equivalent take BDL), or 0.12% of the whole Basin's equivalent take BDL (i.e. including Victoria's equivalent take BDL). If we also account for Aboriginal water holdings in the Victorian portion of the Basin,[29] we expect that Basin-wide Aboriginal water holdings would altogether, as a very generous estimate, constitute only up to 0.17% of the whole Basin's equivalent take BDL.

This figure of 0.17% is slightly larger than other estimates of Aboriginal water holdings to date. Jackson and Langton's (2012) often-cited figure of "less than 0.01%" is much smaller because it only concerns "Indigenous-specific water entitlements", whereas our analysis here includes all entitlements that are held by Aboriginal entities. (We return to "Indigenous-specific water entitlements" again shortly.) In 2015, MLDRIN chair Darren Perry estimated Aboriginal water holdings constituted 0.08% of the Basin's SDL. While the method used to calculate this figure was

[24] As a reminder, there is no available data about water entitlements that are held by Aboriginal individuals.

[25] While Aboriginal water holdings in Victoria are uncounted, we leave open the possibility of a higher total.

[26] Five of these entitlements include two parts. One entitlement is held by multiple holders, and so for that entitlement, the Aboriginal entity is only a part holder.

[27] Two entitlements are for 0 ML/y. Such an entitlement grants the owner no ongoing volumetric water right but is typically used to facilitate purchasing temporary water allocations or permanent share components.

[28] This largest entitlement is held by the ILSC and is pledged to be transferred to an Aboriginal organisation.

[29] By drawing on anecdotal evidence such as from conversations with Victorian agency staff and data presented in ACCC (2020).

not outlined by Perry (2015), he drew from Arthur's (2010) data that, to some extent, adds different entitlement shares together. As noted in Section 3 of this report, this is not advisable. What is consistent across these different estimates, however, is that Aboriginal water holdings are miniscule as a proportion of the total pool of available water.

As shown in Table 6, the largest volume of water held by Aboriginal entities in the MDB is located in the NSW portion (93.9% or 11.992 GL/y), followed by the SA portion (6.1% or 0.782 GL/y). No Aboriginal water holdings were identified in Queensland or the ACT.

Table 6: Distribution of Aboriginal water holdings across the State and Territory portions of the MDB

Area	LTDLE water held (GL/y)	Portion of all Aboriginal-held water (%)	As a share of the equivalent BDL for the area (%)
Queensland	0	0	0
NSW	11.992	93.9	0.21
ACT	0	0	0
Victoria	Data unavailable	Data unavailable	Data unavailable
South Australia	0.782	6.1	0.11
Total Basin (inc Vic)	**12.774**	**100**	**0.12**
Total Basin (exc Vic)	**12.774**	**100**	**0.17**

Note: BDL figures are included in Appendix B.

Before progressing to examine the distribution and character of Aboriginal water holdings at these State and Territory jurisdictional scales, we pause to highlight the degree of underrepresentation of Aboriginal water rights in the MDB as revealed through contrasting Aboriginal water holdings (as a proportion of total water holdings) with the earlier described Indigenous population estimates (as a proportion of total populations). Importantly, in doing, we do not imply that parity of population and water holdings should be *the* measure of equity or fair water distribution in the Basin either now or in the future. Instead, we see such a parity as one among many possible forms and indeed, one that is certainly open to discussion. Ultimately, measures of equity need to be informed by and determined with Traditional Owners (Hartwig et al., 2020).

In the interim, we include this exercise to develop and offer important insights about the degree of underrepresentation and inequity of Aboriginal water rights in the MDB. While the following insights are useful and important, they are *indicative* only and should not be interpreted or treated otherwise.

Across the whole Basin (excluding Victoria), Indigenous peoples represent 6.5% of the total population. By comparison, Aboriginal entities hold 0.17% of the available surface water, as shown in Table 7. When looking regionally across the Northern and Southern Basins (excluding Victoria), an even more concentrated disparity is revealed. As displayed in Table 7, in the Northern Basin, Aboriginal peoples constitute a larger proportion of the total population (10.5%, compared to 4.0% in the south) and of the total MDB Aboriginal population (61.7%, compared to 38.3% in the south). Yet, Aboriginal entities in the Northern Basin hold a smaller fraction of available water (0.11%, compared to 0.21% in the south). As the later section shows, the main types of water entitlements that Aboriginal entities hold—especially in the Northern Basin—further amplifies this under-representation.

In sum, using this water to population proportion exercise as an indicative measure of water equity reveals first and foremost that Aboriginal water access across the *whole* Basin is inadequate and

inequitable. Secondarily, it indicates that this disparity is particularly concentrated in the Northern Basin.

Table 7: Population and water distributions across the Northern and Southern Basins

Category	North		South*		Total*
	Number	Percent	Number	Percent	
Total water (GL/y)	2,416	32.9%	4,921	37.1%	7,337
Aboriginal-held water (GL/y)	2.684	21.0%	10.090	79.0%	12.774
Aboriginal-held water as a proportion of total water (2020)	**-**	**0.11%**	**-**	**0.21%**	**0.17%**
Total population	619,064	38.3%	998,551	61.7%	1,617,615
Aboriginal population	64,739	61.7%	40,267	38.3%	105,006
Aboriginal population as a proportion of total population (2016)	**-**	**10.5%**	**-**	**4.0%**	**6.5%**

Notes: *Excluding Victoria.

We now move to describe Aboriginal water holdings in each of State and Territory jurisdiction portion of the Basin more closely including, where possible, how entitlements were initially acquired and any known changes over time.

New South Wales

In the NSW portion of the MDB, 24 Aboriginal organisations hold 54 entitlements to a total of 11.992 GL/y of water that, as noted, constitutes the majority of known Aboriginal water holdings across the Basin. Twelve of these organisations are Local Aboriginal Land Councils, constituted under the NSW *Aboriginal Land Rights Act 1983* (*ALRA*) and 11 are Aboriginal Corporations, Associations or Housing Cooperatives constituted under various legislation. The remaining organisation is the ILSC.

Hartwig et al. (2020) identify several reasons that help to explain how Aboriginal entities in this area hold a comparatively larger—though still very small in an absolute sense—volume of water than other State and Territory jurisdictions. They show that Aboriginal water entitlements in NSW were acquired through land transfers under land rights restitution regimes and land purchasing programs offered by both the Federal and NSW Governments over the last 40-50 years, mostly prior to the unbundling of land and water rights under water reforms from the early 2000s (Hartwig et al., 2020). The land (and water) transfers made possible through Federal regimes apply across Australia and explain the acquisitions of at least some water holdings in SA and Victoria as well (Altman & Arthur, 2009). Indeed, the loans and grants offered by the ILSC remain a means by which Aboriginal entities across Australia may come to acquire water entitlements today. Until 2018, this could only occur through combined land and water acquisitions. Recent legislative change (see ILSC, 2018) makes it is possible that water entitlements alone (and unconnected to land titles) can now be acquired as well.

The land and water transfers to Aboriginal entities that occurred in NSW via measures under the *ALRA* are unique to NSW, and likely contribute to the comparatively greater volume of water held by Aboriginal entities in this region (Hartwig et al., 2020). These transfers included former Aboriginal Reserves and direct property purchases on the open market, the latter of which seems unique to NSW's land rights legislative model. Some Local Aboriginal Land Councils also hold properties purchased under the above-mentioned Federal land restitution arrangements.

Importantly, Hartwig et al. (2020) clarify that although these land restitution processes that started in NSW in the 1970s enabled some water rights reacquisition, the extent was significantly constrained. This is because these land rights regimes intentionally restricted what land Aboriginal people could claim—they were biased against Aboriginal organisations acquiring or claiming properties with agricultural potential and, therefore, water entitlements. Coinciding with this land rights era, was the "closure" of water resources to new water licence applications (Hartwig, 2020; Jackson, 2017). Now the only option available to Aboriginal organisations to access was is to purchase water entitlements on the open market.

As a result, and in combination with the absence of government commitments to restore water rights to Aboriginal communities when these rights were restructured (Jackson & Langton, 2012; McAvoy, 2006), a markedly inequitable pattern of water holdings in the NSW-MDB portion has endured. That is, NSW is the largest area of the Basin and is the jurisdiction with the largest LTDLE water volumes on issue. As already observed, 78,478 Indigenous persons live in this region of the MDB, constituting 9.3% of the area's total population. Yet, Aboriginal entities here hold just 11.992 GL/y, or a mere 0.21% of the NSW BDL.

Of significance, Hartwig et al. (2020) also found that Aboriginal water holdings in the NSW portion of the MDB declined between 2009 and 2018 by at least 17.2% (2.0 GL/y). The most significant factor that contributed to this decline was forced permanent water sales associated with liquidation and insolvency processes. Possible reasons for liquidation are numerous, but generally are attributable to ineffectual governance arrangements and/or difficulties in establishing and maintaining financial viability as required by legislation. Pressures that affect the financial viability of Aboriginal landholding organisations are well known (see, for example, Chalk & Brennan, 2015; Norman, 2015). Hartwig et al. (2020) also observed that some Aboriginal held entitlements remain vulnerable to further losses into the future. (Indeed, some small loses between 2018 and 2020 have been observed, but reasons for these declines are unknown.)

Most of the 17.2% decline affected Aboriginal water holdings in the Southern Basin portion of NSW. Those entitlements identified as at risk were all in the Northern Basin portion of NSW (Hartwig, 2020). Therefore, this is not an isolated challenge—resources and support are needed to halt further water losses across the NSW portion of the MDB. Indeed, this may be of relevance for Aboriginal water holding entities beyond NSW. Such declines in Aboriginal water holdings would further reduce options for Aboriginal communities to enjoy the purported benefits of water access and water market participation.

A final point about NSW is that it uniquely offers Indigenous-specific water entitlements (see Jackson & Langton, 2012; Tan & Jackson, 2013). It is conceivable that such entitlements could be included in the baseline. However, some types are not available in the Basin and of those that are few have been applied for and/or granted since introduced in 2004 (see Hartwig, 2020; Jackson & Langton, 2012; Sefton et al., 2020). As at early 2020, there was only one such entitlement on issue to a surface water source within the Basin—specifically, the Murrumbidgee Regulated Water Source. This entitlement is held by the Riverina Local Land Services (LLS), a non-Aboriginal government entity. While this entity intends to use this water for Aboriginal-directed purposes (Riverina LLS, 2018), we exclude this entitlement from the baseline because it is not held by an Aboriginal organisation.[30]

[30] Notably, in 2009, this water was held by an Aboriginal entity and used for cultural/environmental watering. Seeing as this is no longer the case in 2020, it constitutes a small portion of the aforementioned 17.2% loss of Aboriginal water holdings reported by Hartwig et al. (2020) (see also Hartwig, 2020).

South Australia

In the 2020 baseline, six Aboriginal entities hold 10 entitlements, all to the SA Murray regulated water source. Five of these entitlements include Class 1 and Class 3 components. By number of entitlements, most are Class 1 (for stock and domestic uses) (33 ML/y, 4% of all Aboriginal-held water in SA) and/or Class 3 (for irrigation uses) (444 ML/y, 57%). One entity holds a Class 5 entitlement (305 ML/y, 39%) which is considered an industrial entitlement (i.e. may be used for aquaculture).

Overall, several Aboriginal-held SA water entitlements were acquired via (former) ILC land purchasing programs (Altman & Arthur, 2009), but the means of acquisition for others is not known. Four of these identified entitlements (held by three Aboriginal entities) were identified in Altman and Arthur's 2009 scoping exercise. In fact, these were the *only* Aboriginal-held entitlements they found across all of SA at that time. The volumes of two entitlements listed by Altman and Arthur (2009) have changed—one is now 0 ML, while another is now 100 ML larger.[31] The timing and reasons for these changes are unknown. The newly identified six entitlements are held by entities that do not have an "Aboriginal" identifier in their names. Given this was a central approach to the searching strategy of Altman and Arthur (see Section 3), it is possible that these entitlements were also Aboriginal held in 2009. Further research is required to determine when and how Aboriginal-held entitlements were acquired in SA and any changes over time.

Overall, Indigenous persons make up a 3.3% share of the 2016 ERP for the SA portion of the MDB, while Aboriginal entities hold 0.11% of all LTDLE water in SA. Like the situation in the NSW-MDB, this represents a significant disparity on the basis of population share.

Queensland & ACT

In 2009, Altman and Arthur identified a number of Aboriginal-held water entitlements as well as organisations that possibly held entitlements in Queensland. Within the MDB portion of Queensland, they only identified possible holders. Searching the names of these entities, as well as several others suggested by Queensland Government staff in early 2020, the Queensland *Water Allocations Register* revealed that none actually hold water entitlements in the MDB. In other words, while Indigenous peoples represent a 6.0% share of the total population in the Queensland portion of the MDB, Aboriginal entities hold no share of the available water use entitlements.

The ACT was not included in Altman and Arthur's scoping study. The ACT has the smallest LTDLE volume across the Basin States and Territories. Here, Aboriginal entities hold no water use entitlements, despite an Indigenous population of almost 7,500, who constitute a 1.9% share of the total ACT population.

Victoria

Evidence suggests there are Aboriginal-held water entitlements in the Victorian-portion of the MDB, but specific details are not available. For instance, Altman and Arthur (2009) reported extremely limited details about actual water entitlements held by Aboriginal entities in Victoria. More recently, a confidential report by Aither (2018) commissioned by the Victorian Department of Environment, Land, Water and Planning identifies a handful of Aboriginal organisations that hold water entitlements across the State, but specific entitlements and locations are confidential. At least some entitlements are known to have been acquired through (former) ILC purchases, as described in other jurisdictions (Altman & Arthur, 2009; Jackson, Moggridge & Robinson, 2010). Anecdotal evidence

[31] Altman and Arthur (2009) list the former, as 694.7 ML/y and the latter as 46.0 ML/y. Both are Class 3 entitlements.

such as that reported in ACCC (2020) indicates, though, that the volume of Aboriginal-held water in the Victorian portion of the MDB is, like other jurisdictions, extremely small.

Distribution by SDL resource units

Figure 13 shows the distribution of known Aboriginal water holdings by SDL resource unit across the Basin. Ten of the 11 SDL resource units where we identified Aboriginal-held water are in NSW. The largest Aboriginal-held volume is within the NSW Murray SDL resource unit (4.225 GL/y), closely followed by the Murrumbidgee SDL resource unit (3.954 GL/y). However, as total long-term water extractions are greatest in these two SDL resource units (1,707.7 GL/y, and 2,117 GL/y respectively), these Aboriginal holdings constitute 0.25% and 0.19% of all water available in each. The SDL resource unit where the portion of water held by Aboriginal organisations is largest is the Lower Darling (1.64% or 0.902 GL/y) and the smallest is the Gwydir (0.01% or 0.031 GL/y).

Figure 14 shows the spatial distribution of Aboriginal water holdings per SDL resource unit. Here, areas that are shaded in darker purple denote areas where comparatively larger volumes of water are held by Aboriginal entities. Recall that the total volume of water held by and distributed among Aboriginal entities across the whole Basin is 0.17% of the BDL (excluding Victoria).

We note that these figures may give the impression that the Aboriginal water holdings are distributed evenly within each individual SDL resource unit. In reality, water holdings are generally concentrated in some river systems and water sources within these areas.

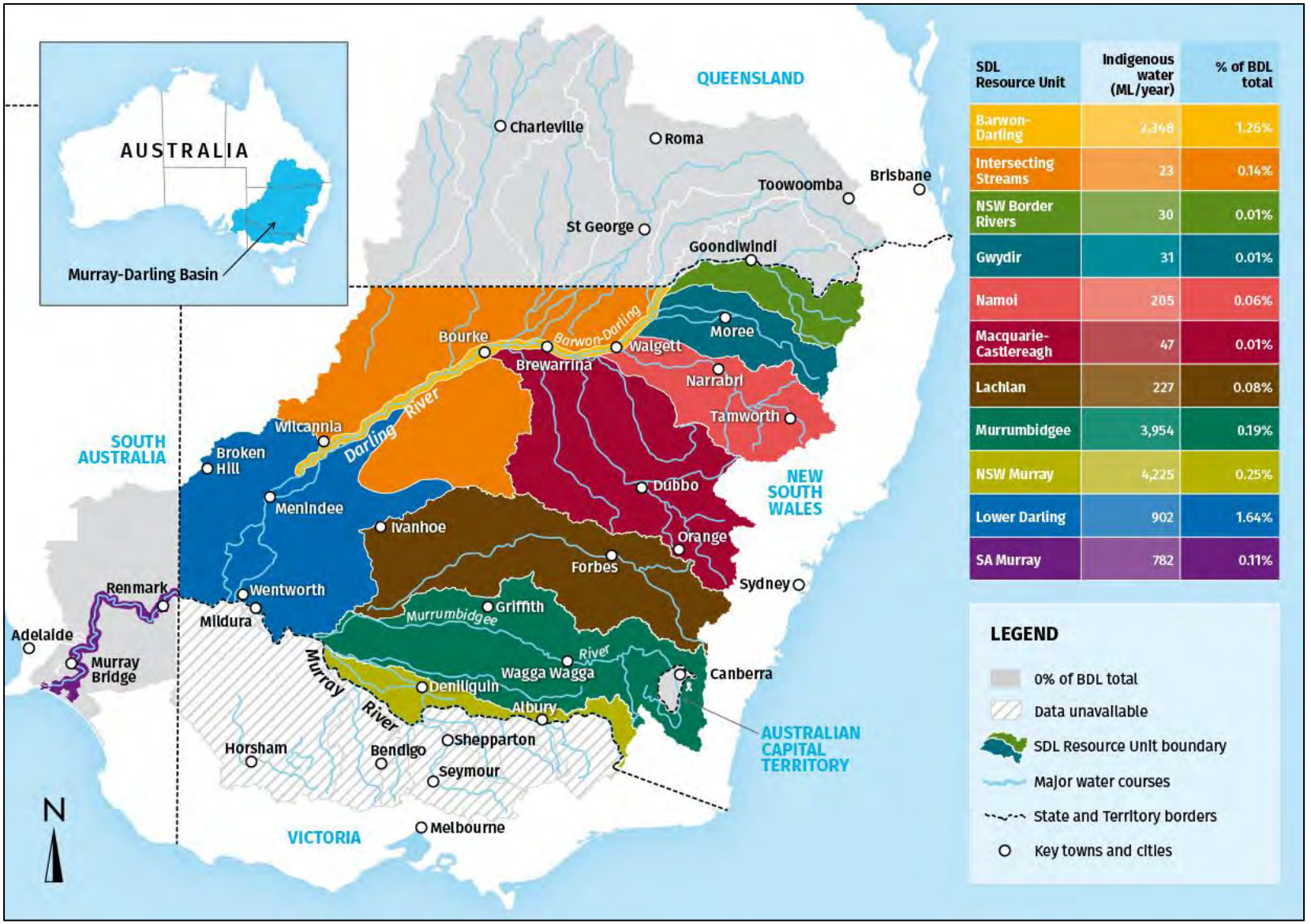


Figure 13: Distribution of Aboriginal water holdings and their share of total available water (BDL) per SDL resource unit

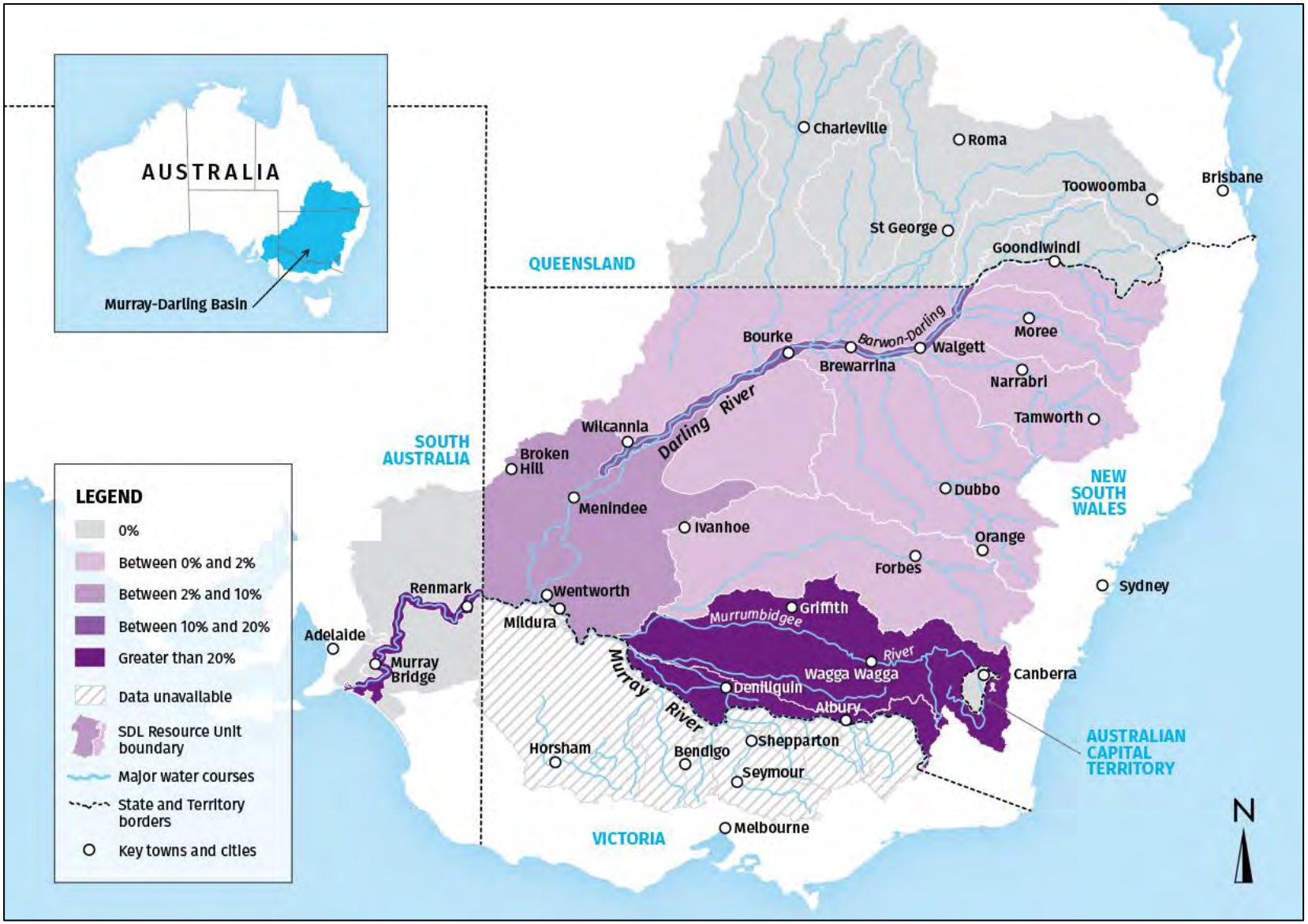


Figure 14: Spatial distribution of all Aboriginal water holdings by SDL resource unit, 2020

Reliability and security of Aboriginal water access and entitlement market value

Research indicates that entitlement reliability or security influences how licence holders plan for, use and benefit from their water entitlement/s (Peel, Schirmer & Mylek, 2016; Wheeler, Zuo & Hughes, 2014). Therefore, it is useful to consider and examine the different entitlement types held by Aboriginal entities in the 2020 baseline, and their relative reliability or security. Doing so provides insights into the regularity or certainty of water access Aboriginal peoples can benefit from as well as the economic value of their holdings. In this section, we examine the reliability and security of Aboriginal-held water entitlements, and then provide an estimate of their market value.

A complete list of entitlement types held by Aboriginal organisations is provided in Table 8.

Table 8: List of entitlement types held by Aboriginal organisations

Region	SDL resource unit	Entitlement types held by Aboriginal organisations
Northern Basin	Barwon-Darling	- Unregulated (A-Class) - Unregulated (B-Class)
	Intersecting Streams	- Domestic & Stock - Unregulated
	NSW Border Rivers	- Unregulated
	Gwydir	- Unregulated
	Namoi	- Domestic & Stock - General Security
	Macquarie-Castlereagh	- Domestic & Stock - General Security - High Security (Town Water Supply) - Supplementary - Unregulated
Southern Basin	Lachlan	- Domestic & Stock - General Security - High Security - Unregulated
	Murrumbidgee	- Domestic & Stock - General Security - High Security - Supplementary (Lowbidgee)
	NSW Murray	- Domestic & Stock - General Security - High Security - Supplementary - Unregulated
	Lower Darling	- General Security
	SA Murray	- Class 1 - Class 3 - Class 5

Note: Water sources not listed in the interest of confidentiality.

Unregulated and regulated entitlements

Across the Basin, 87% (by volume) of all surface water on issue is accessed through regulated entitlements, with the remaining 13% accessed through unregulated entitlements, based on 2018-19 data (BOM, 2020).[32] Unregulated entitlements can offer less reliable water access and are more difficult to trade temporarily compared to regulated entitlements (Wheeler & Garrick, 2020). This is largely because these systems tend to have less regulating infrastructure to control and store water

[32] Note that BOM (2020) data is based on nominal volumes while Aboriginal holdings use LTDLE volumes. No other more comparable data is currently available, and this still likely presents general

compared to more regulated water sources, because rules may more frequently limit or embargo extraction and/or trade, and because smaller volumes are on issue (Wheeler & Garrick, 2020).

Figure 15 below shows that Aboriginal entitles currently hold, and therefore access, water through a mixture of regulated (left hand side, 79%) and unregulated (right hand side, 20%)[33] water entitlements across the Northern Basin (dark blue, 21%) and the Southern Basin (light blue, 79%). Looking across the whole Basin, this image shows that most water held by Aboriginal entities is accessed via regulated entitlements (discussed in-depth below) within the Southern Basin. Less than 0.1% of Aboriginal-held water in the Southern Basin is accessed via unregulated entitlements. By comparison, only 5% of all surface water (by volume) on issue in the Southern Basin are unregulated, based on 2018-19 data (BOM, 2020).

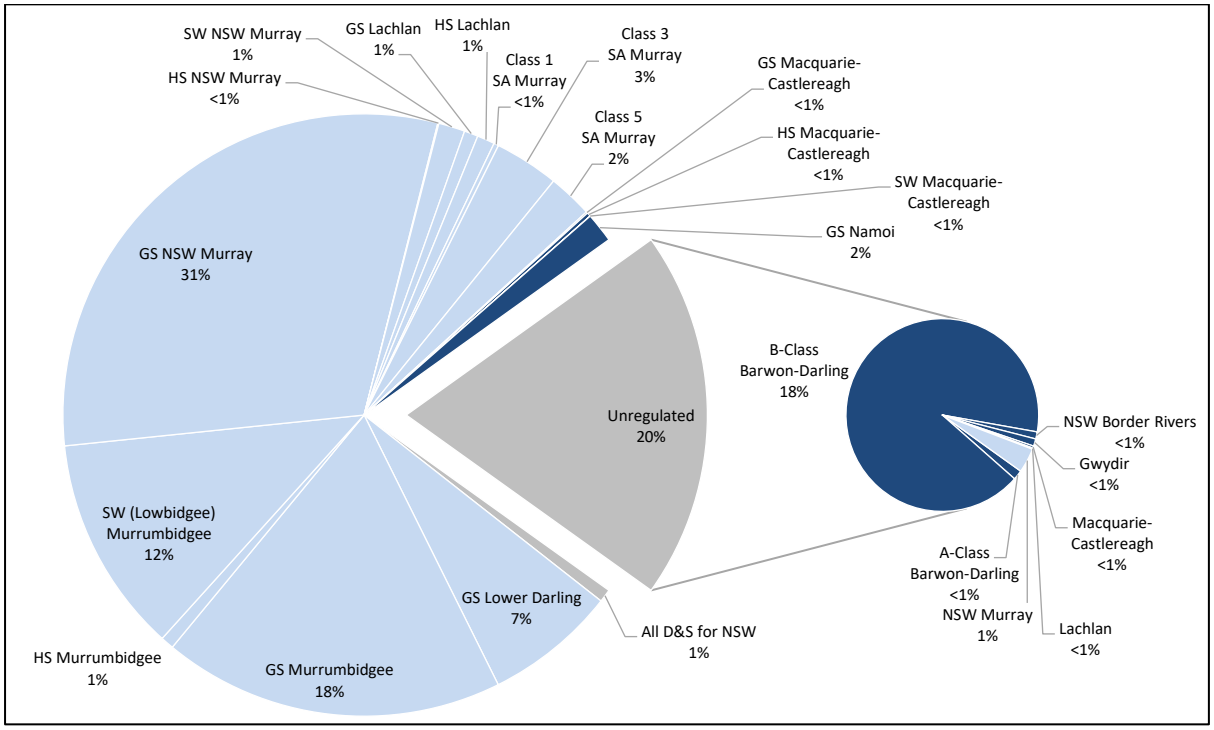


Figure 15: LTDLE Aboriginal water holdings by entitlement type, 2020

Notes: Lighter blue denotes Southern Basin entitlements, dark blue denotes Northern Basin entitlements, and grey denotes both. GS: General Security. HS: High Security. SW: Supplementary Water. D&S: Domestic & Stock. Specific water sources for Unregulated entitlements not listed in the interest of confidentiality.

This image also shows that the majority of water in the Northern Basin held by Aboriginal entities is accessed through unregulated entitlements (2,418 ML/y or 91%). This may be expected given the Southern Basin is more hydrologically connected than the Northern Basin. However, BOM (2020) data for 2018-19 shows that only 38% (by volume) of surface water on issue across the Northern Basin is accessed via unregulated entitlements. This means that Aboriginal entities hold disproportionately more water under unregulated entitlements not only across the whole Basin, but particularly in the Northern Basin, which, as noted, can be a less reliable means of accessing water and of lower market value.

Regulated entitlements

Second, we examine the reliability or security of water access under specifically *regulated* water entitlements. Many factors influence the reliability of regulated entitlements including regional

[33] All NSW Domestic & Stock entitlements are presented together, which constitutes approximately 0.7% of all Aboriginal-held water in the Basin.

water availability and water storage infrastructure. The Interim Inspector-General of MDB Water Resources (2020) reviews Basin States each have developed different approaches to water allocation, resulting in differences in the variability of water allocations from year to year. These differing overarching allocation frameworks partly explain some of the differences observed between individual States and Territories jurisdictions.

Comparing the reliability of different entitlements is difficult. Indeed, the Interim Inspector-General of MDB Water Resources' (2020) recent review of water shares across the Southern MDB found that there is "very little data available about long-term reliability of different entitlement types" (p. 21). That review also concluded that "there is a high likelihood that historical expectations of reliability are no longer accurate because climate conditions have changed," particularly for NSW General Security and Victorian Low Reliability water entitlements (Interim Inspector-General of MDB Water Resources, 2020, p. 21). These factors complicate reporting about the relative priority and reliability of Aboriginal held entitlements across the Basin. With these challenges in mind, the following discussion is indicative only, and focuses only on main types of regulated entitlements using water allocation data.[34]

Water that is *allocated* to these regulated entitlements can actually be accessed and used (see Figure 4 earlier) by the entitlement holders or, following an allocation trade, by other users. Specifically, we used the average allocation per entitlement type at the close of the last 11 water years (from 2009-10 to 2019-20) to indicate the priority or reliability of different Aboriginal held entitlements.[35] Figure 16 presents the LTDLE volumes of Aboriginal-held water under these key regulated entitlement types, showing the indicative reliability of each entitlement. This figure shows that the majority (87.3%) of LTDLE Aboriginal-held water under regulated entitlements is of lower priority (those in orange). In other words, only a small number of Aboriginal organisations benefit from comparatively greater reliability and certainty of water access; the vast majority receive little such benefit. Further, much of the water that can be accessed through the more reliable entitlements can only be used for domestic and stock purposes.

[34] Supplementary regulated entitlements and unregulated entitlements are excluded because actual permitted water access through these arrangements is not easily identifiable or comparable to regulated entitlements. Supplementary entitlements tend to receive a 100% allocation at the beginning of each year, but actual water access is determined by Minister Announcements. Similarly, water entitlements for unregulated rivers and watercourses receive full allocations each water year but actual water access is dictated and determined based on river heights and/or flow thresholds. In both cases allocation information is not representative of actual water access.

[35] NSW data accessed from the NSW Water Register (https://waterregister.waternsw.com.au/water-register-frame). SA data supplied directly by SA DEW.

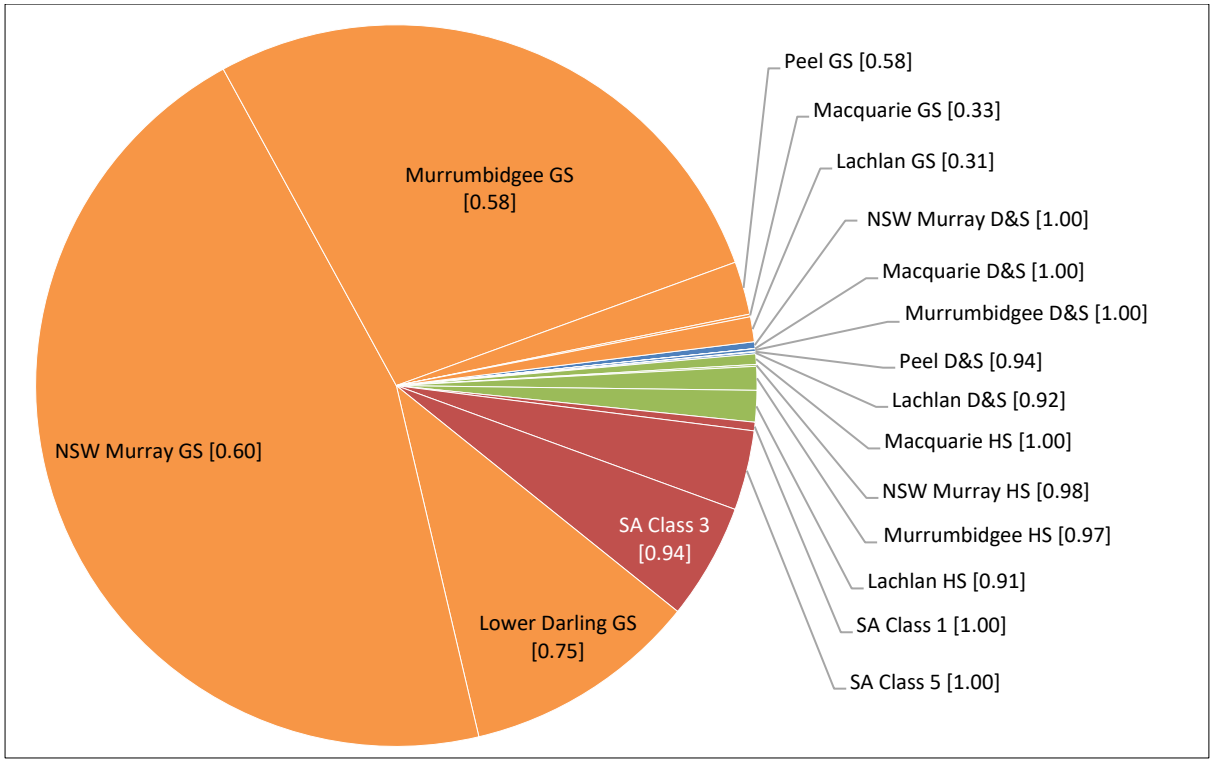


Figure 16: LTDLE Aboriginal-held water under regulated entitlements by entitlement reliability, 2020

Notes: Entitlement reliability is indicated using the entitlement allocation average at the close of water years from 2009-10 to 2019-20 and is presented in square brackets for each Aboriginal-held regulated entitlement type.[36] Allocation averages for Peel (in the Namoi SDL resource unit) are from only 2010-11 to 2019-20 based on data availability.
GS: General Security. HS: High Security. SW: Supplementary Water. D&S: Domestic & Stock.

Notably, all Aboriginal-held water entitlements in SA are more reliable than most other known Aboriginal-held entitlements in the Basin. This is reflective of the fact that all South Australian entitlements are more reliable than entitlements from other Basin states more generally. Of interest, SA River Murray Class 3 entitlements were recently renamed "Class 3 (High Security)" as this improves alignment "with similar products interstate, like New South Wales high security licences and Victorian high-reliability shares" (Natural Resources SA MDB, 2020).

In Victoria, we know from engaging with agency staff that Aboriginal entities hold water under both High Reliability and Low Reliability entitlements though it is not known in which valleys specifically these entitlements are located. Without this information, specific insights and analysis about the reliability of Victorian Aboriginal water holdings are not possible, but for interests' sake, it is worth briefly considering how some of these entitlements compare with those listed in Figure 16. Historically, Victorian Low Reliability entitlements receive water allocations less than NSW General Security entitlement and in recent years, this is due to Victoria's more conservative approach to seasonal water allocation as well as less water availability (Interim Inspector-General of MDB Water Resources, 2020). Victorian High Reliability (HR) entitlements have far greater certainty of access than Low Reliability options, with water allocation averages ranging from 0.78 (Ovens HR) to 1 (Vic Murray HR) (NVRM, 2020). These indicators of access reliability compare with some of NSW General Security entitlements and higher from Figure 16.

[36] It is necessary to clarify the difference between water allocation and LTDLE factors, especially as both are indicated by a value between 0 and 1. Put simply, water allocations are measures of *actually available* water that can be (though is not always) used by entitlement holders. These measures are informed by climatic and water storage conditions at specific times. By contrast, LTDLE factors reflect *average* long-term water *use* trends and are representative only. Long-term average water allocation data (calculated using modelling) is an input in determining LTDLE factors.

We see there are two key observations from reviewing the entitlements types of Aboriginal water holdings. First, Aboriginal water access through unregulated entitlements is disproportionately higher than all water holdings at both the whole Basin and the Northern Basin scales. Second, the majority of Aboriginal water access through regulated entitlements occurs through comparatively less reliable or secure entitlements which are, perhaps, of less market value. These conditions likely affect how Aboriginal entities can use and benefit from their water. In some cases, it may negatively affect their ability for longer-term planning associated with water use (see Peel et al., 2016; Wheeler et al., 2014b). This is only likely to worsen with a drying climate and the associated implications for water availability and access (Interim Inspector-General of MDB Water Resources, 2020).[37]

Market value estimate

There are multiple water valuation methodologies (see Seidl, Wheeler & Zuo, 2020) as well as variations in water pricing and sales that, together, make estimating and comparing market values difficult. That is, the dollar value of 1 ML of water in both the entitlement and allocation markets differs across water sources and based on total sale volume, due to regional differences in supply versus demand. In what follows, we present market valuations as estimates only, but believe them to be reasonable and justifiable given the available data. For clarity and transparency, we detail the method used for this valuation in Appendix F.

We estimate the market value of Aboriginal water holdings in the MDB to be approximately $18.4 million in 2015-16 water market terms. These holdings constitute just 0.11% of the MDB's $16.5 billion water market (in 2015-16 terms) (ABARES, 2018a). The proportional contribution of different water entitlement types towards this total market value is presented in Figure 17. We estimate Aboriginal-held water entitlements in the Southern Basin to be worth $15.3 million. We estimate Aboriginal-held water entitlements in the Northern Basin to be worth $3.1 million. Across the Basin, we estimate Aboriginal-held unregulated water entitlements are valued at about $1.8 million.[38]

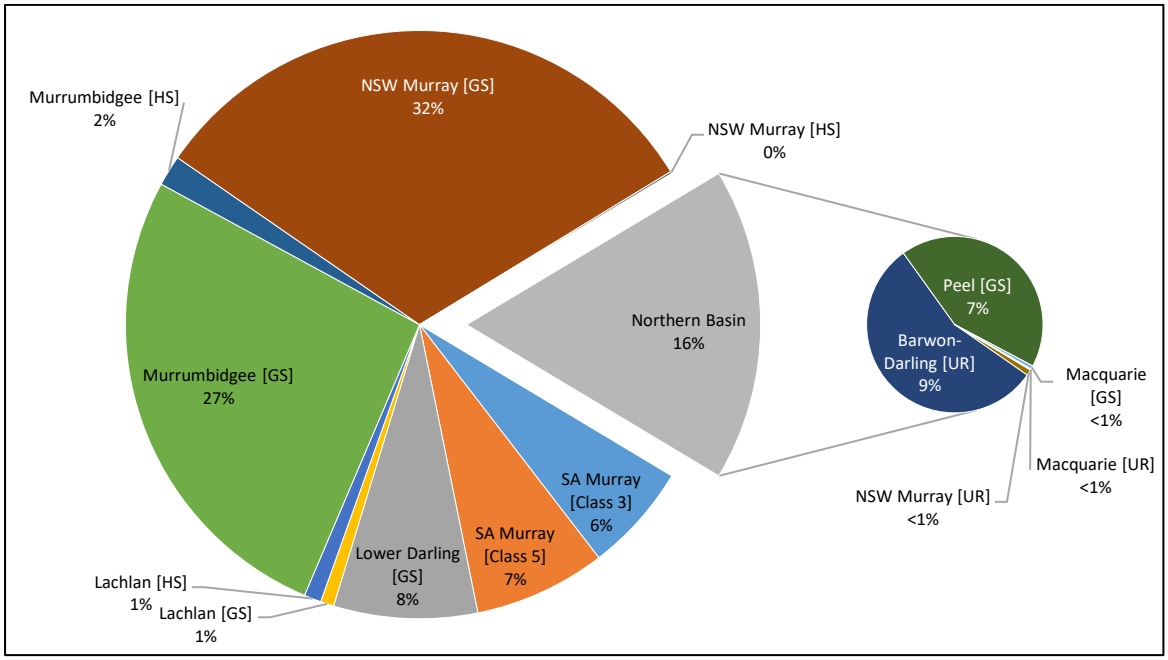
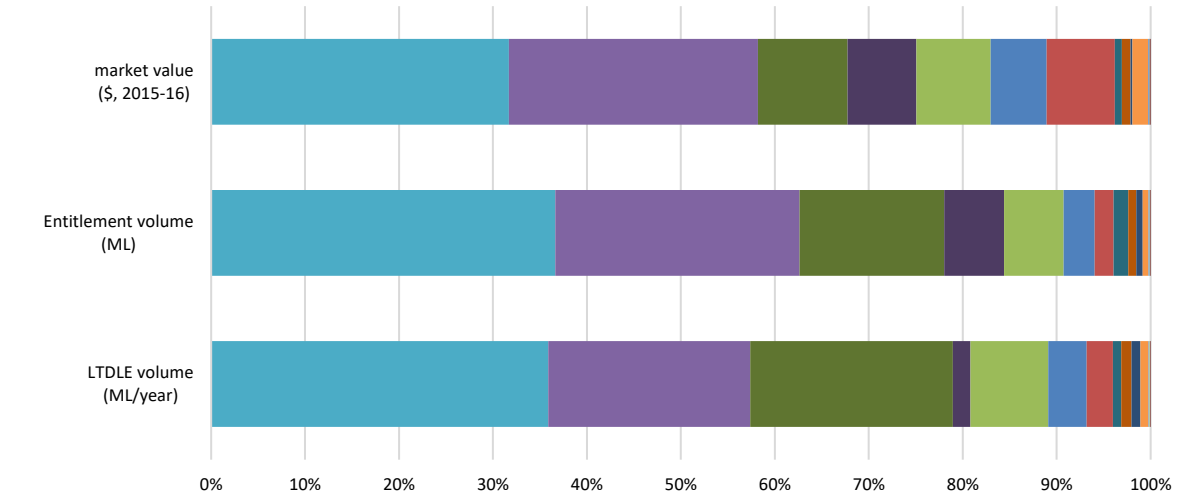


Figure 17: 2020 Aboriginal surface water holdings by estimated market value in 2015-16 market terms
GS: General Security. HS: High Security. SW: Supplementary Water. D&S: Domestic & Stock. UR: Unregulated. Specific water sources for unregulated entitlements are not listed in the interest of confidentiality.

[37] We have not considered any influence or impact of carry over for different entitlements in this analysis and discussion.

[38] Valuation estimates for unregulated and Northern Basin entitlements have a higher degree of uncertainty. See Appendix F.

Of note, water held under NSW Murray and Murrumbidgee GS water entitlements constitutes over half (57%) of all market value of Aboriginal water holdings. This is somewhat expected given water entitlement volumes and LTDLE volumes are largest for these entitlement types, as shown in Figure 18. Note that only entitlement types for which a market value can be provided using the method described in Appendix F are presented in Figure 17 and Figure 18.



	LTDLE volume (ML/year)	Entitlement volume (ML)	market value ($, 2015-16)
NSW Murray [GS]	3906	5588	$5,844,713
Murrumbidgee [GS]	2342	3963	$4,895,098
Barwon-Darling [UR]	2348	2348	$1,756,539
Peel [GS]	203	972	$1,353,568
Lower Darling [GS]	902	969	$1,458,083
SA Murray [Class 3]	444	503	$1,101,048
SA Murray [Class 5]	305	305	$1,339,002
Lachlan [GS]	95	240	$135,180
Lachlan [HS]	121	130	$173,553
NSW Murray [UR]	104	104	$34,623
Murrumbidgee [HS]	91	93	$310,588
Macquarie [GS]	10	20	$20,407
Macquarie [UR]	9	9	$6,051
NSW Murray [HS]	7	8	$21,140

Figure 18: 2020 Aboriginal water holdings by LTDLE volume, entitlement volume and market value (in 2015-16 terms)
Note: Specific water sources for unregulated entitlements are not listed in the interest of confidentiality.

Water recovered for the environment and Aboriginal-held water

In Table 9, we present Aboriginal water holdings alongside water that governments have recovered for the environment from comparable takes (as at 31 March 2020).[39] This shows that governments have recovered some 19.3% of LTDLE water under entitlement for the environment. This volume of water is sizeable—more than 150 times that currently held by Aboriginal entities.

Growing evidence suggests that environmental water management and delivery can benefit First Nations across the Basin, particularly where First Nations are involved in some capacity (Jackson & Nias, 2019; Mooney & Cullen, 2019; Weir, 2009). In principle, this volume of water presents significant potential for pursuing and delivering co-benefits for both the environment and First

[39] The exception here is the Condamine-Balonne SDL resource unit in Queensland, where it is understood that water recovery is associated with take by floodplain harvesting (Carol Bruce, Assistant Director, Surface Water, SDL Accounting & Aboriginal Partnerships Branch, MDBA, *pers comm*, 6 May 2020).

Nations peoples across the Basin. However, this is a very complex and nuanced area of water planning and policy. More research and deliberation with First Nations peoples is needed to understand and explore the array of outcomes from the co-management of environmental water more fully.[40] We note that the recent policy shift that rules out further buy backs (DAWR, 2020) may have implications here.

Table 9: Aboriginal-held water and water recovered by governments for the environment

Area	Aboriginal- held water (2020)		Water recovered for the environment (31-Mar-2020)	
	LTDLE (GL/y)	share of the BDL for the area (%)	LTDLE (GL/y)	share of the BDL for the area (%)
Queensland*	0	0	127.1	13.3
NSW	11.992	0.21	1,004.6	17.8
ACT	0	0	0	0
Victoria	*Data unavailable*		825.6	23.2
South Australia	0.782	0.11	141.0	20.2
Northern Basin total	**2.911**	**0.11**	**381**	**14.0**
Southern Basin (inc Vic) total	**9.863**	**0.12**	**1,718**	**21.0**
Southern Basin (exc Vic) total	**9.863**	**0.21**	**892**	**19.3**
Total Basin (inc Vic)	**12.774**	**0.12**	**2,098**	**19.3**
Total Basin (exc Vic)	**12.774**	**0.17**	**1,273**	**17.3**

Source: Environmental water recovered from MDBA (2020b)
Note: *Condamine-Balonne SDL resource unit in Queensland, where water recovery is associated with take by floodplain harvesting.

Some legislative and policy work is underway to enhance and broaden these benefits and outcomes from environmental water for Aboriginal peoples. This includes collaborative projects in the Northern and Southern Basins that aim to identify and incorporate First Nations' priorities into annual and long-term environmental watering activities (Select Committee on the Multi-Jurisdictional Management and Execution of the Murray Darling Basin Plan, 2019).[41] From 2019, the MDBA must also "annually report on how, when planning for environmental watering, holders of held environmental water considered Indigenous values and Indigenous uses and involved Indigenous people" (Select Committee on the Multi-Jurisdictional Management and Execution of the Murray Darling Basin Plan, 2019, p. 59).

First Nations aspire to use water for commercial gain. Therefore, developing and further understanding First Nations' benefits from environmental watering should not occur at the expense of reallocating water to First Nations—*both* require development.

Aboriginal water holdings as a portion of SDL

As mentioned, the Basin Plan requires that surface water diversions be reduced from BDLs to SDLs, meaning that in the future, consumptive water use in each valley will be allowed up to the SDL (SA DEW, 2019). As such, SDLs will become the new benchmark for future analyses and comparisons.[42] Therefore, it is worth considering Aboriginal-held water entitlements as a proportion of not only the

[40] Importantly, environmental watering does not automatically satisfy, nor can it be a substitute for, Aboriginal watering objectives and priorities.
[41] In the Northern Basin, the MDBA is working with NBAN on the First Nations Environmental Water Guidance Project. In the Southern Basin, the MDBA and the Commonwealth Environmental Water Office are working with MLDRIN on the First Nations' Environmental Water Objectives Project.
[42] Noting that SDL values and LTDLE factors may alter slightly as better information becomes available. See Appendix E.

equivalent and comparable BDL as we have so far, but also the equivalent and comparable SDL, as presented in Table 10. As expected, Aboriginal water holdings constitute a slightly larger proportion of SDL compared to the larger BDL extraction limit, but these proportions remain extremely small.

Table 10: Aboriginal water holdings as portion of equivalent and comparable BDLs and SDLs, early 2020

Area	LTDLE water held (GL/y)	Share of the BDL for the area (%)	Share of the SDL for the area (%)
Queensland	0	0	0
NSW	11.992	0.21	0.27
ACT	0	0	0
Victoria	Data unavailable	Data unavailable	Data unavailable
South Australia	0.782	0.11	0.14
Northern Basin total	**2.911**	**0.11**	**0.12**
Southern Basin (inc Vic) total	**9.863**	**0.12**	**0.16**
Southern Basin (exc Vic) total	**9.863**	**0.21**	**0.28**
Total Basin (inc Vic)	**12.774**	**0.12**	**0.15**
Total Basin (exc Vic)	**12.774**	**0.17**	**0.22**

Note: BDL and SDL data is determined using only equivalent takes (i.e. "take from a regulated river" and "take from a watercourse") and based on 2019/20 water year estimates (MDBA, 2019c, 2019d).

Aboriginal water holdings: Groundwater

We now describe Aboriginal-held groundwater entitlements across the MDB. Overall, very few such entitlements were identified but several observations warrant attention. Indeed, so few were identified that, in the interest of confidentiality, Appendix C presents Aboriginal groundwater holding data for the WRP area, State Basin portion and overall Basin scales, but not the SDL resource unit level.

Spatial distribution, character of entitlements and change over time

Across the groundwater sources in the MDB, we found six[43] entitlements held by six Aboriginal entities in 2020. These entitlements total 556 ML, with individual entitlements ranging from 19 ML to 240 ML. These Aboriginal-held groundwater entitlements constitute 0.022% of the available groundwater resource in the Basin States (excluding Victoria), or 0.027% of the available groundwater resource of the whole Basin. Drawing on anecdotal evidence about Aboriginal water holdings in the Victorian portion of the Basin (including conversations with Victorian agency staff and ACCC (2020)), we anticipate that Aboriginal water holdings could, at a generous estimate, constitute up to 0.03% of the whole Basin's available water.

No Aboriginal-held groundwater entitlements were located in Queensland, ACT, and South Australia. All six relate to aquifers in NSW in six different SDL resource units across four WRP areas. Table 11 below lists Aboriginal-held groundwater information for these four WRP areas. No Aboriginal water holdings exist in the remaining seven NSW WRP areas, as shown in Appendix C.

[43] While Aboriginal water holdings in Victoria are uncounted, there is a possibility of a greater number.

Table 11: WRP areas where Aboriginal entities hold groundwater entitlements

WRP area	Aboriginal groundwater entitlements (ML)	Comparable volume of Aboriginal groundwater entitlements (ML)	Comparable volume of Aboriginal groundwater entitlements as a share of available groundwater resource (%)
Lachlan Alluvium*	59	42	0.020
NSW Murray-Darling Fractured Rock	240	240	0.105
Macquarie-Castlereagh Alluvium*	39	29	0.036
Namoi Alluvium*	218	182	0.081

Note: *denotes WRP areas with a comparison ratio of less than 1.

At a scale higher, Aboriginal-held groundwater (0.556 GL) compared with the available groundwater source across the whole NSW-MDB (1,659 GL), is 0.034%. We estimate that these Aboriginal-held groundwater entitlements are valued at approximately A$772,800 (in 2015-16 terms), which equates to about 0.005% of the market value of all groundwater entitlements in the MDB in 2015-16.

As already noted, most groundwater entitlements across the Basin receive full (i.e. 100%) allocations most water years. Indeed, the six groundwater entitlement types held by Aboriginal entities have received 100% allocations at the beginning of every water year on record,[44] with the exception of one entitlement in one year (2019-20). Evidently, the reliability of groundwater entitlement types held by Aboriginal entities are relatively comparable and it is not necessary to use high allocation as an indicator of entitlement security or reliability (as we did for surface water).

Anecdotal evidence suggests that NSW Aboriginal organisations acquired these groundwater entitlements in the same ways that surface water entitlements were initially acquired; combined with land transfers, under State or Federal land rights regimes. Four of these Aboriginal organisations are Local Aboriginal Land Councils, three of which hold surface water entitlements. The remaining two are Aboriginal corporations, of which one has a surface water entitlement.

The unique Indigenous-specific water entitlements available in NSW (discussed earlier with respect to surface water) could conceivably exist for groundwater sources. This is made possible through NSW's Water Sharing Plans.[45] At this time, however, none were identified within NSW-MDB groundwater sources.

We acknowledge that Altman and Arthur (2009) identified more than six entitlements in NSW MDB groundwater sources. We classify this apparent reduction over time into two categories. First, at the time their baseline was developed, some groundwater entitlements were still under the former *Water Act 1912* (NSW) framework and had not been converted to current aquifer water access licences under the *Water Management Act 2000* (NSW). This conversion occurred upon commencement of a Water Sharing Plan (NSW Department of Primary Industries, 2015). Many of the groundwater entitlements that Altman and Arthur (2009) identified were without volumes. Searching the NSW Water Register reveals these entitlements were not converted. This is because the water access permitted under the former licensing framework was for stock and/or domestic purposes, and under the new regime this is considered a basic landholder right and therefore an

[44] On record means since converted to WALs under the *Water Management Act 2000* (NSW).

[45] For example, outside of the MDB, at least one such entitlement exists in the Dorrigo Basalt Groundwater source.

entitlement to take water is no longer required (s 52, *Water Management Act 2000*) (see also NSW Department of Primary Industries, 2015). Therefore, this apparent decline in the number of entitlements does not appear to represent a decline in Aboriginal organisations' access to groundwater resources.

By contrast, the second category of loss is permanent sales or transfers, which *does* constitute a loss of access. Specifically, through the NSW Water Register, we traced the permanent transfer of 169 ML of ongoing water rights held under aquifer entitlements away from Aboriginal ownership between 2009 and 2020. This constitutes a 23.3% decline Basin-wide of Aboriginal groundwater holdings since 2009. Reasons for these changes (declines) among aquifer holdings are unknown and require further investigation.

5. Discussion, research recommendations and policy implications

The Indigenous population baseline and analysis presented in this report reveals the following key findings:

- the MDB is home to more than 120,000 Indigenous persons (15.1% of all Indigenous Australians nationally), who represent 5.3% of the total MDB population;
- in some regions and townships (particularly northern and western NSW), Indigenous peoples constitute significant proportions of the total population; and,
- the MDB Indigenous population is growing considerably faster than the non-Indigenous population.

Our 2020 baseline reveals that Aboriginal organisations hold at least 12.774 GL/y of surface water and that this is not likely to exceed 0.17% of all surface water holdings across the Basin. Using LTDLE volumes as a measure of water access, we can conclude that Aboriginal entities have greater surface water access in the Southern Basin (79.0%) than the Northern Basin (21.0%). The severity of the inequity in water distribution is apparent when we consider that 61.7% of the Indigenous population in the Basin (excluding Victoria) live in this Northern Basin area. In this same area, Aboriginal entities hold rights to a smaller proportion of available surface water, under entitlements with access conditions that are generally less secure or reliable.

The 2020 baseline reveals that Aboriginal organisations hold even less groundwater, with entitlements totalling 0.556 GL, which equates to 0.022% of the available groundwater resource across the whole Basin. We cannot combine this volume with the total Aboriginal surface water holdings because of differences in water accounting methods for surface water and groundwater.

NSW has the majority of Aboriginal held water entitlements (both surface water and groundwater). South Australian Aboriginal entities hold some surface water entitlements in the Basin, but no groundwater entitlements. No water entitlements of either kind were found to be held by Aboriginal entities in Queensland or the ACT. In 2015-16 terms, we estimate Aboriginal-held surface water entitlements are valued at approximately $18.4 million, while Aboriginal-held groundwater entitlements are valued at approximately $772,800. The approximate total market value of these entitlements is A$19.2 million in 2015-16 terms, which equates to 0.12% of the total market value of all MDB entitlements in that water year (ABARES, 2018a).

In what follows, we present a series of research and policy recommendations based on these findings and comment on the limitations of this research. Where possible, we emphasise the relevance and importance of these observations and recommendations for the MDBA based on its legislative functions, including those relating to the Basin Plan. However, these recommendations and reflections are also of relevance to MLDRIN, NBAN, Basin States and Territories, and assorted government departments and entities such as the Department of Agriculture, Water and the Environment, and the ILSC.

Future demographic, socio-economic and water research

The MDBA, along with the Department of Agriculture, Water and the Environment, have produced and/or commissioned an array of population-wide socio-economic studies (see, for example, MDBA, 2017b; Schirmer, 2017; Schirmer & Mylek, 2020) and regional profiles across the Northern and Southern Basins (MDBA, 2018c) in recent years. However, these and other analyses present very little Indigenous-specific socioeconomic and demographic data (see also Marden Jacobs, 2019). This

can mask profound and distinct socioeconomic and disadvantage differences between Indigenous and non-Indigenous populations in the Basin (ABS et al., 2009; Schirmer & Mylek, 2020; Taylor & Biddle, 2004). By extension, it can also mask different experiences of and impacts from the Basin Plan, water recovery, and water reform more broadly (Marsden Jacobs, 2019).

The MDBA is responsible for implementing and monitoring the Basin Plan, including progress relating to its objectives and outcomes. The Basin Plan includes overall objectives such as optimising social, economic, and environmental outcomes arising from the use of Basin water resources in the national interest and improving water security for all uses of Basin water resources (cl 5.02). Its overall intended outcome is a healthy and working Murray-Darling Basin, which includes (a) communities with sufficient and reliable water supplies that are fit for a range of intended purposes, including domestic, recreational and cultural uses; and (b) productive and resilient water-dependent industries, and communities with confidence in their long-term future (cl 5.02). Measuring or monitoring progress against the objectives and outcomes relating to Indigenous peoples is difficult if baseline information is incomplete, inadequate, or non-existent.

To address this gap, we therefore recommend that the MDBA undertake further demographic and socio-economic baselining research to supplement the Indigenous population baseline data presented in this report. Having Aboriginal people drive the development of socioeconomic and demographic baselines will help to overcome some of the noted limitations of Census and other administrative counts (see Section 3), and enable First Nations peoples to express their collective identities on their terms that move beyond conventional government-determined categories and classifications (Taylor, 2011; Walter, 2018). We recommend that that such a program consider the whole Basin as well as smaller water management units, as we have in this report.

Such a program could include:

- Indigenous and non-Indigenous population-focused data, including populations by localities, settlements, townships, and classifications of remoteness, as well as population change and migration, population age and sex structure, and future population projections;
- socio-economic and demographic characteristics including workforce and labour status including industry and occupation data, business ownership, income, particularly where land and water are involved; and,
- socioeconomic and wellbeing activities and outcomes that stem directly and indirectly from holding and/or managing land and water.

The baselines developed in this report provide much-needed information for the latter area of research. We understand that the MDBA has commissioned other relevant work here too, in part in response to recommendations from the recent Independent the Assessment of Social and Economic Conditions in the MDB (see Sefton et al., 2020).

A concerted focus on the benefits and impacts for First Nations from environmental watering projects and actions and monitoring of these is also needed. In particular, we recommend that the MDBA, and State and Territory agencies build upon their existing arrangements to further centre and prioritise First Nations' voices and participation in environmental watering. We stress, though, that such actions should *complement*, not be a substitute for, the redistribution of water to Aboriginal people for direct economic benefit, for which we provide recommendations later.

Insights generated through the profiling and analysis approach described here can inform and build First Nations' governance and capacity (Taylor & Biddle, 2004; Walter, 2018). It can also inform land

and water policies and ambitions of First Nations, shape sensitive planning and policy development that is responsive to their needs, and support and provide important benchmarks for use in future monitoring and evaluation.

State water registers and reporting

We encountered several challenges relating to state water registers, water reporting and water accounting. While these are relevant for State and Territory governments, they are also significant for the MDBA. This is because the Basin Plan includes an objective to "minimise transaction cost on water trades, *including through good information flows in the market and compatible entitlement, registry, regulatory and other arrangements across jurisdictions*" (cl 5.07(1)(b), emphasis added). Additionally, the MDBA may request State and Territory governments to carry out any measuring, monitoring, or recording within their geographical limits that the Authority considers necessary (*Water Act 2007* (Cth), s 172(2)). Therefore, we recommend that both the MDBA, as well as State and Territory governments, address the points raised here to enhance the accuracy of insights into Aboriginal-held water entitlements.

We note that the ACCC's current inquiry into water markets in the MDB is examining some of the water register and reporting points that we include here (see ACCC, 2020). It is important that our observations are considered alongside the findings and recommendations from this inquiry.

The first set of issues pertains to State and Territory water registers. Alongside issues with the accuracy of the information recorded and reported in these registers, Seidl et al. (2020) recently observed that:

> in contrast to land registers, water ownership registers are not accessible publicly. Individual water licence information is often behind a pay-per-record paywall, making it difficult to discern the size and value of various water holdings. This is complicated by the fact that authorities often require stakeholders' permission to share water licence information, even in case of paid requests. (p. 4).

The first type of challenge we observed from using the registers was the inter-jurisdictional differences. This included, but was not limited to, differences in search options, search prices, and in the information provided in search results. The challenge of navigating and understanding the different water entitlement and licencing regimes in each jurisdiction and their different searching interfaces poses an additional challenge.

The second issue was the tension between privacy requirements and rigorous search capabilities. As noted in Section 3, allowing name-based searches, as is possible in NSW and Queensland, means that the searcher can have less information to begin with. Where this is not possible, as in Victoria and SA, searchers are required to have a threshold level of information (i.e. water entitlement numbers) before any searching can occur. Assuming you have an unlimited budget, the former option facilitates more rigorous searching and is more likely to generate a more comprehensive baseline. In conducting research and inquiries that contributed to this report, we found some stakeholders (such as some Basin State Governments and some First Nations organisations) appreciated this level of transparency, while others were opposed to it, citing privacy and confidentiality reasons. Recognising that there are different preferences and positions on these issues is important.

A third problem arose when using water register searches to identify and track historical change. Of the Basin jurisdictions, only NSW water registers offer some capacity to track past water holding

changes and transfers, in that name-based searches yield current and previously held water entitlement information. However, the utility of this capacity is constrained by several features:

- Limited history: Only water entitlements issued under the *Water Management Act 2000* arrangement are included. NSW issued these entitlements in a staggered approach, beginning in July 2004 for most major regulated rivers and finishing for all remaining surface water systems in the Basin in October 2012.[46]
- Cancelled entitlements: Some cancelled entitlements no longer appear on the register while others do. Some data may be attained if the entitlement reference number (different to the entitlement number) is known, and the information broker and/or State registry consultant is helpful.

In other words, it is difficult to identify (previously) Aboriginal-held entitlements that are now cancelled, especially where (a) they were transferred from Aboriginal-ownership prior to the current legislative arrangements and (b) the entitlement was not previously identified (i.e. such as in Altman & Arthur's 2009 baseline).

Future monitoring of Aboriginal water holdings will be difficult and/or weakened without systematic and reliable means to accurately trace water entitlement transfers and cancellations. Indeed, the complete lack of capacity to search for historical water holdings and transfers in public water registers in most jurisdictions undermined our ability to identify and describe changes to Aboriginal water holdings over the last 10 years in much detail. Changes were reported where possible based on the only other benchmarking of Aboriginal water holdings across Australia (Altman & Arthur, 2009).

We make several recommendations in light of these water register issues. First, stakeholders (especially representatives from relevant Federal and State agencies) would benefit from a facilitated discussion about their goals and priorities regarding these search functions. Second, it could be worth reviewing different jurisdictions' privacy requirements to gain a better understanding of why such diverse arrangements are in place. Third, we encourage government agencies to develop cooperative and innovative approaches and agreements to share information, especially where this is likely to contribute to greater First Nation involvement and advancement in water reform, while simultaneously upholding important privacy and confidential legal requirements and other obligations on the other. Fourth, water registers should consider tracking and reporting water title transfers, akin to land titles, including where those water holdings have been cancelled.

There are other water reporting and accounting inconsistencies and challenges. We have noted already the lack of consistent information about long-term water allocations, and how this can undermine descriptions and comparisons of the reliability and security of different water entitlements across the Basin (Interim Inspector-General of MDB Water Resources, 2020). Should further research into the comparative reliability of different water entitlement types be developed in response to the Interim Inspector-General's (2020) findings, we recommend that the implications for Aboriginal water access be examined.

Adding to this is the diverse water valuation methods used by different practitioners across the Basin (and a scarcity of information about those methods). No state water registers report water valuations, only the sale price that individual sales yielded but these too are frequently erroneous (Seidl et al., 2020). Because of these issues, we reiterate that the market valuations provided in this

[46] Entitlements under the former *Water Act 1912* (NSW) are not included. For land, properties held after 1 June 1971 are listed.

report are indicative estimates only. Paying attention to and addressing these issues could help to improve the accuracy of future analyses of Aboriginal water holdings and their market value.

Furthermore, to aid and improve the accuracy of future Aboriginal water baselining exercises, LTDLE factors—or some other, alternative mechanisms—should be developed for all entitlement types to facilitate comparison across *all* different entitlements, not just those that have been recovered by governments for the environment. This should include unregulated entitlements and groundwater entitlements. Moreover, as new and improved information and modelling continue to come to light and efficiency projects continue to be developed, it is likely that surface water LTDLE factors, BDLs and SDLs values may change through to 2024 (MDBA, 2020a). Future Aboriginal water holdings assessments should pay attention to and account for these slight changes when comparing results with those presented in this report.

Water redistribution policies and programs

Given that Australian governments committed to improving Aboriginal water access under national policy in 2004, the findings of this report demand urgent attention and policy redress. Although the MDBA itself does not issue water entitlements, it is charged with supporting, encouraging and conducting research and investigations about the Basin water resources, including the equitable, efficient and sustainable use of Basin water resources and developing, or assisting the development of measures that help to achieve this (*Water Act 2007* (Cth) s 172(1)). We hope that State and Territory governments will act on these recommendations.

Policy discussions and programs which aim to reallocate water to Aboriginal peoples are under development in the MDB at both the Federal and (some) State and Territory scales. For example:

- In 2018, the Australian Government committed A$40million to purchase water entitlements for cultural and economic uses for MDB Aboriginal communities as part of Basin Plan negotiations (DAWR, 2018) (discussed more below).
- In 2016, the Victorian Government committed to investing A$5million and working in partnership with TOs to “develop a roadmap for access to water for economic development” (Victoria DELWP, 2016).
- In late 2018, legislative changes expanded the Indigenous Land Corporation’s (ILC) remit from only land-related support to now include supporting and funding water-related projects too (ILSC, 2018).
- The Queensland Government has committed to develop a process for granting water entitlements for currently unallocated water reserves to First Nations for any purpose (DNRME, 2019).

While no water has yet been reallocated to Aboriginal peoples inside the MDB through these policies,[47] it is clear that they will be difficult to implement if such reallocations were to impact upon existing water users’ rights and entitlements (National Irrigators' Council, 2017; Productivity Commission, 2017). The water market provides a potential mechanism to ensure this (Macpherson; 2019; McAvoy, 2006; Productivity Commission, 2017) and recent research has indicated public support for this kind of water redistribution to Aboriginal peoples (Jackson et al., 2019). That study surveyed households from the jurisdictions of the MDB and found that 69.2% of respondents

[47] In November 2020, the Victorian Government handed back 2 GL water entitlement to the Gunaikurnai Land and Waters Aboriginal Corporation in south-eastern Victoria (see McDonald & O’Donnell, 2020).

support the principle of reallocating a small amount of water from irrigators to Aboriginal people via the water market (Jackson et al., 2019).

Undoubtedly, the financial costs of securing water entitlements on the market for Aboriginal peoples is expected to be significant (Behrendt & Thompson, 2004; Downey & Clune, 2020; Jackson & Langton, 2012; Jackson & Morrison, 2007; McAvoy 2006; 2008). The significance of this is revealed in the fact that the Australian Government's A$40 million commitment to purchase water for Aboriginal people for economic and cultural purposes equates to just 0.2% of the market value of all entitlements in the MDB (in 2015-16 terms). Assuming that there are no changes to the Aboriginal water holdings we document here (worth A$19.2 million), and that all A$40 million is spent only on additional water entitlements, with no administration or other costs (we will come back to this shortly); this expenditure would see Aboriginal water holdings more than triple in value to A$58.4 million. While this seems like a significant increase, Aboriginal water holdings would still only constitute 0.35% of the market value of all entitlements in the MDB (in 2015-16 terms).

However, several issues need further consideration when making these crude estimates. First, as previously mentioned, current Aboriginal water holdings are disproportionately unregulated and less reliable than other water holdings. In determining which water entitlements should be purchased for First Nations, the reliability and security of the entitlements needs to be considered alongside Aboriginal peoples' water use preferences and goals.

Second, the value of the MDB water market is appreciating over time (Aither, 2019; BOM, 2020; Seidl et al., 2020).[48] This means that less water will be recoverable with the $40 million compared to May 2018 when the funds were pledged. The longer purchasing action is delayed, the smaller the volume of water that can likely be purchased and/or at lower security.

Third, any policies or programs aimed at facilitating Aboriginal self-determination regarding water and its use must be comprehensive and address more than only water rights acquisition. Other such matters include, but are not limited to, costs from administering and distributing the funding, transaction fees in the acquisition transactions, ongoing licencing fees and usages fees, and infrastructure acquisition and maintenance costs. Factors relating to land access and use are also inseparable from water access matters (see Hartwig et al., 2020; In review). Further, capacity, resourcing and support that are tailored to Aboriginal water use preferences are needed, as is investment in Aboriginal peoples' water (market) literacy. The importance of addressing *all* these aspects is emphasised when we recall that Hartwig et al. (2020) found a 17.2% decline in Aboriginal water holdings in the NSW portion of the MDB between 2009 and 2018, largely due to liquidation of Aboriginal organisations. Governments should collectively make every effort to prevent further declines in Aboriginal water holdings.

In a system like the MDB, where most surface water systems are fully allocated, groundwater may present a possible option for increasing Aboriginal water access, use, and engagement in water trading. Many groundwater sources across the Basin are not fully committed, meaning they have capacity for additional volumetric water entitlements to be issued potentially at a lesser cost than buying surface water entitlements on the open water market. Groundwater access is not dependent on river frontage or access to irrigation channels and so may be more accessible for more Aboriginal landholders, wherever they may exist.

[48] For example, the total market value of all entitlements on issue is likely much larger than $16.5 billion given that Aither (2019) estimated the total market value of only the 11 "major" surface water entitlements in 2018/19 in the Southern Basin at approximately $22.7 billion.

Several significant caveats, however, accompany this observation. First, any such approach needs to account for First Nations' perspectives and priorities about further development of and extraction from groundwater and aquifer sources. For example, evidence from 2017 consultation with First Nations about proposed amendments to increase SDLs for some groundwater sources,[49] as well as literature (see Moggridge, 2020), indicates that this option may not be widely supported. Aboriginal ownership of groundwater entitlements does not necessarily mean that water has to extracted or traded, though. In fact, holding entitlements to groundwater (or, indeed, surface water) may be a means to protect water from extraction by others and may be supported by First Nations.

In addition, institutional, physical, and location-specific factors may complicate or undermine the feasibility of Aboriginal communities using and benefiting from using (i.e. extracting) groundwater. First, to be eligible to access and benefit from groundwater, Aboriginal people must hold, or have legal access to, land. Hartwig et al. (In review) show that Aboriginal landholdings in the MDB are still extremely small, at least in the NSW portion where they are less than 1% of the land area. Low rates of Aboriginal land ownership may undermine this potential means of improving access. Second, although new access entitlements to groundwater sources may be more promising hypothetically, not *all* aquifers have unassigned or available water. If Aboriginal-held land is located above a fully assigned groundwater source, then an entitlement could be acquired only via the open market.

Third, should the above conditions be met, installation of a bore may be required, which can cost $10,000-$15,000 or more, depending on the depth required (and other factors). Fourth, accessing and extracting water from aquifers can be expensive, even after a bore is installed. Reasons for this are varied and location specific, but may include difficulties in pumping and accessing, lower yield rates, and/or water quality (i.e. salinity) issues. Altogether, these barriers, costs and water quality challenges may undermine the feasibility of Aboriginal communities' water use and benefit aspirations.

There is also the potential for Aboriginal people to benefit from groundwater through water trade. However, groundwater trading is not as well developed as surface water trading in the MDB, and in some regions, is not possible at all.[50]

Recent Basin developments

Some Basin State governments are coming to appreciate the need for broad and comprehensive responses to the problems facing Aboriginal people in accessing water. For example, the Victorian Government's Aboriginal Water Program, advocates that while Aboriginal water ownership is important, there also needs to be a greater emphasis and investment in other, related areas to support genuine progress and self-determination in Aboriginal water reform including:

1. **Enhancing water literary** for Traditional Owner and Aboriginal organisations with a particular emphasis on the rules and costs associated storage and delivery of water.
2. **Delivery mechanisms** – given much of the Basin is highly regulated, the ability for Traditional Owners (like the environment) to get water to where they want it may be problematic. They may need to access and/or install pumps, regulators and/or channels to deliver and manage water to achieve the desired outcomes.
3. **Capacity enhancement** within Traditional Owner and Aboriginal organisations so that once they have water, they know their options for using and managing it. This could be cultural, spiritual, environmental, or economic outcomes through on-ground projects and trials.

[49] These amendments ultimately passed in 2018 and mean that the Basin Plan now has a Basin-wide groundwater SDL that is 40% greater than the BDL (Grafton, 2019).

[50] See Hartwig (2020) for a review of key opportunities and challenges that Aboriginal entities face when trading surface water, many of which are likely of relevance for groundwater trade.

4. **Shared benefits** – achieving Traditional Owner and Aboriginal outcomes through the use of other water (e.g. water for the environment). If there are ways of achieving Traditional Owner or Aboriginal outcomes without the trappings of owning water, then those options and opportunities should be made available for Traditional Owners to self-determine if it meets their needs.
5. **Broader natural resource management (NRM) activities** – many Traditional Owner groups have stated they want greater involvement and influence in NRM activities to complement their use and/or ownership of water. The Victorian Aboriginal Water Program has heard that management of land and water cannot be separated and is part of Traditional Owner fabric. So, more needs to be invested in this area for them to better partner with local NRM bodies.
6. **Expanding participation and employment in the water sector** for Aboriginal Victorians, with an emphasis on opportunities for Traditional Owners and Aboriginal Victorians in water agency, planning and decision-making.

Victoria's Aboriginal Water Program tackling the above and, according to the Department, is making progress in partnership with Traditional Owner organisations, MLDRIN and the Federation of Victorian Traditional Owner Corporations (Paulo Lay, Principal Manager Community Partnerships, DELWP, *pers comm*, 16 April 2020).

Under the Water for Victoria Plan, the Victorian Government in 2016 made a number of commitments relating to Aboriginal involvement in water planning and water access that have supported this progress. An example resource made available through this funding is the *Water Access for Victorian Traditional Owner Economic Development* program. This work is being undertaken as a co-design process with Traditional Owners, peak bodies (MLDRIN and the Federation of Victorian Traditional Owner Corporations), and the Victorian Government. It will provide a clear statement of Traditional Owner interests in and aspirations for water management, including not only economic development but also for cultural, spiritual, and social purposes (O'Donnell, 2019). This will inform future program development in Victoria.

Additionally, the Queensland Government is developing a process for Aboriginal people to apply for unallocated groundwater that can be used for any purpose as desired and determined by the Aboriginal holders (DNRME, 2019). Work is underway to design and implement the process for granting entitlements from these unallocated reserves to First Nations and is due to be completed within two years of relevant water plans commencing (DNRME, 2019).

We urge other policymakers and government staff such as those at the MDBA and State- and Territory-based water agencies, to pay close attention to the outcomes of these Victorian and Queensland developments. In partnership with First Nations representatives, agency staff should consider the suitability of similar models and key lessons for application elsewhere.

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Appendix A: 2016 population baseline

Table 12: 2016 ERP data for the MDB, by SDL resource units

State	Region	Surface Water SDL resource unit	Code	Indigenous ERP	Total ERP	Proportion of total MDB Indigenous population (%)	Indigenous population as proportion of total SDL resource unit population (%)
Queensland	Northern MDB	Queensland Border Rivers	SS24	1,133	23,010	0.9	4.9
		Moonie	SS25	69	888	0.1	7.8
		Condamine–Balonne	SS26	12,478	216,875	10.4	5.8
		Nebine	SS27	68	1,095	0.1	6.2
		Warrego	SS28	1,138	5,869	0.9	19.4
		Paroo	SS29	24	267	0.0	9.0
New South Wales		NSW Border Rivers	SS23	3,447	30,951	2.9	11.1
		Gwydir	SS22	4,017	24,810	3.3	16.2
		Namoi	SS21	13,804	98,352	11.5	14.0
		Macquarie-Castlereagh	SS20	25,542	206,042	21.2	12.4
		Intersecting Streams	SS17	3,019	10,905	2.5	27.7
		Barwon-Darling Watercourse*	SS19	n/a	n/a	n/a	n/a
New South Wales	Southern MDB	Lachlan	SS16	8,051	96,223	6.7	8.4
		NSW Murray	SS14	3,290	98,064	2.7	3.4
		Lower Darling	SS18	3,530	27,854	2.9	12.7
		Murrumbidgee	SS15	13,778	248,170	11.4	5.6
ACT		ACT	SS1	7,456	402,584	6.2	1.9
Victoria		Victorian Murray	SS2	4,248	112,235	3.5	3.8
		Kiewa	SS3	1,284	47,875	1.1	2.7
		Ovens	SS4	709	49,996	0.6	1.4
		Broken	SS5	328	18,192	0.3	1.8
		Goulburn	SS6	3,987	138,997	3.3	2.9
		Campaspe	SS7	956	55,911	0.8	1.7
		Loddon	SS8	2,863	147,811	2.4	1.9
		Wimmera-Mallee	SS9	1,106	63,491	0.9	1.7
South Australia		SA Non-Prescribed Areas	SS10	2,794	63,836	2.3	4.4
		SA Murray	SS11	192	7,519	0.2	2.6
		Marne Saunders	SS12	13	1,453	0.0	0.9
		Eastern Mount Lofty Ranges	SS13	1,163	52,848	1.0	2.2

Note: * The Barwon-Darling Watercourse SDL resource unit only includes the watercourse i.e. the river channel, where no one lives.

Table 13: 2016 ERP data for the MDB, by Water Resource Plan area

State	Region	Surface Water Water Resource Plan area	Code	Indigenous ERP	Total ERP	Proportion of total MDB Indigenous population (%)	Indigenous population as proportion of total WRP area population (%)
Qld	Northern Basin	Queensland Border Rivers–Moonie	SW17	1,202	23,898	1.0	5.0
		Condamine–Balonne	SW19	12,478	216,875	10.4	5.8
		Warrego–Paroo–Nebine	SW20	1,230	7,231	1.0	17.0
NSW		NSW Border Rivers	SW16	3,447	30,951	2.9	11.1
		Gwydir	SW15	4,017	24,810	3.3	16.2
		Namoi	SW14	13,804	98,352	11.5	14.0
		Macquarie-Castlereagh	SW11	25,542	206,042	21.2	12.4
		Intersecting Streams	SW13	3,019	10,905	3	27.7
		Barwon-Darling Watercourse*	SW12	n/a	n/a	n/a	n/a
	Southern Basin	Lachlan	SW10	8,051	96,223	6.7	8.4
		NSW Murray and Lower Darling	SW8	6,820	125,918	5.7	5.4
		Murrumbidgee	SW9	13,778	248,170	11.4	5.6
ACT		ACT	SW1	7,456	402,584	6.2	1.9
Vic		Victorian Murray	SW2	4,248	112,235	3.5	3.8
		Northern Victoria	SW3	10,127	458,782	8.4	2.2
		Wimmera-Mallee	SW4	1,106	63,491	0.9	1.7
SA		SA Murray Region	SW5	2,794	63,836	2.3	4.4
		SA River Murray	SW6	192	7,519	0.2	2.6
		Eastern Mount Lofty Ranges	SW7	1,176	54,301	1.0	2.2

Note: * The Barwon-Darling Watercourse WRP area only includes the watercourse i.e. the river channel, where no one lives.

Table 14: 2016 ERP data for the MDB, by State and Territory portions of the Basin

State or Region	Indigenous ERP	Total ERP	Proportion of total MDB Indigenous population (%)	Indigenous population as proportion of total area population (%)
Queensland*	14,910	248,004	12.4	6.0
New South Wales	78,478	841,371	65.1	9.3
Australian Capital Territory	7,456	402,584	6.2	1.9
Victoria	15,481	634,508	12.8	2.4
South Australia	4,162	125,656	3.5	3.3
Northern MDB (inc Vic in baseline)	64,739	619,064	53.7	10.5
Northern Basin (exc Vic from baseline)	64,739	619,064	61.7	10.5
Southern MDB (inc Vic in baseline)	55,748	1,633,059	46.3	3.4
Southern MDB (exc Vic from baseline)	40,267	998,551	38.3	4.0
TOTAL MDB (inc Vic in baseline)	120,487	2,252,123	100	5.3
TOTAL MDB (exc Vic from baseline)	105,006	1,617,615	100	6.5

Appendix B: 2020 Aboriginal surface water holdings baseline

Table 15: 2020 Aboriginal surface water holdings data, per SDL resource unit

State	Region	Surface Water SDL resource unit	Code	Total water holdings (GL/y) [BDL]	Aboriginal water holdings (standardised) (GL/y)	Aboriginal % of total BDL water holdings (%)	Water recovered for environment (GL/y)	Water recovered for environment as % of BDL (%)	SDL water holdings (GL/y) [SDL]	Aboriginal water holdings (GL/y)	Aboriginal % of water holdings per SDL (%)
Queensland	Northern MDB	Queensland Border Rivers	SS24	246	0	0	13.3	5.4	232.0	0	0
		Moonie	SS25	36.8	0	0	2.5	6.8	34.7	0	0
		Condamine–Balonne*	SS26	601	0	0	87.4	14.5	501.0	0	0
		Nebine	SS27	9.5	0	0	3.8	40.0	5.7	0	0
		Warrego	SS28	59.1	0	0	20.1	34.0	39.0	0	0
		Paroo	SS29	0.2	0	0	0	0	0.2	0	0
New South Wales		NSW Border Rivers	SS23	204.7	0.030	0.01	1.9	0.9	197.7	0.030	0.02
		Gwydir	SS22	307.4	0.031	0.01	54.6	17.8	257.8	0.031	0.01
		Namoi	SS21	323.7	0.205	0.06	10.5	3.2	303.7	0.205	0.07
		Macquarie-Castlereagh	SS20	424.3	0.047	0.01	95.8	22.6	366.7	0.047	0.01
		Intersecting Streams	SS17	16.8	0.023	0.14	13.8	82.1	3.0	0.023	0.78
		Barwon-Darling Watercourse	SS19	186.5	2.348	1.26	30.1	16.1	154.5	2.348	1.52
	Southern MDB	Lachlan	SS16	302.4	0.227	0.08	46.7	15.4	254.4	0.227	0.09
		NSW Murray	SS14	1,707.7	4.225	0.25	292.8	17.1	1392.2	4.225	0.30
		Lower Darling	SS18	55.0	0.902	1.64	23.2	42.2	32.7	0.902	2.76
		Murrumbidgee	SS15	2,117.0	3.954	0.19	435.2	20.6	1547.9	3.954	0.26
ACT		ACT (surface water)	SS1	42.7	0	0	0	0	37.8	0	0
Victoria		Victorian Murray	SS2	1,662.1	unavailable	unavailable	392.8	23.6	1263.8	unavailable	unavailable
		Kiewa	SS3	11	unavailable	unavailable	0	0	11.1	unavailable	unavailable
		Ovens	SS4	25.4	unavailable	unavailable	0.1	0.4	25.4	unavailable	unavailable
		Broken	SS5	13.2	unavailable	unavailable	0.4	3.0	12.9	unavailable	unavailable
		Goulburn	SS6	1,580.4	unavailable	unavailable	367.9	23.3	1207.0	unavailable	unavailable
		Campaspe	SS7	112.6	unavailable	unavailable	28.9	25.7	83.7	unavailable	unavailable
		Loddon	SS8	88.6	unavailable	unavailable	12.3	13.9	76.6	unavailable	unavailable
		Wimmera-Mallee (surface water)	SS9	68.2	unavailable	unavailable	23.2	34.0	45.2	unavailable	unavailable
South Australia		SA Non-Prescribed Areas	SS10	0	0	0	0	0	0	0	0
		SA Murray	SS11	681.1	0.782	0.11	141	21	542.8	0.782	0.14
		Marne Saunders	SS12	0	0	0	0	0	0	0	0
		Eastern Mount Lofty Ranges	SS13	15.3	0	0	0	0	15.3	0	0

Notes: Water recovered for the environment data from 31 March 2020 (MDBA, 2020b). *Water recovery in the Condamine-Balonne in Queensland is associated with take by floodplain harvesting (Carol Bruce, Assistant Director, Surface Water, SDL Accounting & Aboriginal Partnerships Branch, MDBA, *pers comm*, 6 May 2020). BDL and SDL data is determined using only equivalent takes (i.e. "take from a regulated river" and "take from a watercourse") and based on 2019/20 water year estimates (MDBA, 2019c, 2019d).

Table 16: 2020 Aboriginal surface water holdings data, per Water Resource Plan Area

State	Region	Surface Water Water Resource Plan area	Code	Total water holdings (GL/y) [BDL]	Aboriginal water holdings (standardised) (GL/y)	Aboriginal % of total BDL water holdings (%)	Water recovered for environment (GL/y)	Water recovered for environment as % of BDL (%)	SDL water holdings (GL/y) [SDL]	Aboriginal water holdings (GL/y)	Aboriginal % of water holdings per SDL (%)
Queensland	Northern Basin	Queensland Border Rivers–Moonie	SW17	282.8	0	0	15.8	5.6	266.7	0	0
		Condamine–Balonne*	SW19	601.0	0	0	87.4	14.5	501.0	0	0
		Warrego–Paroo–Nebine	SW20	68.8	0	0	23.9	34.7	44.9	0	0
New South Wales		NSW Border Rivers	SW16	204.7	0.030	0.01	1.9	0.9	197.7	0.030	0.02
		Gwydir	SW15	307.4	0.031	0.01	54.6	17.8	257.8	0.031	0.01
		Namoi	SW14	323.7	0.205	0.06	10.5	3.2	303.7	0.205	0.07
		Macquarie-Castlereagh	SW11	424.3	0.047	0.01	95.8	22.6	366.7	0.047	0.01
		Intersecting Streams	SW13	16.8	0.023	0.14	13.8	82.1	3.0	0.023	0.78
		Barwon-Darling Watercourse	SW12	186.5	2.348	1.26	30.1	16.1	154.5	2.348	1.52
	Southern Basin	Lachlan	SW10	302.4	0.227	0.08	46.7	15.4	254.4	0.227	0.09
		NSW Murray and Lower Darling	SW8	1,762.7	5.127	0.29	316.0	17.9	1,424.9	5.127	0.36
		Murrumbidgee	SW9	2,117.0	3.954	0.19	435.2	20.6	1,547.9	3.954	0.26
ACT		ACT (surface water)	SW1	42.7	0	0	0	0	37.8	0	0
Victoria		Victorian Murray	SW2	1,662.1	unavailable	unavailable	392.8	23.6	1,263.8	unavailable	unavailable
		Northern Victoria	SW3	1,831.2	unavailable	unavailable	409.6	22.4	1,416.7	unavailable	unavailable
		Wimmera-Mallee (surface water)	SW4	68.2	unavailable	unavailable	23.2	34.0	45.2	unavailable	unavailable
South Aus.		SA Murray Region	SW5	0	0	0	0	0	0	0	0
		SA River Murray	SW6	681.1	0.8	0.11	141.0	20.7	542.8	0.8	0.14
		Eastern Mount Lofty Ranges	SW7	15.3	0	0	0	0	15.3	0	0

Notes: Water recovered for the environment data from 31 March 2020 (MDBA, 2020b). *Water recovery in the Condamine-Balonne in Queensland is associated with take by floodplain harvesting (Carol Bruce, Assistant Director, Surface Water, SDL Accounting & Aboriginal Partnerships Branch, MDBA, *pers comm*, 6 May 2020). BDL and SDL data is determined using only equivalent takes (i.e. "take from a regulated river" and "take from a watercourse") and based on 2019/20 water year estimates (MDBA, 2019c, 2019d).

Table 17: 2020 Aboriginal surface water holdings data, per State and Territory portions of the Basin

State or Region	Total water holdings (GL/y) [BDL]	Aboriginal water holdings (standardised) (GL/y)	Aboriginal % of total BDL water holdings (%)	Water recovered for environment (GL/y)	Water recovered for environment as % of BDL (%)	SDL water holdings (GL/y) [SDL]	Aboriginal water holdings (GL/y)	Aboriginal % of water holdings per SDL (%)
Queensland*	952.6	0	0	127.1	13.3	812.6	0	0
New South Wales	5,645.5	11.992	0.212	1,004.6	17.8	4,510.6	11.992	0.266
Australian Capital Territory	42.7	0	0	0	0	37.8	0	0
Victoria	3,561.5	unavailable	unavailable	825.6	23.2	2,725.7	unavailable	unavailable
South Australia	696.4	0.782	0.112	141.0	20.2	558.1	0.782	0.140
Northern MDB	2,416	2.684	0.11	334	13.8	2,096	2.684	0.13
Southern MDB (inc Vic in baseline)	8,483	10.090	0.12	1,765	20.8	6,549	10.090	0.15
Southern MDB (exc Vic from baseline)	4,921	10.090	0.21	939	19.1	3,823	10.090	0.26
TOTAL MDB (inc Vic in baseline)	10,899	12.774	0.12	2,098	19.3	8,645	12.774	0.15
TOTAL MDB (exc Vic from baseline)	7,337	12.774	0.17	1,273	17.3	5,919	12.774	0.22

Notes: Water recovered for the environment data from 31 March 2020 (MDBA, 2020b). * Water recovery in the Condamine-Balonne in Queensland is associated with take by floodplain harvesting (Carol Bruce, Assistant Director, Surface Water, SDL Accounting & Aboriginal Partnerships Branch, MDBA, *pers comm*, 6 May 2020). BDL and SDL data is determined using only equivalent takes (i.e. "take from a regulated river" and "take from a watercourse") and based on 2019/20 water year estimates (MDBA, 2019c, 2019d).

Appendix C: 2020 Aboriginal groundwater holdings baseline

Table 18: Key inputs for groundwater workings for SDL resource units

State	SDL resource unit	Code	SDL (GL/y)	Take under basic rights (BR) (GL/y)	Volume of water access entitlements (WAE) (GL/y)	Volume of WAE+BR (GL/y)	Comparison ratio	Available groundwater resource (GL/y)
Queensland	Queensland Border Rivers Alluvium	GS54	14.0	1.09	19.0	20.1	*0.70*	14.0
	Queensland Border Rivers Fractured Rock	GS55	10.5	0.98	7.8	8.8	*1*	8.8
	Sediments above the GAB: Border Rivers-Moonie	GS57	46.9	0.27	0.2	0.5	*1*	0.5
	St George Alluvium: Moonie	GS62	0.69	0.02	0.0	0.0	*1*	0.0
	Condamine Fractured Rock	GS53	1.48	0.23	0.4	0.6	*1*	0.6
	Queensland MDB: deep	GS56	100.0	0.00	0.0	0.0	*1*	0.0
	Sediments above the GAB: Condamine-Balonne	GS58	18.1	0.16	0.3	0.4	*1*	0.4
	St George Alluvium: Condamine-Balonne (shallow)	GS61a	27.7	0.21	0.1	0.3	*1*	0.3
	St George Alluvium: Condamine-Balonne (deep)	GS61b	12.6	0.10	11.8	11.9	*1*	11.9
	Upper Condamine Alluvium (Central Condamine Alluvium)	GS64a	46.0	4.46	83.0	87.4	*0.53*	46.0
	Upper Condamine Alluvium (Tributaries)	GS64b	40.5	2.63	40.4	43.0	*0.94*	40.5
	Upper Condamine Basalts	GS65	79.0	13.2	61.1	74.3	*1*	74.3
	Sediments above the GAB: Warrego-Paroo-Nebine	GS60	99.2	0.59	0.2	0.7	*1*	0.7
	St George Alluvium: Warrego-Paroo-Nebine	GS63	24.6	0.08	0.0	0.1	*1*	0.1
	Warrego Alluvium	GS66	10.2	0.47	0.3	0.8	*1*	0.8
New South Wales	Western Porous Rock	GS50	226.0	26.7	35.9	62.7	*1*	62.7
	Gunnedah-Oxley Basin MDB	GS17	127.5	5.78	23.6	29.4	*1*	29.4
	Sydney Basin MDB	GS41	19.1	0.47	5.4	5.9	*1*	5.9
	Oaklands Basin	GS38	2.50	0.00	0.0	0.0	*1*	0
	Lower Darling Alluvium	GS23	2.23	0.73	0.9	1.7	*1*	1.7
	Upper Darling Alluvium	GS42	6.59	2.76	3.5	6.3	*1*	6.3
	Billabong Creek Alluvium	GS13	7.50	0.64	6.8	7.5	*1*	7.47
	Lower Murray Shallow Alluvium	GS27a	81.9	0.99	77.8	78.7	*1*	78.7
	Lower Murray Deep Alluvium	GS27b	88.9	1.53	84.8	86.3	*1*	86.3
	Upper Murray Alluvium	GS46	14.1	0.40	41.2	41.6	*0.34*	14.1
	Lake George Alluvium	GS21	1.27	0.03	1.2	1.26	*1*	1.26
	Lower Murrumbidgee Shallow Alluvium	GS28a	26.9	3.00	5.2	8.2	*1*	8.2
	Lower Murrumbidgee Deep Alluvium	GS28b	273.6	1.00	275.4	276.4	*0.99*	273.6
	Mid-Murrumbidgee Alluvium	GS31	53.5	0.82	83.7	84.6	*0.63*	53.5
	Belubula Alluvium	GS12	2.88	0.04	8.2	8.3	*0.35*	2.9
	Lower Lachlan Alluvium	GS25	117.0	4.00	108.6	112.6	*1*	112.6
	Upper Lachlan Alluvium	GS44	94.2	6.28	174.4	180.6	*0.52*	94.2
	Adelaide Fold Belt MDB	GS10	6.90	2.14	2.2	4.3	*1*	4.3
	Inverell Basalt	GS18	4.15	1.07	3.1	4.15	*1*	4.15
	Kanmantoo Fold Belt MDB	GS19	18.7	8.15	0.8	8.9	*1*	8.9
	Lachlan Fold Belt MDB	GS20	259.0	75.5	73.3	148.8	*1*	148.8
	Liverpool Ranges Basalt MDB	GS22	2.16	1.83	0.4	2.3	*0.96*	2.16
	New England Fold Belt MDB	GS37	55.1	18.6	22.6	41.2	*1*	41.2
	Orange Basalt	GS39	10.7	1.16	9.8	11.0	*0.98*	10.7
	Warrumbungle Basalt	GS49	0.55	0.54	0.1	0.61	*0.90*	0.55

State	SDL resource unit	Code	SDL (GL/y)	Take under basic rights (BR) (GL/y)	Volume of water access entitlements (WAE) (GL/y)	Volume of WAE+BR (GL/y)	Comparison ratio	Available groundwater resource (GL/y)
	Young Granite	GS51	7.11	0.76	6.4	7.11	*1*	7.11
	Bell Valley Alluvium	GS11	3.29	0.01	4.8	4.8	*0.69*	3.29
	Castlereagh Alluvium	GS14	0.62	0.08	0.6	0.7	*0.93*	0.62
	Coolaburragundy-Talbragar Alluvium	GS15	3.47	0.07	6.0	6.1	*0.57*	3.47
	Cudgegong Alluvium	GS16	2.53	0.03	13.7	13.7	*0.18*	2.53
	Lower Macquarie Alluvium	GS26	52.7	0.55	51.5	52.1	*1*	52.1
	Upper Macquarie Alluvium	GS45	17.9	0.30	32.2	32.5	*0.55*	17.90
	NSW GAB Surat Shallow	GS34	15.5	0.98	5.8	6.8	*1*	6.8
	NSW GAB Warrego Shallow	GS35	33.4	0.65	0.0	0.7	*1*	0.7
	NSW GAB Central Shallow	GS36	8.83	1.16	0.5	1.6	*1*	1.6
	Lower Namoi Alluvium	GS29	88.3	3.30	86.0	89.3	*0.99*	88.3
	Manilla Alluvium	GS30	1.23	0.02	3.5	3.6	*0.35*	1.23
	Peel Valley Alluvium	GS40	9.34	0.24	51.9	52.2	*0.18*	9.34
	Upper Namoi Alluvium	GS47	123.4	2.83	116.1	118.9	*1*	118.9
	Upper Namoi Tributary Alluvium	GS48	1.77	0.03	3.9	3.9	*0.45*	1.77
	Lower Gwydir Alluvium	GS24	33.0	0.70	32.6	33.3	*0.99*	33.0
	Upper Gwydir Alluvium	GS43	0.72	0.07	1.2	1.3	*0.57*	0.72
	NSW Border Rivers Alluvium	GS32	8.40	0.24	15.9	16.1	*0.52*	8.40
	NSW Border Rivers Tributary Alluvium	GS33	0.41	0.13	1.6	1.7	*0.24*	0.41
ACT	**ACT (Groundwater)**	GS52	3.16	0.00	2.2	2.2	*1*	2.2
Victoria	**Goulburn-Murray: Shepparton Irrigation Region**	GS8a	244.1	2.50	185.0	187.5	*1*	187.5
	Goulburn-Murray: Highlands	GS8b	68.7	8.33	29.0	37.3	*1*	37.3
	Goulburn-Murray: Sedimentary Plain	GS8c	223.0	8.29	205.2	213.5	*1*	213.5
	Goulburn-Murray: deep	GS8d	20.0	0.11	4.1	4.2	*1*	4.2
	Wimmera-Mallee: Highlands	GS9a	2.75	0.18	2.4	2.5	*1*	2.5
	Wimmera-Mallee: Sedimentary Plain	GS9b	186.9	0.87	13.6	14.5	*1*	14.5
	Wimmera-Mallee: deep	GS9c	20.0	0.00	0.6	0.6	*1*	0.6
South Australia	**Mallee (Pliocene Sands)**	GS3a	41.4	0.00	NA	0.0	*1*	0
	Mallee (Murray Group Limestone)	GS3b	63.6	2.28	61.4	63.6	*1*	63.6
	Mallee (Renmark Group)	GS3c	2.00	0.00	NA	0.0	*1*	0
	Peake-Roby-Sherlock (unconfined)	GS5a	3.41	0.19	0.29	0.5	*1*	0.5
	Peake-Roby-Sherlock (confined)	GS5b	2.58	0.41	1.9	2.3	*1*	2.3
	SA Murray	GS6	64.8	1.80	NA	1.8	*1*	1.8
	SA Murray Salt Interception Schemes	GS7	28.6	0.00	NA	0.0	*1*	0
	Angas Bremer (Quaternary Sediments)	GS1a	1.09	0.00	NA	0.0	*1*	0
	Angas Bremer (Murray Group Limestone)	GS1b	6.57	0.08	9.0	9.0	*0.73*	6.57
	Eastern Mount Lofty Ranges	GS2	38.5	0.70	31.9	32.6	*1*	32.6
	Marne Saunders (Fractured Rock)	GS4a	2.09	0.09	2.0	2.07	*1*	2.07
	Marne Saunders (Murray Group Limestone)	GS4b	2.38	0.18	2.1	2.26	*1*	2.26
	Marne Saunders (Renmark Group)	GS4c	0.50	0.0	NA	0.0	*1*	0

Note: WAE and BR volumes are from 2018-19 data. Aboriginal groundwater holdings data is not presented at this level in the interest of confidentiality.

Table 19: 2020 Aboriginal groundwater holdings data, per Water Resource Plan Area

State	Groundwater Water Resource Plan area	Code	SDL (GL/y)	Take under basic rights (BR) (GL/y)	Volume of water access entitlements (WAE) (GL/y)	Volume of WAE+BR (GL/y)	Comparison ratio	Available groundwater resource (GL/y)	Aboriginal groundwater entitlements (GL)	Comparable volume of Aboriginal groundwater entitlements (GL)	Comparable volume of Aboriginal groundwater entitlements as a % of available groundwater resource (%)
Qld	**Queensland Border Rivers–Moonie**	GW19	72.1	2.4	27.1	29.5	*1*	27.1	0	0	0
	Condamine-Balonne	GW21	325.4	21.0	197.1	218.1	*1*	197.1	0	0	0
	Warrego–Paroo–Nebine	GW22	134.0	1.1	0.4	1.6	*1*	0.4	0	0	0
NSW	**NSW Murray-Darling Basin Porous Rock**	GW6	375.1	33.0	64.9	97.9	*1*	97.9	0	0	0
	Darling Alluvium	GW7	8.8	3.5	4.5	7.9	*1*	7.9	0	0	0
	Murray Alluvium	GW8	192.4	3.5	210.6	214.1	*0.90*	192.4	0	0	0
	Murrumbidgee Alluvium	GW9	355.3	4.8	365.6	370.4	*0.96*	355.3	0	0	0
	Lachlan Alluvium	GW10	214.1	10.3	291.2	301.5	*0.71*	214.1	0.059	0.042	0.020
	NSW Murray-Darling Fractured Rock	GW11	364.4	109.7	118.6	228.3	*1*	228.3	0.240	0.240	0.105
	Macquarie-Castlereagh Alluvium	GW12	80.5	1.0	108.8	109.8	*0.73*	80.5	0.039	0.029	0.036
	NSW Great Artesian Basin Shallow	GW13	57.7	2.8	6.3	9.1	*1*	9.1	0	0	0
	Namoi Alluvium	GW14	224.0	6.4	261.4	267.8	*0.84*	224.0	0.218	0.182	0.081
	Gwydir Alluvium	GW15	33.7	0.8	33.8	34.6	*1*	34.6	0	0	0
	NSW Border Rivers Alluvium	GW18	8.8	0.4	17.5	17.9	*0.49*	8.8	0	0	0
ACT	**ACT (groundwater)**	GW1	3.16	0.00	2.2	2.2	*1*	2.2	0	0	0
Vic	**Goulburn-Murray**	GW2	555.8	19.2	423.3	442.5	*1*	442.5	unavailable	unavailable	unavailable
	Wimmera-Mallee (groundwater)	GW3	209.7	1.0	16.6	17.6	*1*	17.6	unavailable	unavailable	unavailable
SA	**SA Murray Region**	GW4	206.4	4.68	63.6	68.24	*1*	68.2	0	0	0
	Eastern Mount Lofty Ranges	GW5	51.1	1.05	44.9	45.98	*1*	46.0	0	0	0

Note: WAE and BR volumes are from 2018-19 data.

Table 20: 2020 Aboriginal groundwater holdings data, per State and Territory portions of the Basin

State or Region	SDL (GL/y)	Take under basic rights (BR) (GL/y)	Volume of water access entitlements (WAE) (GL/y)	Volume of WAE+BR (GL/y)	Comparison ratio	Available groundwater resource (GL/y)	Aboriginal groundwater entitlements (GL)	Comparable volume of Aboriginal groundwater entitlements (GL)	Comparable volume of Aboriginal groundwater entitlements as a % of available groundwater resource (%)
Queensland*	531.5	24.4	224.7	249.1	*1*	249.1	0	0	0
New South Wales	1,914.9	176.3	1,483.1	1,659.4	*1*	1,659.4	0.556	0.556	0.034
Australian Capital Territory	3.16	0.00	2.2	2.2	*1*	2.2	0	0	0
Victoria	765.5	20.3	439.8	460.1	*1*	460.1	unavailable	unavailable	unavailable
South Australia	257.5	5.7	108.5	114.2	*1*	114.2	0	0	0
TOTAL MDB (inc Vic in baseline)	3,472.5	226.8	2,258.3	2,485.0	*1*	2,485.0	0.556	0.556	0.022
TOTAL MDB (exc Vic from baseline)	2,707.0	206.5	1,818.5	2,024.9	*1*	2,024.9	0.556	0.556	0.027

Note: WAE and BR volumes are from 2018-19 data.

Appendix D: Population estimate methodology

Dr Francis Markham from the Australian National University's Centre for Aboriginal Economic Policy Research (CAEPR) provided estimates of the Indigenous and non-Indigenous populations within the MDB. These were based on 2016 Estimated Residential Population (ERP) data published by the ABS. Estimated Residential Population data are not raw Census counts, but the population estimate once the ABS attempts to adjust for those missed by the Census (see Markham & Biddle, 2018).

Understanding the difference between Census counts and the Estimated Residential Population

It is important to understand the difference between the ERP and the raw Census population count, as these vary substantially for the Indigenous population in Australia. The raw Census count of the Indigenous population is produced by tabulating all the individuals about whom the question ''Is the person of Aboriginal or Torres Strait Islander origin?" was answered in the affirmative on their household census form. In the 2016 Census, 590,056 people were counted as Aboriginal, 32,345 were counted as Torres Strait Islander, and 26,767 were counted as both Aboriginal and Torres Strait Islander. Combined, 649,168 people were counted as Indigenous (Markham & Biddle, 2017).

However, Census counts are a poor measure of the Indigenous population for three main reasons. First, around 6% of census records do not have a response to the Indigenous status question indicated (i.e. Indigenous status "not stated"). This is primarily because no Census form was received from an occupied dwelling, but Census collectors "imputed" the presence of residents. It also occurs when the Indigenous status question is skipped over on the Census form. Second, some individuals have no record in the Census, not even an imputed one. This could be because they were incorrectly omitted from a completed Census form, because Census collectors missed their dwelling, or because Census collectors mistakenly thought their dwelling was unoccupied. Third, some people who have completed the Census question on Indigenous status may not disclose their Indigeneity, either as an intentional act of refusal (Andrews, 2018) or simply in error.

For this and other reasons, the ABS undertake a post-enumeration survey (PES) in the months after the Census is conducted. The PES is a household sample survey conducted by interviewers who can spend more time and effort to produce a high-quality population estimate. Around 0.5% of Australian households are reinterviewed for PES. The ERP is a survey-based estimated based on the PES (and a number of other minor adjustments that have little effect on Indigenous population estimates). The final Indigenous ERP in 2016 was 798,400 (ABS, 2019).

In other words, the ABS estimate that some 17.5% of Australia's Indigenous population are missed by the Census counts. This high Indigenous undercount has been longstanding for several decades and is not well understood (Markham & Biddle, 2018). The non-Indigenous undercount is much less substantial. For this reason, the ERP should be favoured when producing Indigenous population estimates.

Methods for producing ERPs for Surface Water SDL resource units

Markham tabulated the ERP data as per Surface Water SDL resource units (published March 2019, see MDBA, 2019e). Because the ERP is based on a sample survey, the smallest area for which Indigenous ERPs can be made by the ABS is the SA2. The ERPs were estimated using the following method:

1. SA2-based Indigenous versus non-Indigenous ERPs were obtained from the ABS website (ABS, 2018b).

2. SA2 ERPs were imputed for those few SA2s the ABS censored or did not include in these tables (i.e. SA2s in Other Territories including Jervis Bay, and non-geographic SA2s).

3. SA2-level undercount ratios were calculated by comparing SA2 ERPs and SA2 counts created by aggregating SA1-level Indigenous / non-Indigenous census counts (tabulated by place of usual residence).

3. The SA2-level undercount rates were applied to the SA1-level counts to produce SA1 pseudo ERPs.

4. An SA1 to MDB allocation table was produced by associating each SA1 with a single MDB Surface Water SDL resource unit. A GIS was used to produce an intersection table, showing the geographical area of each SDL resource unit that each SA1 overlapped. Each SA1 was assigned to the SDL resource unit that it had the greatest spatial overlap with. While the vast majority of SA1s only overlap a single SDL resource unit, this method was used to determine the allocation of SA1s on the border between two or more SDL resource units.

5. Surface Water SDL resource unit ERPs were tabulated by summing up the SA1 “pseudo ERPs” according to this SA1-based allocation table.

We acknowledge that there will be small errors associated with all of these steps, but they should be negligible at this level of analysis. These errors are smaller in magnitude than those in previously published estimates by Taylor and Biddle (2004), for example.

Appendix E: Limitations and assumptions to standardising surface water entitlements

While MDBA managers advised that using long-term diversion limit equivalence (LTDLE) factors would be the best way to compare water holdings with and across water sources, and within and across states, there are several assumptions and limitations to this method that must be acknowledged. Those detailed here focus only on those that are relevant to standardising Aboriginal water entitlements, but further assumptions and limitations about LTDLE factors more broadly are detailed in individual State-based LTDLE reports (for example, see NSW Department of Industry 2018a, 2018b, 2019a, 2019b; SA DEW, 2019; Victoria DELWP, 2019).

First concerns LTDLE factors for unregulated entitlements. Water access and extraction in unregulated systems has a unique history. Diversions are small in scale and water use was not metered until recently (NSW Department of Industry, 2018a). Because of this, "[n]o model and no historical record [is] available for estimating [LTDLE] take" under these entitlements in ways that are akin to regulated systems (NSW Department of Industry, 2018b, p. 42). Additionally, LTDLE factors are only developed for entitlement types that have been, or are proposed to be, recovered for environmental use through direct purchases or water savings infrastructure projects (SA DEW, 2019), which often has not included unregulated entitlements. In NSW, the NSW Department of Industry (2018b) nominated a LTDLE factor of 1.000 for unregulated entitlement types that have been recovered for environmental use. This assumption is deemed appropriate because only a very small volume of unregulated water has been recovered for environmental use, and so "the associated factors don't significantly affect the overall water recovery balance" (NSW Department of Industry, 2018a, p. 1). For the unregulated entitlements held by Aboriginal organisations without applicable LTDLE factors, we followed this assumption and similarly adopted a factor of 1.000. Other methods to establish new LTDLE factors for these sources are in development (NSW Department of Industry, 2018a) and should be adopted into the future.

Second, each LTDLE factor is *representative* of the average behaviour of *all* users or holders of the particular entitlement type based on long-term (i.e. historic) and *average* water use trends (NSW Department of Industry, 2018b, emphasis added). As such, they do not describe *actual* water use associated with specific entitlements, do not impact on water allocations (which are determined by state governments based on climatic and storage conditions), and do not predict future water use or behaviours (NSW Department of Industry, 2018b; SA DEW, 2019). These distinctions are important. Unrelated to these calculated LTDLE factors, it is possible for long-term water use to increase over time (MDBA, 2019b). The MDBA (2019b) has developed a *Sustainable Diversion Limit Reporting and Compliance Framework* to guide monitoring long-term water use trends, which includes specific mechanisms to address situations in which "growth-in use" trends are observed.

Third, this method relies upon calculated LTDLE factors, BDLs and SDLs, which are determined using the best information available (SA DEW, 2019). However, as new and improved information and modelling continue to come to light and efficiency projects continue to be developed, it is likely that LTDLE factors, BDLs and SDLs values may change through to 2024 (MDBA, 2020a). Where this occurs, some figures calculated for this report could also be slightly affected too.

Appendix F: Estimating market value of Aboriginal-held water entitlements

There are multiple water valuation methodologies (see Seidl et al., 2020) as well as variations in water pricing and sales which, together, create complexities for estimating and comparing market value estimates of water. That is, the dollar value of 1 ML of water in both the entitlement and allocation markets differs across water sources, as well as total sale volume, due in large part to regional differences in supply versus demand. For clarity and transparency (Seidl et al., 2020), we detail the method used for this valuation here, along with some associated assumptions and limitations. We reiterate that these valuations are estimates only, although believe them to be reasonable and justifiable given the available data.

To construct market value estimates, we sought out a data source that, for a single water year, included both:

1. an overall market value of all entitlements on issue across the Basin; and,
2. market values for individual entitlement types across the MDB including most, if not all, of those that are held by Aboriginal organisations (see Table 21 below).[51]

Data collected and compiled by BOM (2020) and ABARES (2018a) for the water year 2015-16 best met these criteria, though were not perfect as we consider below. While more recent data were available from ABARES (2018b) and BOM (2019) for individual entitlements on issue, a comparable overall estimate of water entitlement market value was not included in this report, and thus did not meet the first criterion. We also considered annual water market reports produced by consultants, Aither, especially as these include more recent data (see for example Aither, 2019). However, these reports focus on the value of the overall market and individual entitlements only within the southern MDB. This is indeed where most water trade in Australia occurs. For example, ABARES (2018a) estimated that in 2015-16, 81% of all Australian water trade occurred in this region. But several key Aboriginal-held water entitlement types are excluded by this focus. Thus, this data source did not meet the second criterion.

Table 21 lists all the Aboriginal-held entitlement types, together with relevant 2015-16 market pricing estimates, specifically, the volume-weighted average prices (VWAP), as calculated by BOM (2020). Where 2015-16 VWAPs were not available from this source—because an insufficient number of trades occurred in that water year—we calculated a VWAP for a 10-year period, where possible. Entitlements for which neither of these methods rendered a VWAP might be considered to be a part of a thin or illiquid market, and the absence of quality data for these entitlements is a known challenge (Seidl et al., 2020) particularly for some unregulated surface water and groundwater markets.[52] We multiplied these VWAPs by water entitlement volumes (rather than LTDLE volumes) because this is consistent with water entitlement sale processes.

[51] Excluding stock and domestic entitlements because they are not really considered part of the market and therefore the market's value.

[52] Seidl et al. (2020) report that some water valuing practitioners address this by "using water trade data from comparable water products in other regions (based on reliability) or property sales data" (p. 5), but we have not deployed such an approach here. Instead, the valuation estimates we provide are noted to be minimum estimates.

Table 21: VWAPs used to estimate the market values of Aboriginal water holdings

Water source*	Entitlement type	Volume-weighted average price ($/ML)	
		2015-16 VWAP	10 years (08-09 to 17-18)
Lachlan	GS	563.25	
Lower Darling	GS	1504.73	
Macquarie	GS	1,020.33	
Murrumbidgee	GS	1,235.20	
NSW Murray	GS	1,045.94	
Peel	GS	1,392.56	
Lachlan	HS	1,335.02	
Murrumbidgee	HS	3,339.66	
NSW Murray	HS	2,642.45	
Macquarie	SW	-	-
NSW Murray	SW	-	-
Murrumbidgee	SW (Lowbidgee)	-	-
Intersecting Streams*	UR	-	-
NSW Border Rivers*	UR	-	-
Macquarie*	UR	-	672.32
Gwydir*	UR	-	-
NSW Murray*	UR	-	332.91
Lachlan*	UR	-	-
Barwon-Darling	UR	748.1	
South Australian Murray	Class 3	2,189.18	
South Australian Murray	Class 5	4,390.17	
Lachlan Alluvium*	AQ	737.36	
Macquarie-Castlereagh Alluvium*	AQ	1082.97	
Namoi Alluvium*	AQ	1660.82	
NSW MDB Fractured Rock*	AQ	1354.20	

Source: Compiled from BOM (2020)

Notes: VWAP: Volume-weighted average price. GS: General Security entitlement. HS: High Security entitlement. SW: Supplementary Water entitlement. UR: Unregulated entitlement. AQ: Aquifer entitlement. *In the interest of confidentiality, rather than specific water sources, most UR are listed by SDL resource unit names and all AQ are listed by WRP area names.

There are limitations inherent in using 10-year VWAP measures. However, with no substitute available, we deemed this to be the best method. For example, an Aboriginal entity holds sizeable General Security entitlements in the Lower Darling, and so their inclusion in the overall Aboriginal water holdings value estimate was highly desirable. However, searching the NSW Water Register revealed there was not a single year between 2004-05 and 2017-18 when sufficient water trades occurred (minimum 10) for BOM to calculate a VWAP for this entitlement category. Recognising these limitations, the VWAPs provided are best regarded as an indicator of pricing that can be used to *estimate* the value of entitlement holdings.

ABARES's (2018a) overall estimated market value of water entitlements (of at least A$16.5 billion) includes both surface and groundwater entitlements across *all* Basin states (though only those considered "actively traded"). Caution must be observed, therefore, when comparing surface water

only and groundwater only estimates with this baseline. Finally, the value of water entitlements varies inter and intra annually based on market forces, making a static price for valuation purposes impossible.

Appendix G: Alternative options for First Nations to access, use and benefit from water in the MDB

Outside of holding mainstream water entitlements, which is the focus of this report, First Nations may access, use, and benefit from water in other ways. Table 22 summarises some examples of these alternative options across the Basin. This includes a mixture of Indigenous-specific entitlements or other arrangements, some of which are available now and others which under development. Of note, just because an alternative option is listed as "available now" does not necessarily mean that Aboriginal peoples have, to date, benefited from water in that way. Further research into experiences of trying to uptake or use these alternative options is needed.

Table 22: Examples of alternative options for First Nations to access, use, and benefit from water in the Basin

State or Territory portion of the Basin	Means of water access and/or use	Indigenous-specific	Available now	Under development	Use conditioned
Queensland	Unallocated water reserves in some surface water and aquifer systems: reserves for Aboriginal people specifically, and general reserves for 'any' applicant	√^		√	
	Aboriginal party or Torres Strait Islander parties can take or interfere with water for traditional activities of cultural purpose (*Water Act 2000* s 95)	√	√		√
NSW*	Specific-purpose Cultural Access Licences	√	√		√
	Aboriginal Environmental Water Licences (*Barwon-Darling* only)	√	√		√
ACT	WRP commitments on water entitlements	√^		√	TBD
Victoria (see O'Bryan, 2019)	Rights to take and use water for traditional purposes (*Water Act 1989* s 8A). Introduced in response to the introduction of *Traditional Owner Settlement Act 2010*)	√	√		√
	Rights to take and use water as a subset of natural resources, for traditional purposes (*Traditional Owner Settlement Act* (Vic) s 84(a))	√	√		√
Basin-wide	Native title (some States also provide for in State-based water legislation, but not all)	√	√		√
	Stock and domestic use rights (different to water entitlements) that come with being a landholder or occupier, in accordance with State and Territory water legislation		√		√
	ILSC purchasing and lending programs	√^		√	TBD
	Self-funded purchase on the open market		√		
	Co-management of environmental water (see earlier section on this)		√		√

*Other Indigenous-specific water entitlements are available in NSW but not within the MDB. See Tan and Jackson (2013).
^Program or arrangement are Indigenous-specific but the water entitlements themselves may not necessarily be.

Of note, where arrangements are Indigenous-specific, available water is often conditioned to be for "traditional" and/or "cultural" uses, and sometimes significantly so (see Jackson & Langton, 2012). In

the Queensland portion of the Basin, such use conditions were originally proposed for a portion of unallocated water (where available) that was to be strategically reserved for Aboriginal peoples. However, through consultation with First Nations, this has changed. Now, the portion of unallocated water that is to be reserved specifically for Aboriginal peoples will be issued as water entitlements that can be used for any purpose as desired and determined by the Aboriginal holders including economic, social, environmental, and/or cultural purposes (see DNRME, 2019).

LOOKING FORWARD–LOOKING BACK

Changing social and economic conditions of Aboriginal people in rural NSW, 1965–2015

Richard Howitt, Claire Colyer,
Janice Monk, David Crew and Stephanie Hull

Looking Forward – Looking Back

Changing social and economic conditions of Aboriginal people in rural NSW, 1965-2015

by Richard Howitt, Claire Colyer, Janice Monk, David Crew and Stephanie Hull

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About the statistics and terms used in this booklet

The statistical information in this booklet was collected at two key points in time – 1965 and 2011.

The information for 1965 comes from surveys collected by Janice Monk in 1965. She surveyed one in every three Aboriginal households and used information from other sources such as the NSW Aborigines Welfare Board.

The information from 2011 comes from the national Census conducted by the Australian Bureau of Statistics in 2011. This report uses information from the Basic Community Profiles and Indigenous Profiles for each location.

These two information sets were collected in very different ways and different circumstances. Both give a snapshot in time, but they are taken from different angles. Looked at together, they show trends – what has changed over time – but cannot give exact comparisons. For example, Jan's figures about employment in 1965 show the percentage of men "usually" employed, and the percentage of women who had any paid work during the year. In contrast, the Census reports how many people were actually employed on the day the census was taken. Despite such problems, these snapshots give insight into the huge changes that have taken place over the last 50 years.

Key terms

Aboriginal
The term Aboriginal is used in the text as it is generally preferred by local people involved in this project.

Indigenous
The term 'Indigenous' is used in tables where the figures come from the Australian Bureau of Statistics. It refers to people who identified in the Census as Aboriginal and/or Torres Strait Islander.

Labour Force
People aged 15 years and over who are employed or who are unemployed (but actively seeking employment) (also Workforce)

Median age
The age mid-point where half the population is younger and half is older

Median income
The income mid-point where half the population have a lower income and half have a higher income

Not in the Labour Force – 'NILF'

Not in the Labour Force means all people who are not classed as being in the labour force / workforce – this could be children, youth/students, elderly, homemakers, disabled, full-time carers and/or discouraged job seekers who are no longer looking for work.

Working age
People aged 15 years and over

Introduction

In 1965, Janice Monk, a young Australian geographer studying in the USA, visited six New South Wales country towns – Cowra, Griffith, Deniliquin, Coffs Harbour, Coraki and Fingal. Her research explored the social and economic conditions of Aboriginal households in these towns, with detailed interviews of 46 households. It contributed to Charles Rowley's large project, Aborigines in Australian Society, which influenced important national policy changes in the early 1970s.

Amazingly, Jan's original records survived in storage for nearly 50 years in the USA. They offer a detailed snapshot of Aboriginal life in rural towns across NSW. Inspired by the importance of Jan's records, and with support from the Australian Research Council, the project reported in this booklet has reconnected with families and towns involved in the original study to understand what has changed over the 50 years since Jan's survey. This booklet, *Looking Forward – Looking Back* offers a brief overview of the original study, our recent project and what it means. What has changed for Aboriginal people since 1965 in the towns Jan visited? Why and how has life changed and – in some cases – got worse for Aboriginal people in them?

The years from 1965-2015 cover nearly a quarter of Australia's post-invasion history. There have been big changes – the 1967 Referendum, citizenship rights, land rights – a shift from the assimilation policies of the 60s to self-management in the 70s, and more recent policies of 'mainstreaming'. These big policy shifts were meant to improve Aboriginal people's everyday lives. But – are things better or worse? Have changes affected people differently in different places? How can understanding the stories, statistics and impacts of these changes help people in each town to make better local futures?

We hope that this booklet will help people to look backward and forward and answer some of these questions.

The first step in revisiting this information was to return Jan's records to Australia and make them available to the families surveyed in 1965. The 'Monk Archive' has been deposited at AIATSIS in Canberra where it can be accessed by descendants of the '1965 families'. Photographs and facsimiles of the surveys have been returned to many of the families in three towns – Deniliquin, Coffs Harbour and Griffith – and will be made available to descendents of the '1965 families' from the other towns on request.

We have also been researching community experiences of change. Aboriginal groups in Deniliquin and Griffith have become actively involved, working with Macquarie University to record stories of change, develop local knowledge and build skills and understanding that will help them and their organisations shape better local futures.

Looking Forward – Looking Back summarises the research so far. It looks at Jan's original research, the Monk Archive, the towns she visited and how they have changed over 50 years. It also outlines what we learned from the research and where to go to find more information about your own town.

Richie Howitt
(Macquarie University, Sydney)

Jan Monk
(University of Arizona, Tucson)

Jan's Journey

Looking Back

Janice Monk and the 1965 research

In 1965, big changes in Aboriginal affairs were beginning. The official policy was 'assimilation' but many Aboriginal people still lived on Reserves, had limited access to welfare benefits and were not formally counted in the national Census. A campaign was under way for a national referendum in 1967 to change the Australian Constitution to allow the Commonwealth Government to make laws for Aboriginal people.

In February 1965, the Student Action for Aborigines 'Freedom Ride', led by Charles Perkins, began a journey through NSW towns to protest racial discrimination.

In March 1965, Janice Monk began her own journey to six NSW country towns, stopping for a few weeks in each place to find out about the social and economic situation of Aboriginal people in rural NSW.

Jan grew up in Sydney and won a scholarship to study at Sydney University. Later she travelled to the United States for post-graduate studies at the University of Illinois. It was from here that she decided to do her doctoral research back in Australia.

Jan chose four main towns: **Coffs Harbour, Cowra, Deniliquin and Griffith** – all about the same size (population about 5,500 – 7,500 people), with about the same proportion of Aboriginal people (about 115 – 165 people), but the history and economy of each town was different. To compare with the bigger towns, she chose two more north coast towns, **Fingal Point and Coraki**, which had much smaller populations but a higher ratio of Aboriginal people to white people.

1965 household surveys

Jan's research was based on surveys and personal interviews with Aboriginal householders.

First, she learnt what she could about each town and its Aboriginal families. Then, at random, she selected about one-third of Aboriginal households to take part in the survey, making sure to equally represent people living on reserves, in town houses, or who were camping in makeshift homes.

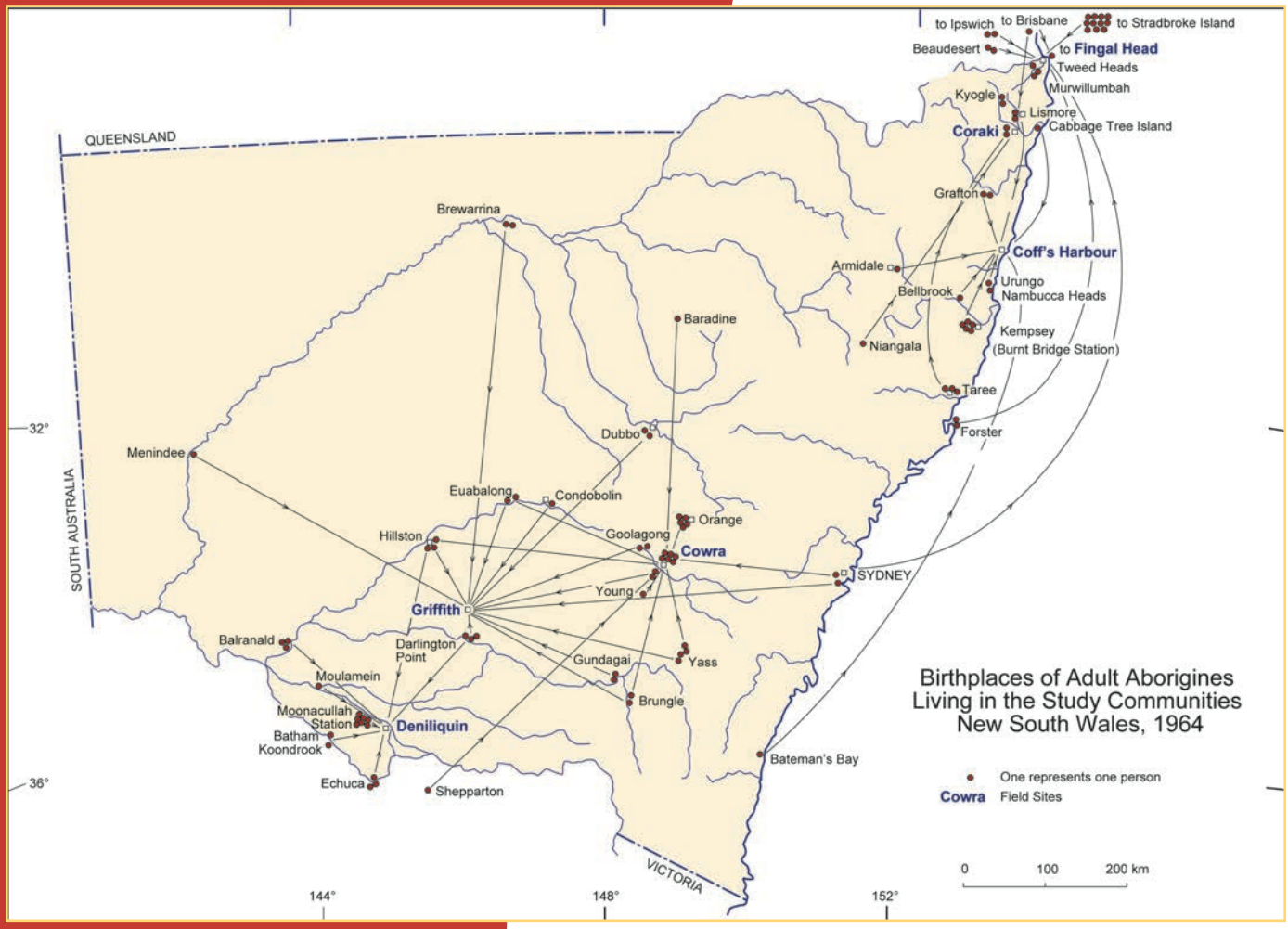
This means that only one in three of the families in each town took part in the survey.

The families who took part were invited either by a first visit at home to ask for an interview, or by meeting at social occasions that led to a home visit. The survey asked detailed questions about the home, its construction and facilities, who lived there, where they were born and had lived before, and information about work, income, health and education. A survey form was filled out for every member of the household.

Jan found that poverty was the key issue for all the Aboriginal families in the six towns. Past government policies, isolation of Aboriginal people on reserves, limited education, and prejudice continued to have a major impact on well-being, work opportunities and incomes.

Other factors were also very important, such as the local economy and availability of work in the area. In towns that were thriving, some Aboriginal families had much higher incomes than Aboriginal people in the poorer towns.

Birthplaces of Adult Aborigines living in the study communities NSW 1964



The map above shows the birthplaces of the Aboriginal people Jan interviewed, and how people moved for better opportunities.

People often travelled long distances for work, and many families also moved to towns like Griffith and Coffs Harbour for work.

Charles Rowley and the Social Science Research Council of Australia

Jan Monk's research coincided with Charles Rowley's national project for the Social Science Research Council of Australia on the social and economic well-being of Aboriginal people in Australia.

In the USA, Jan learnt of the project from a contact in Australia and wrote to Rowley. She met with the project team in Sydney and refined her research to include additional information they were looking for. In return, she received a small amount of money to support her research. Jan contributed all of her surveys and some of her research was included in *Outcasts in White Australia*, one of several books published by Rowley. The Rowley project had a big impact on policy in Indigenous affairs in Australia and was to lead to a significant new direction towards Aboriginal self-determination in the early 1970s. These changes remained influential for many decades.

The Monk Archive at AIATSIS

After completing her research, Jan returned to the USA and completed her doctoral project in 1972. She went on to a very successful career, achieving international recognition as a geographer. Jan kept the original research materials from 1965 including the detailed household surveys, photographs, and some maps and newspaper clippings. Despite house moves and life changes, the original materials remained in good condition for more than forty years, stored in this old filing cabinet in Jan's garage.

In 2013, this material was returned to Australia. The family surveys and photos are now kept at the Australian Institute of Aboriginal and Torres Strait Islander Studies (AIATSIS) in Canberra.

There are some access restrictions to protect privacy – see the back of this book to find out more about how to access the archive.

Aboriginal employment and income 1965

Aboriginal household incomes were much higher in Fingal and Deniliquin in 1965 compared with the other towns. This reflects the makeup of the Aboriginal population and the availability of work in or near these towns. Incomes were highest where there was a higher proportion of Aboriginal people in the workforce, and a higher percentage of both men and women working.

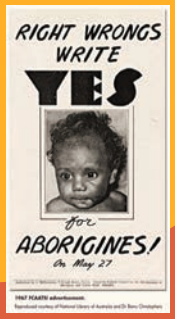
	Fingal	Deniliquin	Griffith	Coffs Harbour	Cowra	Coraki
Percent Aboriginal population in workforce	44	42	25	20	18	15
Percent Aboriginal men usually employed	91	78	69	78	45	20
Percent Aboriginal women ever employed during year	61	67	45	0	25	0
Mean household income[1] ($A/year)	3,426	3,377	2,452	1,853	2,058[2]	1,638

[1] Household income includes money from all known sources including government benefits
[2] This figure inflated by two unusual cases

1962
RIGHT TO VOTE

1965
NSW FREEDOM RIDES

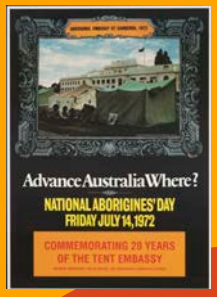
1967
REFERENDUM



1969
NSW ABORIGINES WELFARE BOARD ABOLISHED

1969 – 1983
NSW ABORIGINAL LANDS TRUST

1972
TENT EMBASSY



1974
NSW NATIONAL PARKS & WILDLIFE ACT

NATIONAL PARKS & WILDLIFE SERVICE N·S·W

1975
RACIAL DISCRIMINATION ACT

Racial Discrimination Act 1975
No. 52, 1975

1977
NSW ABORIGINAL LAND COUNCIL FORMED

1983
NSW ABORIGINAL LAND RIGHTS ACT

New South Wales Aboriginal Land Council

1987 – 1991
ROYAL COMMISSION INTO ABORIGINAL DEATHS IN CUSTODY

1989 – 2005
ATSIC

ATSIC

1960 1965 1970 1975 1980 1985

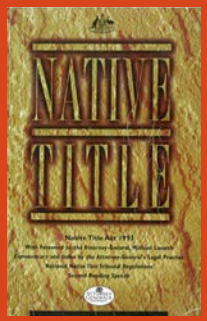
TIMELINE

1991–2000
DECADE FOR RECONCILIATION

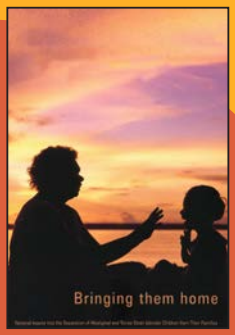
COUNCIL FOR ABORIGINAL RECONCILIATION

1992
MABO-HIGH COURT NATIVE TITLE DECISION

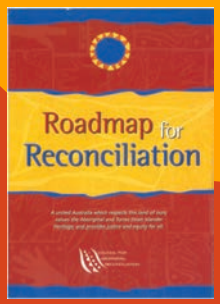
1993
NATIVE TITLE ACT



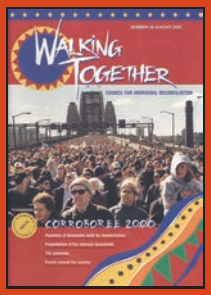
1997
BRINGING THEM HOME REPORT



2000
CORROBOREE 2000 – END OF DECADE FOR RECONCILIATION



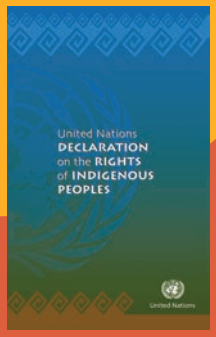
2000
BRIDGE WALKS FOR RECONCILIATION



2005
ATSIC DISBANDED

2007
NORTHERN TERRITORY INTERVENTION

2007
UN DECLARATION ON THE RIGHTS OF INDIGENOUS PEOPLES



2008
NATIONAL APOLOGY TO STOLEN GENERATIONS

2012
OCHRE ABORIGINAL POLICY NSW

2014
INDIGENOUS ADVANCEMENT STRATEGY

Indigenous Advancement Strategy

Acknowledgements

1965 SAFA Freedom Ride, courtesy of Tribune archive, State Library of NSW;

1967 Referendum leaflet, National Library of Australia;

1972 Tent Embassy 20th Anniversary Poster, National Museum of Australia,

1974 "NSW National Parks and Wildlife Service" logo, reproduced with permission of the Office of Environment and Heritage.

1977 "Land Rights Now" and 1983 NSWALC logo, NSW Aboriginal Land Council.

1990 1995 2000 2005 2010 2015

COFFS HARBOUR – then and now

Several Aboriginal families lived on banana plantations around Coffs Harbour in 1965. The small building in the centre of the photograph is an example of one of these dwellings.

1965 Surveys

Eight families took part in Janice Monk's household surveys in Coffs Harbour 1965. The heads of household were:

- Ron and Tresna **Carriage**
- Jack **Cowan**
- Tom and Mrs **Flanders**
- Mrs Evelyn **Ferguson**
- Cecil and Sylvia **Hart**
- Neil **Lynwood**
- Keith and Ann **Smith**
- Lionel **Thompson** and Iris **Thompson (Ritchie)**

Then: In 1965, Coffs Harbour was a small coastal town in a region where the major industries were dairy farming and timber, and banana plantations were an important local product. Coffs Harbour had a more diversified economy than many other north coast areas, with additional vegetable farming, tourism, fishing and port activity to support the town. Its population was just under 7,000, including about 159 Aboriginal people.

From the 1940s, Coffs Harbour had attracted many Aboriginal families in the region because it offered better work opportunities. Many families moved there from other coastal and inland towns (see map page 4). Housing was poor and limited, with only one small group of overcrowded reserve houses situated at the edge of town by the Pacific Highway. About 30% of Aboriginal households occupied these houses, another 30% were living in fringe camps on public land; a few had houses in town or on the outskirts or had small dwellings on nearby banana farms. The average household size was about eight people (the highest of any of the towns in Jan's study) and nearly 90% were multi-family households.

Now: Fifty years later, Coffs Harbour is a thriving coastal city with a complex, culturally diverse community and a booming tourist and service economy. Its active Aboriginal community has developed strong Aboriginal organisations that offer a variety of health, housing and community services, while just north of Coffs a major Aboriginal cultural centre hosts a bush tucker café, regional art gallery, and conference and accommodation facilities.

COFFS HARBOUR

Population

In 2011, Coffs Harbour was ten times bigger than in 1965. The town's Aboriginal population has grown at an even faster rate than the town, and was nearly eighteen times bigger than in 1965. Aboriginal people made up more than 4% of the population (compared with about 2% in the mid-1960s).

	COFFS HARBOUR 1965	NSW 1966	COFFS HARBOUR 2011	NSW 2011
Total population	6,996	4,248,042	68,414	6,917,659
Number of Aboriginal people	159	14,219	2,817	172,621
% Aboriginal people	2.27%	0.33%	4.12%	2.50%
Aboriginal population under 15 years	51%	48%	38%	36%

Age structure

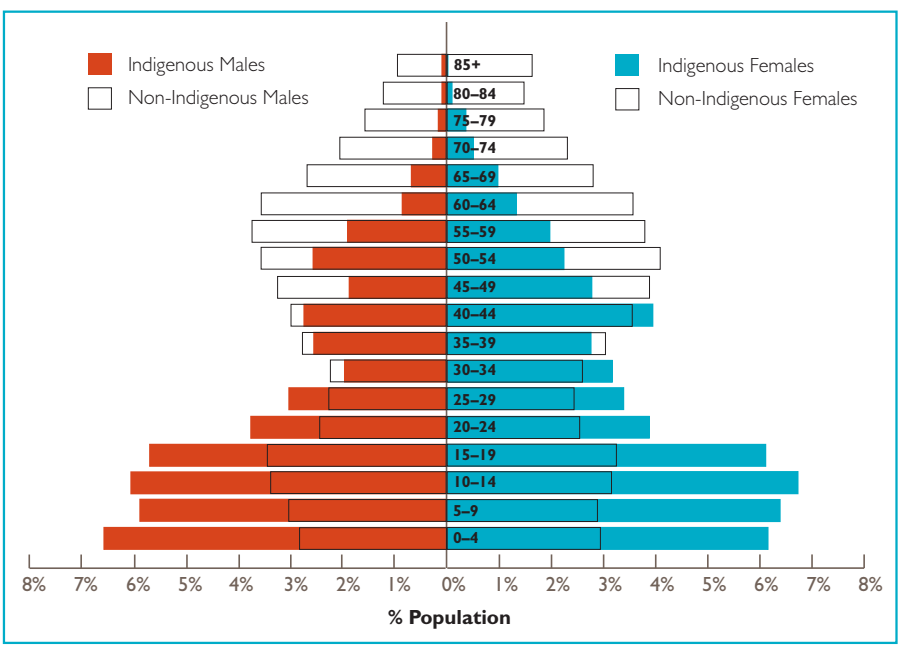
Then: Like other towns Jan visited in 1965, the Aboriginal population of Coffs Harbour was youthful, with more than half the Aboriginal people aged less than fifteen. The average age was just under 20.

Now: In 2011, Coffs Habour's Aboriginal population was still young compared with the rest of the town. The median age was 20, compared with 43 for the non-Aboriginal population. The figure for non-Aboriginal people was higher than the state as a whole because of the large number of people who retire to the region. About 38% of the Aboriginal population was under 15, and 25% was under 10. This age profile (as a wider bottom section on the 'population pyramid') indicates that there are different health, education and caring needs across different parts of Coffs Harbour's complex community.

	*Median age (years) in 2011	
	Indigenous	Non-Indigenous
Coffs Harbour	20	43
NSW	21	38

*(Median age: the age mid-point where half the population is younger, and half the population is older)

Indigenous and non-indigenous population, Coffs Harbour, 2011



Source: Australian Bureau of Statistics Census data, 2011.

COFFS HARBOUR

then

▲ Aboriginal Reserve housing
■ Camp Sites
● Other Aboriginal Dwellings

Coffs Harbour 1964

Coffs Harbour 2009

COFFS HARBOUR

Education

Then: In the 1965 survey, most people left school at the minimum age and some adults in Coffs had received very little formal education. While school-age children had better educational opportunities than their parents and grandparents, they faced challenges such as distance from school, low and insecure family incomes and direct discrimination in schools.
Jan Monk noticed an attitude of negativity and indifference in local schools in 1965, with teachers expecting little from Aboriginal children and readily accepting poor performance and low attendance.

2011	% Completed Year 12 or equivalent	
	Indigenous	Non-Indigenous
Coffs Harbour	22.9%	38.8%
NSW	23.6%	52.1%

Now: Both Aboriginal and non-Aboriginal people in Coffs Harbour tend to complete Year 12 at a lower rate than the state average. For Aboriginal students this was just under the rate for Aboriginal people in the whole state. While more non-Aboriginal people in Coffs completed Year 12, the rate of completion was well below the state average.

Income, industry and empoyment

Then: The percentage of the Aboriginal population in the workforce was 20%. Most Aboriginal men (78%) were usually employed, one of the highest rates in the six towns, but at the time the survey was taken, no Aboriginal women at all had worked at any time during the year. Men found work on local banana plantations, at the timber mill and on the railways, and generally were able to get work all year without having to leave their families. Wages were generally poor and paid at minimum rates.

Aboriginal household incomes were about $1,853 per year (equivalent to about $22,000 today). Aboriginal people surveyed in Monk's study were generally poor, but especially so in Coffs Harbour. The lack of employment for women made a great difference to Aboriginal family incomes, which were amongst the lowest of the six towns.

Now: The 2011 Census shows there has been a significant increase in incomes as the town has changed. However, **median personal incomes** for both Aboriginal and non-Aboriginal people in Coffs Harbour were lower than the state averages and the Aboriginal median personal income was about 78% of the median non-Aboriginal income. A significant proportion of the Coffs Harbour population had low incomes. About half of Aboriginal people over 15 (878 people) reported their income was below $20,800/year, while more than 40% of non-Aboriginal people (21,475 people) were in the same position.

	COFFS HARBOUR		NSW	
	Indigenous	Non-Indigenous	Indigenous	Non-Indigenous
Unemployment rate	21.7%	7.8%	16.9%	5.7%
% Men employed (15-64)	45.7%	69.5%	47.6%	75.1%
% Women employed (15-64)	42.2%	63.4%	42.6%	64.8%
Median personal income ($A/weekly)	368	473	375	566

COFFS HARBOUR

In 2011, Aboriginal unemployment in Coffs Harbour was nearly three times the rate of non-Aboriginal unemployment and was higher than the state figure for all Indigenous people.

The economy in Coffs Harbour, and Aboriginal participation in it, has changed since the 1960s.

Then: In 1965, many Aboriginal people found local employment in local agricultural industries and forestry.

Now: According to the 2011 Census, only three Aboriginal people had jobs in this sector, which employs about 1,000 people.

In 2011, Aboriginal people made up 3.1% of the workforce. About 40% of Aboriginal people aged 15-64 were 'Not in the Labour Force' because they were not available for work for various reasons, including disability and disengagement from the labour market. The flow-on effects of this situation are significant, including higher burdens of welfare dependence and caring responsibilities in the Aboriginal community.

Aboriginal people were quite well represented in Commonwealth, State and Local Government jobs, but were under-represented in private sector jobs and in most of the key industries that are the town's major employers.

Public and private sector employment in 2011

	Indigenous Male	Indigenous Female	Total Indigenous	Number of Jobs
Commonwealth Government	0.85%	2.67%	3.52%	29 of 823 jobs
State Government	1.62%	1.69%	3.30%	90 of 2,724 jobs
Local Government	2.71%	0.51%	3.21%	19 of 591 jobs
Private Sector	1.20%	1.26%	2.46%	578 of 23,542 jobs

In 2011, Coffs Harbour's biggest employers were in:

- **Health Care and Social Assistance** – Aboriginal people held 140 of a total of 4,286 available jobs or 3.27%)
- **Retail** – Aboriginal people held 78 of a total of 3,858 available jobs (or 2.02%)
- **Accommodation and Food Services** – Aboriginal people held 78 of a total of 2,799 available jobs (or 2.79%)
- **Construction** – Aboriginal people held 68 of a total of 2,659 available jobs (or 2.56%)
- **Education and Training** – Aboriginal people held 72 of a total of 2,405 available jobs (or 2.99%)

Looking forward: Coffs Harbour is a large and complex city, with a large Aboriginal population and some strong Aboriginal organisations. Of all the towns in the 1965 study, it has perhaps changed the most, dealing with very rapid growth and change in its economy. The opportunities available for Aboriginal and community enterprises and across diverse industries are significant, but so are the challenges of working in such a large and diverse community.

COWRA – then and now

Reserve housing, Erambie Mission (1965)

1965 Surveys

Ten families took part in Janice Monk's household surveys in Cowra1965. The heads of household were:

- Delma **Cain**
- Leslie and Agnes **Coe**
- Rosemary **Connors**
- Dan and Josie **Ingram**
- Ernest (Sam) and Doris **Kennedy**
- Gordon and Valerie **Simpson**
- Louisa **Simpson**
- Neville and Edna **Simpson**
- Isobel **Wedge**
- Ernest **Whitty** and Josephine **Whitty (Brown)**

Then: In 1965, Cowra was a service town in an area of moderately sized mixed wheat-sheep farms. Its population was about 6,407, including about 149 Aboriginal people.

Nearly all of the Aboriginal families at Cowra lived at Erambie Mission, which opened in 1890. In 1965, Erambie was still isolated on the other side of the Lachlan River from the main town. Visiting Erambie required an official permit. Many Wiradjuri families had long histories in the region, and many descendants of the original families still lived at Erambie, but very little work was available to Aboriginal people around Cowra, and some families migrated to other towns looking for work.

Now: Fifty years later, Cowra is a much more culturally diverse community. It is still centred in wheat-sheep country, but its economy is more diverse, with growth in tourism, wine, oil crops and services.

Cowra families have been prominent in local and national Indigenous rights movements over many decades. While many people still live at Erambie, over time a number of families have also relocated in town. Aboriginal cultural life and political activism remain strong and vibrant. Several strong community organisations in Cowra provide a range of community, land, health, cultural and early childhood education services, building strong foundations for justice in the town.

COWRA

Population – 1965 and 2011

In 2011, Cowra's population had doubled compared to 1965. The Aboriginal population was five times bigger than in 1965, with Aboriginal people making up more than 6.5% of the population compared with about 2.3% in the mid-1960s.

	COWRA 1965	NSW 1966	COWRA 2011	NSW 2011
Total population	6,407	4,248,042	12,147	6,917,659
Number of Aboriginal people	149	14,219	793	172,621
% Aboriginal people	2.33%	0.33%	6.5%	2.50%
Aboriginal population under 15yrs	54%	48%	33%	36%

Age structure

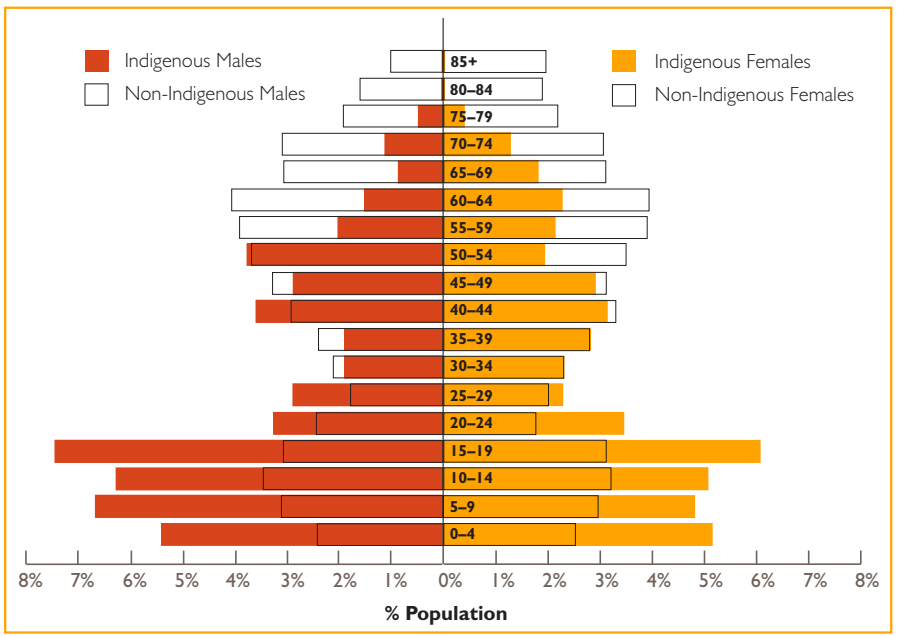
Then: In 1965, more than half the Aboriginal population in Cowra was under 15.

Now: Cowra's Aboriginal population is still very young. In 2011, the median age of Aboriginal people in Cowra was just 21, while for the town's non-Aboriginal population, the median age was 46. About one-third of Aboriginal people were under 15, about twice the proportion of under-15s for the non-Aboriginal population (17.8%). There were fewer Aboriginal people in older age groups, with no one over 80 recorded in the 2011 census. These differences, reflected in the 'population pyramid' below, mean there are different health, education and caring needs across different parts of the Cowra community.

	*Median age (years) in 2011	
	Indigenous	Non-Indigenous
COWRA	21	46
NSW	21	38

*(Median age: the age mid-point where half the population is younger, and half the population is older)

Indigenous and non-indigenous population, Cowra 2011



Source: Australian Bureau of Statistics Census data, 2011.

COWRA

then

▲ Erambie Mission
● Isolated Aboriginal Dwellings

Cowra 1964

Cowra 2010

COWRA

Education

Then: Most of the adults Jan Monk surveyed in 1965 – in all towns – left school at the minimum age. Few had had more than a primary school education, and even fewer had reached the third year of secondary education.

Now: In 2011, both Aboriginal and non-Aboriginal people in Cowra tended to complete Year 12 at a lower rate than the state average. Aboriginal students completed year 12 at about half the rate of non-Aboriginal students.

Men from Erambie lived in these pickers' quarters, near Young, while employed during the picking season. Outdoor fires were used for cooking. They earned £3 /day picking prunes from February to April, and some also picked cherries in the November–December season.

2011	% Completed Year 12 or equivalent	
	Indigenous	Non-Indigenous
COWRA	14.7%	28.4%
NSW	23.6%	52.1%

Income, industry and employment

Then: In 1965, only 18% of the Aboriginal population was in the workforce. About 45% of Aboriginal men were usually employed and 25% of Aboriginal women worked at some time during the year. These relatively low figures reflected the scarcity of jobs in the region at a time when demand for rural labour was slowing. The limited jobs available were seasonal, poorly paid and often required travelling considerable distances and long absences from home. Some families migrated to other towns like Griffith where there were better work opportunities.

Aboriginal household incomes in 1965 were about $2,058 per year (equivalent to $24,468 now).

Now: In the 2011 Census, income levels had increased. Median personal incomes for Aboriginal people were about 25% lower than for non-Aboriginal people and incomes for both Aboriginal and non-Aboriginal people in Cowra were below the state average. About half of Aboriginal people over 15 (276 people, or 52%) had incomes below $20,800 per year. A high proportion of non-Aboriginal people in Cowra – more than 4000 (nearly 46%) – also had income below $20,800 per year. This reflects the high levels of rural poverty across many areas of the state.

	COWRA		NSW	
	Indigenous	Non-Indigenous	Indigenous	Non-Indigenous
Unemployment rate	20.0%	6.0%	16.9%	5.7%
% Men employed (15-64)	35.7%	71.2%	47.6%	75.1%
% Women employed (15-64)	40.1%	60.6%	42.6%	64.8%
Median personal income ($A/weekly)	326	420	375	566

COWRA

In 2011, Aboriginal unemployment in Cowra was more than **three times** the rate of non-Aboriginal unemployment and higher than the state figure for all Indigenous people.

Cowra's economy has built on more diverse agricultural industries than in the mid-1960s, but Aboriginal participation remains limited.

Then: In 1965, Aboriginal people had few opportunities for employment in predominantly rural local industries.

Now: In 2011, Aboriginal people made up about 4.5% of the Cowra workforce. About 43% of the working age Aboriginal population was 'Not in the Labour Force' and unavailable for work for various reasons such as disability, carer roles or disengagement from the labour market. The flow-on effects of this situation are significant, including higher burdens of welfare dependence and caring responsibilities in the Aboriginal community.

Aboriginal people were well represented in Commonwealth, State and Local Government jobs and in Health Care and Social Assistance, but still had low levels of employment in some major local industries such as Agriculture. While still somewhat under-represented in retail, Aboriginal employment in this sector was at a higher level than some other major towns.

Public and private sector employment in 2011

	Indigenous Male	Indigenous Female	Total Indigenous	Number of Jobs
Commonwealth Government	0.0%	6.38%	6.38%	3 of 47 jobs
State Government	1.36%	4.32%	5.68%	25 of 440 jobs
Local Government	3.64%	2.42%	6.06%	10 of 165 jobs
Private Sector	1.92%	1.65%	3.57%	143 of 4,011 jobs

In 2011, Cowra's biggest employers were in:

- **Agriculture, Forestry and Fishing** – Aboriginal people held 10 of a total of 732 available jobs (or 1.37%)
- **Health Care and Social Assistance** – Aboriginal people held 39 of a total of 581 available jobs (or 6.71%)
- **Retail** – Aboriginal people held 19 of a total of 546 available jobs (or 3.48%)
- **Manufacturing** – Aboriginal people held 21 of a total of 486 available jobs (or 4.32%)

Looking forward: As young Aboriginal people reach working age with better education, accessing more jobs in some of the town's key industries will help increase incomes, security and participation in its growing economy. Strong Aboriginal organisations and a range of local projects focusing on improvements in health, education, rights and services are targeting increased participation and Cowra has benefitted from engaged leadership towards reconciliation across the town's culturally diverse community.

DENILIQUIN – then and now

Deniliquin town centre 1965 and 2016

1965 Surveys

Nine families took part in Janice Monk's household surveys in Deniliquin 1965. The heads of household were:

- Jack and Mrs **Atkinson**
- Harry and Mrs **Briggs**
- Mrs Clive (Gladys) **Day**
- Henry and Christine **Day**
- Tom and Mrs **Farrant**
- John C and Doris **Ross**
- Neil and Mrs **Ross**
- Oliver and Emily **Sampson**
- Lydia **Smith**

Then: In 1965, Deniliquin, on the Edward River was a prosperous town of 5,472 people with a mixed rural economy of irrigation farming, fat lamb raising, dairy production and large pastoral properties producing world class merino wool. The Aboriginal population was 114 people. Subsequently the town saw rapid growth in rice production and processing, including establishment of the southern hemisphere's largest rice mill. The area was particularly hard-hit by the Millennium Drought. The town's major employer, the rice mill, its abattoir and other businesses were forced to close.

Aboriginal people had always lived in the town or camped on the north bank of the river, but in 1961 there was a dramatic increase in the Aboriginal population. Moonacullah Mission, 40 kilometres away, was closed and families were moved overnight to new housing in Macauley Street. The move had a huge impact on the town and on the lives of all the Aboriginal families involved.

Jan Monk found that Aboriginal people in Deniliquin had better access to services, better quality housing and higher household incomes than Aboriginal people in most of the other towns in her study.

Now: By 2015, the town is recovering and businesses have reopened. There are strong Aboriginal community organisations in Deniliquin, delivering environmental, cultural, tourism and social services to the town and surrounding regions. The Edward River is now dual named with its traditional name 'Kolety'.

DENILIQUIN

Population

Deniliquin now is not much bigger than it was in 1965. Its Aboriginal population has increased much faster than the town as a whole, more than doubling since 1965. Aboriginal people now make up more than 3.6% of the population, compared with about 2% in the mid-960s.

	DENILIQUIN 1965	NSW 1966	DENILIQUIN 2011	NSW 2011
Total population	5,472	4,248,042	7,122	6,917,659
Number of Aboriginal people	114	14,219	257	172,621
% Aboriginal people	2.08%	0.33%	3.61%	2.50%
Aboriginal population under 15 years	42%	48%	36%	36%

Age structure

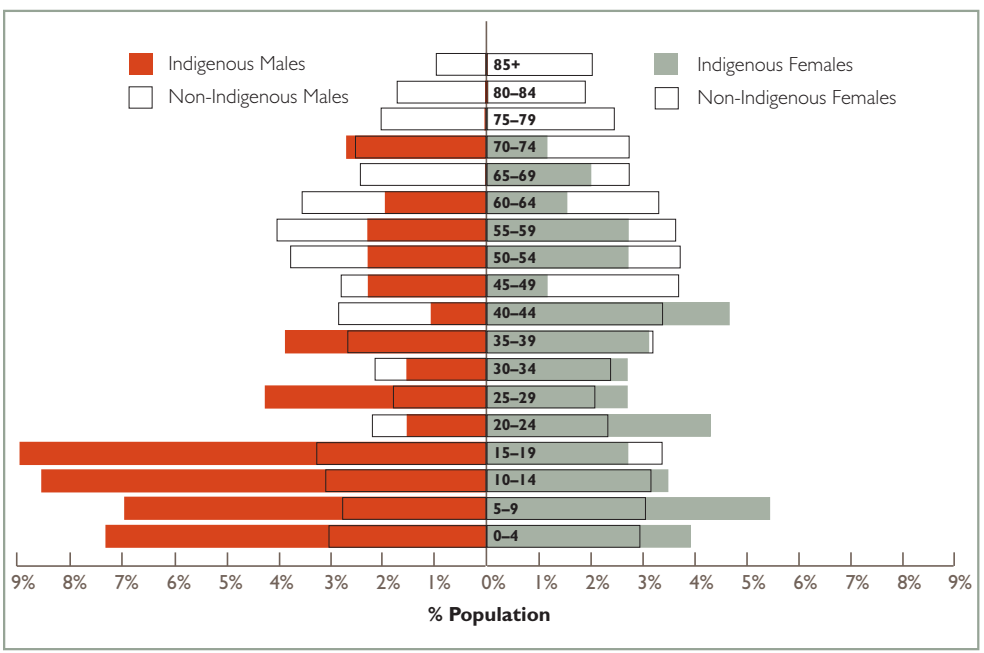
Then: In 1965, just over 40% of Aboriginal people in Deniliquin were under 15.

Now: Deniliquin's Aboriginal people are still very young compared to many places. In 2011, the median age of Aboriginal people in Deniliquin was just 18. For the town's non-Aboriginal population the median age was 45. About 36% of the Aboriginal population were under 15, roughly twice the proportion of under-15s of the whole NSW population. This difference is reflected here in the 'population pyramid' which shows a very large cohort of Aboriginal children at the bottom of the diagram.

	*Median age (years) in 2011	
	Indigenous	Non-Indigenous
Deniliquin	18	45
NSW	21	38

*(Median age: the age mid-point where half the population is younger, and half the population is older)

Indigenous and non-indigenous population, Deniliquin, 2011



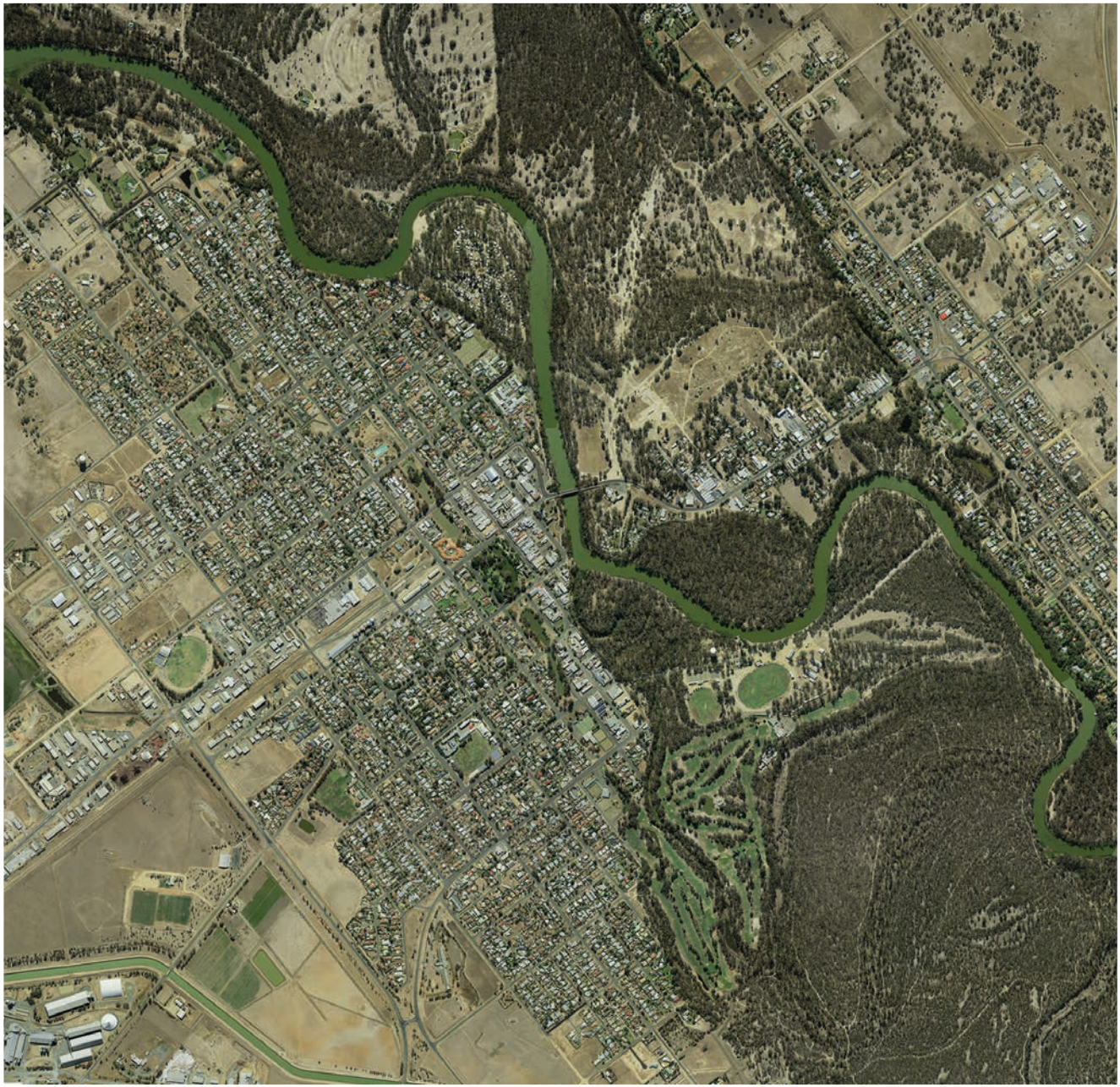
Source: Australian Bureau of Statistics Census data, 2011.

DENILIQUIN

then

▲ Aboriginal Reserve housing, Macauley Street
■ Camp Sites

Deniliquin 1961



Deniliquin 2008

DENILIQUIN

Aboriginal Welfare Board housing, Macauley Street, Deniliquin (1965)

Education

Then: Most of the adults Jan Monk surveyed in 1965 left school at the minimum age, but in Deniliquin there was a trend towards better educational outcomes than in the other towns. This was due to higher family incomes and stable employment, parental support, and the impact of some key teachers at Moonacullah and Deniliquin.

Now: In 2011, both Aboriginal and non-Aboriginal people in Deniliquin tended to complete Year 12 at a lower rate than the state average. In 2011, about 17% of Aboriginal people in Deniliquin had completed Year 12 compared with about 31% of non-Aboriginal people.

2011	% Completed Year 12 or equivalent	
	Indigenous	Non-Indigenous
DENILIQUIN	16.7%	30.9%
NSW	23.6%	52.1%

Income, industry and employment

Then: In 1965, 42% of the Aboriginal population was in the workforce – a much higher proportion than nearly all of the other towns in Jan Monk's study. Most Aboriginal men (78%) were usually employed, and a very high percentage of Aboriginal women (67%) worked at some time during the year.

Aboriginal household incomes in 1965 were about $3,377 per year (equivalent to $40,150 in 2011), higher than all of the other towns except Fingal. This was probably due to the combination of men in steady full-time jobs and the high proportion of women working.

Now: Deniliquin is no longer as prosperous as it was in 1965. Incomes for both Aboriginal and non-Aboriginal people in Deniliquin are well below the state average. In 2011 about 54% of Aboriginal people over 15 had incomes below $20,800 per year (87 people), and about 40% of non-Aboriginal people over 15 (2,154 people) were in the same position.

In 2011, Aboriginal unemployment (14.7%) was more than three times the rate of non-Aboriginal unemployment in Deniliquin, but lower than the Indigenous unemployment rate for the state as a whole.

	DENILIQUIN		NSW	
	Indigenous	Non-Indigenous	Indigenous	Non-Indigenous
Unemployment rate	14.7%	4.4%	16.9%	5.7%
% Men employed (15-64)	38.7%	75.4%	47.6%	75.1%
% Women employed (15-64)	37.0%	67.8%	42.6%	64.8%
Median personal income ($A/weekly)	333	487	375	566

DENILIQUIN

Aboriginal participation in the Deniliquin and regional economy has changed since the 1960s.

Then: Aboriginal men had traditionally worked as shearers on the stations around Moonacullah and earned award wages in the industry's unionised workforce. The rural economy was changing at this time: shearing was declining as the large pastoral properties were subdivided and irrigation supported development of rice and beef production. Closing Moonacullah in 1961 was harsh and sudden, but there were better work opportunities in town. Some men were able to get full-time jobs in town businesses and local rural work with the Water and Irrigation Commission; women found cleaning and domestic work at schools and hotels or with pastoral families who had moved into town.

Now: Aboriginal community organisations are the major employers. Most Aboriginal employment is in services, with just three jobs in the agriculture sector reported in 2011.

In 2011, Aboriginal people made up about 2.15% of the labour force. Some 41% of people in the 15-64 year age group were 'Not in the Labour Force' for reasons such as ill health, disability or disengagement from the work force. In comparison, about 23% of non-Aboriginal people aged 15-64 were 'Not in the Labour Force'. This situation has significant flow-on effects for the community, including higher burdens of welfare dependence and caring responsibilities in the Aboriginal community.

In 2011, Aboriginal people in Deniliquin were well-represented in State government jobs, but were under-represented in the private sector and none were employed in local or Commonwealth government jobs. In 2011 just 6 out of a total of 729 jobs in retailing, agriculture and transport were held by Aboriginal people.

Public and private sector employment in 2011

	Indigenous Male	Indigenous Female	Total Indigenous	Number of Jobs
Commonwealth Government	0.00%	0.00%	0.00%	0 of 23 jobs
State Government	1.32%	1.58%	2.90%	11 of 379 jobs
Local Government	0.00%	0.00%	0.00%	0 of 100 jobs
Private Sector	0.93%	0.93%	1.86%	46 of 2,476 jobs

In 2011, Deniliquin's biggest employers were in:

- Health Care and Social Assistance – Aboriginal people held 13 of a total of 442 available jobs (or 2.94 %)
- Retail – Aboriginal people held 3 of a total of 398 available jobs (or 0.75 %)
- Manufacturing – Aboriginal people held 6 of a total of 249 available jobs (or 2.41%)
- Agriculture, Forestry and Fishing – Aboriginal people held 3 of a total of 185 available jobs (or 1.62%)
- Transport, postal and warehousing – Aboriginal people held 0 of a total of 146 available jobs (or 0%)

Looking Forward: As more young Aboriginal people reach working age with better education, accessing jobs in these key industry sectors becomes more important and there will be further challenges in improving Aboriginal economic participation and wellbeing. Aboriginal community enterprises and strong community leadership that welcomes Aboriginal participation, as well as continuing improvement in education participation will be important elements for successful futures in Deniliquin.

GRIFFITH – then and now

Les Burns' camp – a family of nine people who came from Forbes for crop-picking had been living in this tent for five months (1965)

1965 Surveys

Ten families took part in Janice Monk's household surveys in Griffith 1965. The heads of household were:

- Carl and Lottie **Bamblett**
- Hector and Margaret **Bloomfield**
- Roy and Cecilia **Bloomfield**
- Les and Mrs **Burns**
- Betty **Charles**
- William and Gloria **Fields**
- John and Hazel **Firebrace**
- Cecil and Josephine **Grant**
- Arthur and Letty **Little**
- Harold and Joyce **Wymer**

Then: In 1965, Griffith was a service town for the Murrumbidgee Irrigation Area (MIA). Its population was about 7,590, including 165 Aboriginal people.

Aboriginal families were always part of the MIA's seasonal workforce, but increasingly settled in and around the town from the 1940s. Some moved to Griffith because of conflict with the reserve management in Cowra, and over time more people moved for better employment and economic opportunities. Many families are also linked to the Warangesda Mission near Darlington Point which closed in the 1920s. By the mid-1960s, housing conditions for Aboriginal families living in Griffith were generally poor. There was a small housing reserve with a pre-school and community activities at Three Ways, but more than half of the Aboriginal households in the 1965 survey were camping in shanty town conditions such as Frog's Hollow.

Now: Fifty years later, Griffith is a complex, multicultural community with a diverse agricultural, irrigation and service economy. It has strong Aboriginal organisations, and celebrates its Centenary in 2016. With more than a century of Aboriginal history to build on there is a lot happening in this unique town.

Three Ways (2014)

GRIFFITH

Population

In 2011, Griffith's population was about three times bigger than in 1965. The town's Aboriginal population has increased faster than the town as a whole and is now about six times bigger than in 1965. Aboriginal people made up more than 4% of the population (compared with about 2% in the mid-1960s).

	GRIFFITH 1965	NSW 1966	GRIFFITH 2011	NSW 2011
Total population	7,590	4,248,042	24,363	6,917,659
Number of Aboriginal people	165	14,219	1,001	172,621
% Aboriginal people	2.17%	0.33%	4.11%	2.50%
Aboriginal population under 15yrs	61%	48%	34%	36%

Age Structure

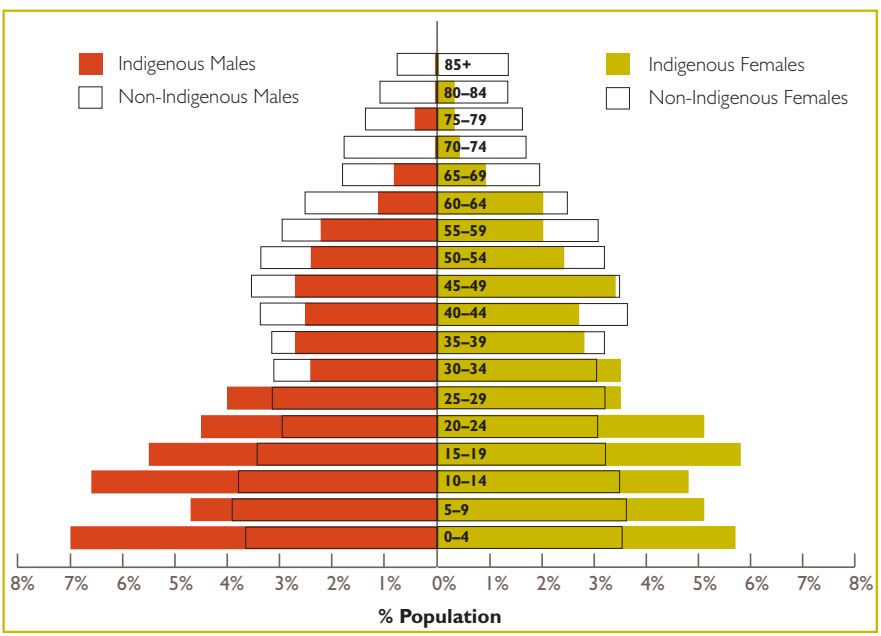
Then: Jan Monk wrote, "the Aboriginal population is youthful, with few persons over forty". In 1965, more than 61% were under 15 years, and about one-third were under five.

Now: In 2011, Griffith's Aboriginal population was still young compared with the rest of the town. Just over one-third were under 15. Sadly, far fewer Aboriginal people live into old age, with no-one over the age of 80 recorded in the 2011 Census. The median age was 21, compared with 37 for non-Aboriginal people. This age profile (reflected in the diagrams as a wider bottom section) indicates that there are different health, education and caring needs across different parts of Griffith's complex community.

	*Median age (years) in 2011	
	Indigenous	Non-Indigenous
GRIFFITH	21	37
NSW	21	38

*(Median age: the age mid-point where half the population is younger, and half the population is older)

Indigenous and non-indigenous population, Griffith 2011



Source: Australian Bureau of Statistics Census data, 2011.

GRIFFITH

then

▲ Three Ways Aboriginal Reserve
■ Isolated Aboriginal camp sites

Griffith 1965

and now

Griffith 2014

GRIFFITH

Griffith campground - several Aboriginal families lived in self-built dwellings on this land owned by the City Council (adjacent to the garbage dump) (1965)

Education

Then: In the 1965 survey, most people left school at the minimum age. While school-age children had better educational opportunities than their parents and grandparents, they faced challenges such as distance from school, low and insecure family incomes and direct discrimination in schools.

Now: both Aboriginal and non-Aboriginal people in Griffith tend to complete Year 12 at a lower rate than the state average; Aboriginal students complete year 12 at about half the rate of non-Aboriginal students.

2011	% COMPLETED YEAR 12 OR EQUIVALENT	
	Indigenous	Non-Indigenous
GRIFFITH	14.7%	34.4%
NSW	23.6%	52.1%

Income, industry and employment

Then: Most (69%) Aboriginal men had regular employment, and 45% of Aboriginal women worked at some time during the year. Most work was in unskilled areas such as labouring, seasonal crop-picking and part-time domestic work.

Aboriginal household incomes were about $2,452 per year (equivalent to $29,152 in 2011). Aboriginal people surveyed in Monk's study were poor. In comparison with Aboriginal incomes in the other towns, household incomes in Griffith were about mid-range.

Now: In the 2011 Census, while income levels had increased, Aboriginal people in Griffith were still poor. Median personal incomes for both Aboriginal and non-Aboriginal people in Griffith were lower than the state averages. Aboriginal incomes were significantly lower than for non-Aboriginal people. But there are also many poor non-Aboriginal people in the town. While half the Aboriginal people of working age reported incomes below $20,800/year (329 people) just over one-third of non-Indigenous people (6421 people) were in the same position.

	GRIFFITH*		NSW	
	Indigenous	Non-Indigenous	Indigenous	Non-Indigenous
Unemployment rate	17.9%	4.5%	16.9%	5.7%
% Men employed (15-64)	47.5%	80.2%	47.6%	75.1%
% Women employed (15-64)	40.3%	69.2%	42.6%	64.8%
Median personal income ($A/weekly)	362	539	375	566

GRIFFITH

In 2011, Aboriginal unemployment in Griffith was about **four times** the rate of non-Aboriginal unemployment and slightly higher than the state figure for all Indigenous people. Non-Aboriginal people had lower rates of unemployment.

The economy in Griffith, and Aboriginal participation in it, has changed since the 1960s.

Then: In 1965, many Aboriginal people found employment in local agricultural industries.

Now: only a handful of Aboriginal people are employed in this sector.

In 2011, Aboriginal people made up about 4% of the town's working age population, but nearly 43% of the working age Aboriginal population were 'Not in the Labour Force' because they were not available for work for various reasons, including disability and disengagement from the labour market. The flow-on effects of this situation are significant, including higher burdens of welfare dependence and caring responsibilities in the Aboriginal community.

Aboriginal people make up 2.85% of the workforce and are quite well represented in some sectors (Health Care and Social Assistance; Manufacturing) and in the Commonwealth and State Government sectors – but hold few jobs in the Local Government and private sectors, and in some industries that are the town's major employers.

Public and private sector employment in 2011

	Indigenous Male	Indigenous Female	Total Indigenous	Number of Jobs
Commonwealth Government	0.00%	3.31%	3.31%	4 of 121 jobs
State Government	0.34%	3.48%	3.82%	34 of 890 jobs
Local Government	1.62%	0.00%	1.62%	5 of 308 jobs
Private Sector	1.33%	0.95%	2.27%	221 of 9,723 jobs

In 2011, Griffith's biggest employers were in:

- **Manufacturing** – Aboriginal people held 57 of a total of 2,005 available jobs (or 2.84%)
- **Retail** – Aboriginal people held 32 of a total of 1,550 available jobs (or 2.06%)
- **Agriculture, Forestry and Fishing** – Aboriginal people held 9 of a total of 1,323 available jobs (or 0.68%)

Looking forward: As young Aboriginal people reach working age with better education, accessing jobs in the town's key industries will help increase incomes, security and participation in its strong and growing economy. Working with those employers to improve opportunities will strengthen the whole economy. Working with education providers (from pre-school to post-school activities) and employment services will benefit from engaged leadership towards reconciliation across Griffith's culturally diverse community.

CORAKI & FINGAL – then and now

▲ Box Hill Aboriginal Reserve, Coraki

1965 Surveys

Coraki

Five families took part in Janice Monk's household surveys in Coraki in 1965. The heads of household were:

- Harvey and Vita **Drew**
- Robert and Lena **Kapeen**
- Dorothy **Knight**
- Bob and Marjorie **Roberts**
- Dorothy **Skinner**

CORAKI

Then: In 1965, Coraki was a small Northern NSW town at the junction of the Wilson and Richmond Rivers. It had a population of about 905 people, including about 124 Aboriginal people.

Aboriginal families lived at Box Ridge (a Reserve on the outskirts of town created in 1907) and in housing in town. A permit was required to enter the Reserve. In 1961, the ABC Four Corners program had visited Box Ridge and highlighted the extremely poor living conditions there. When Jan Monk visited in 1965, new housing had replaced the shacks and corrugated iron huts. Jan described great social separation between Aboriginal and non-Aboriginal people, and other big challenges including severe unemployment, low incomes and poor education outcomes.

Now: Fifty years later, Coraki remains a small village but has many local businesses and services. It retains its heritage buildings and attracts some tourism. Aboriginal community organisations provide land, housing, employment and community services. Kurrachee Cooperative is a shareholder and Board member of the *Koori Mail*, a national Aboriginal newspaper.

Population – 1965 and 2011

Then: In 1965, the population of Coraki was declining. The Aboriginal population was very young, with nearly 60% under 15.

Now: Coraki has not grown much. In 2011, the population was about 50% bigger than in 1965. The Aboriginal population had grown at much the same rate, and was still very young compared with the rest of the town. The median age was 18, compared with the non-Aboriginal median age of 43.

See tables for Coroki and Fingal Head on page 36.

Education

Then: In 1965, most people left school at the minimum age and some adults in Coraki had received very little formal education. Then, prospects for school-age children were poor, with high rates of non-attendance.

Now: Both Aboriginal and non-Aboriginal people in Coraki tend to complete Year 12 at a much lower rate than the state average.

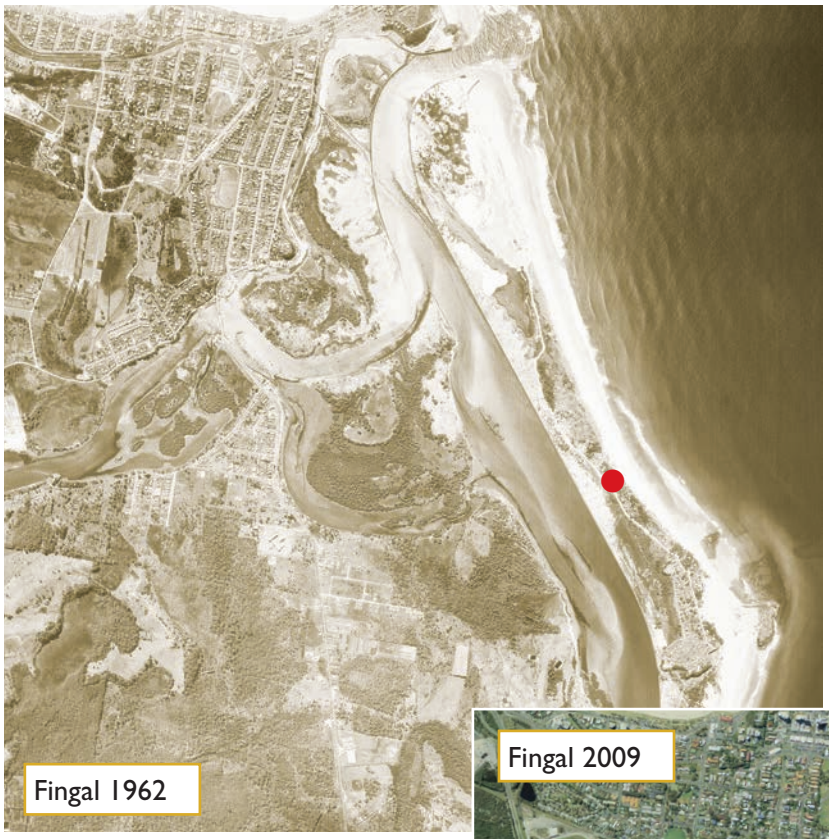
Employment and income

Then: In the 19th Century Coraki was an important river port for dairy products, but by 1965 the town was in decline and the whole area was economically depressed. Work opportunities for Aboriginal people in 1965 were very limited: only 20% of Aboriginal men were regularly employed, and none of the Aboriginal women had had any paid work that year. 15% of the Aboriginal population was in the work force. Household incomes were the lowest of the six towns at about $1,638 (about $19,475 in today's terms).

Now: Employment for both Aboriginal and non-Aboriginal people is still low compared with the state average. Incomes for both groups were also lower than the state averages.

Aboriginal home in town, Coraki (1965)

FINGAL



● Aboriginal home sites, Fingal

1965 Surveys

Fingal Head

Four families took part in Janice Monk's household surveys in Fingal in 1965. The heads of household were:

- Thomas **Corowa** and Carol **Corowa (Slockey)**
- Mrs **Fay**
- Ed **Moreton** and May **Moreton (Yetticar)**
- Bill and Joyce **Williams**

Above: Aboriginal housing at Fingal on the ocean foreshore (1965).

Below: Fingal Point in the distance from a vantage point above the Tweed River (1965).

FINGAL

Then: In 1965, Fingal was an isolated beachside village near the mouth of the Tweed River on the Far North NSW coast. It had an established Aboriginal and Pacific Islander community of 29 households in the area then known as Fingal Point.

Jan Monk reported that this community had maintained autonomy and economic independence for some decades, with little government oversight. It was the most prosperous of all the Aboriginal communities she surveyed. Residents had built their own houses to professional standards and as owner-occupiers had the freedom and mobility to move for seasonal work.

Now: The Tweed Shire has changed a lot over the last 50 years, as is evident in the aerial photos. There has been significant urban and population growth in Tweed Heads, in Kingscliff to the South and on the Gold Coast to the North. Fingal has fought to resist Gold Coast-style development and retains its unique character as a quiet village, surrounded by Aboriginal-owned and Crown land. The Aboriginal community is proactive in protecting the environment and Aboriginal heritage in partnership with a range of local community groups.

Population – 1965 and 2011

Then: In 1965, 44% of the Aboriginal population were under 15. Even so, this population was older than the other towns surveyed, and had a higher percentage of adults in the workforce.

Now: Fingal Head is now counted as a suburb. Its resident population is about 550 people in a shire of more than 24,000 people. The Aboriginal population is 67 people, and still has a much lower percentage of children under 15 than the state average.

See tables for Coroki and Fingal Head on page 36.

Education

Then: In 1965, Aboriginal people at Fingal Point had a history of better education than the other towns. Many parents had attended the local school and were active in school affairs. Their children were the majority of pupils at the school and had high attendance rates. They achieved good educational outcomes, some going on to higher education.

Now: In 2011, both Aboriginal and non-Aboriginal people in Fingal completed Year 12 at higher rates than the state averages.

Employment and income

Then: In 1965, Aboriginal people in Fingal had the highest household incomes of any of the surveyed towns. The average household income was $3,426 per annum (equivalent to $40,732 today), double the income of some other towns. Incomes were higher because of employment opportunities. 44% of the population was in the workforce. 91% of the men were usually employed, and 61% of the women had some work during the year. For men, jobs in the area were mainly on local cane farms, and some travelled as far north as Townsville for the cane-cutting season. For the rest of the year, both men and women sometimes travelled considerable distances (as far south as the Murray Valley and NSW South Coast) for seasonal crop picking.

Now: Compared to the state averages, personal incomes for Aboriginal people in Fingal in 2011 were low while incomes for non-Aboriginal people were above average. The percentage of Aboriginal men employed was higher than the state figure, but lower for women. For non-Aboriginal people it was the opposite: the percentage of men employed was lower, and for women employment was higher than the state average.

CORAKI & FINGAL

Coraki and Fingal statistics

In 1965, Jan Monk visited the small North Coast villages of Fingal and Coraki because their population and economies were quite different from the larger towns she studied.

The statistical information for the larger towns in this book was collected for the 2011 Census in the 'local government area' of each town. The Census information for Coraki and Fingal shown here was collected in a much smaller area or 'state suburb'.

Population numbers for state suburbs are much smaller than for local government areas, but this means that reporting percentage figures for employment and industry may be misleading, so we have not shown them here. For example, just one or two Aboriginal people changing jobs can produce a significant change in the percentage employed in a sector. Many people will also have jobs outside the local area, so information about the kind of jobs they have could give a wrong impression about the jobs and industries available locally. More information about these towns can be found on the Australian Bureau of Statistics website – see back page to find out more.

Population

	CORAKI 1965	CORAKI 2011	FINGAL POINT 1965	FINGAL HEAD 2011	NSW 1965	NSW 2011
Total population	905	1,479	–	546	4,248.042	6,917,659
Number of Aboriginal people	124	200	190	67	14,219	172,621
Aboriginal population under 15 years	59%	37%	44%	27%	48%	36%

*Statistical information about Coraki and Fingal Head in 2011 was collected in small areas referred to as "State Suburbs"

Age structure

	*Median age (years) in 2011	
	Indigenous	Non-Indigenous
Coraki	18	43
Fingal Head	31	44
NSW	21	38

*(Median age: the age mid-point where half the population is younger, and half the population is older))

Education, employment and income in 2011

	CORAKI		NSW		FINGAL HEAD	
	Indigenous	Non-Indigenous	Indigenous	Non-Indigenous	Indigenous	Non-Indigenous
% Completed Year 12 or equivalent	14.0%	24.9%	23.6%	52.1%	33.3%	56.9%
Unemployment rate	27.0%	10.3%	16.9%	5.7%	16.7%	7.1%
% Men employed (15-64)	17.7%	65.8%	47.6%	75.1%	62.5%	66.5%
% Women employed (15-64)	31.0%	54.9%	42.6%	64.8%	30.8%	67.2%
Median personal income ($A/weekly)	303	428	375	566	315	639

The new research

In 2005, a chance conversation between Richie Howitt (Macquarie University, Sydney) and Janice Monk (University of Arizona, USA) led them to realise that a treasure trove of information from 1965 was stored in Jan's garage. They approached the Australian Research Council (ARC) to fund a new research projectusing Jan's archive.

The project[1] was funded by the ARC in 2011. Based at Macquarie University, it aimed to consider how state and national policies have affected the well-being of Aboriginal people – for better or worse – and re-think how local initiatives and different approaches to policy making could help achieve sustainable long-term outcomes in the future.

There were two main elements – to return the Monk Archive to Australia for community and research use, and to work with families and communities in towns Jan visited to understand what has changed for Aboriginal people during the big policy upheavals of the last 50 years. This meant gathering

- stories from the community about their experiences since 1965
- information from policy archives
- statistical information from ABS Census data in 2001, 2006 and 2011

The project concentrated on the four main towns in Jan's original study: Coffs Harbour, Cowra, Deniliquin and Griffith.

In Coffs Harbour and Cowra, the focus was mainly on bringing back the archival material. In Deniliquin and Griffith community members also became involved in new research, forming local steering groups to work with the Macqurie University team and developing strong cultural protocols to guide research activities; local researchers worked with local education providers to develop interviewing skills.

About 80 interviews were recorded with Aboriginal community members and with representatives of agencies and service providers in the wider community. Local researchers and the Macquarie team have worked together to build up a picture of how the lives of Aboriginal people have changed over time and the key challenges for communities now and in the future.

The ARC-funded research was completed in early 2016, but Macquarie University would welcome further collaboration in the future with community organisations in the towns involved in Jan's 1965 research (see contact information at the end of this booklet).

Coffs Harbour community consultation with descendants of the '1965 families' (May 2014)

Clockwise L-R: Emily Hindman, Claire Colyer, Deb Dootson, Barry Hoskins, David Crew, Angela Cowan, Kim Le-Broch, Tony Hart

[1] *Social conditions of Aboriginal people in rural NSW: rethinking policy failure and future options* Australian Research Council DP110101721.

Deniliquin

When Richie Howitt first visited Deniliquin in 2011, Yarkuwa was already working to build community strengths and had set up its own archive recognising local family histories. Seeing how the project fitted with its own aims, Yarkuwa agreed to become the research partner.

Jan Monk and Richie Howitt at Yarkuwa Indigenous Knowledge Centre in 2014. Part of the Yarkuwa Family History gallery is visible on the back wall.

A project reference group guided the project and Yarkuwa's progam manager, David Crew, took on doctoral studies for the project at Macquarie University in 2012. A strong cultural protocol was approved as part of the university's ethics approval process.

The project built skills in Yarkuwa's members: local trainees worked with Deniliquin TAFE to learn interviewing skills, and many local community interviews were done by young Aboriginal people who were hearing and thinking about the changes in their families and community in a very different way than ever before.

Researchers Tracy Hamilton and Carren Bux record an interview at Yarkuwa Indigenous Knowledge Centre (2015)

The research found very varied responses. Older people in their 60s and 70s reflected that the 1960s was a much better time, when people had less need for money and a stronger sense of community. But people growing up in the 1970s and 80s talked about it being much better now: greater access to opportunity, more mobility, and many more choices.

> *"People were very willing to tell their story, and very willing to be very honest about how they perceive what's happened to them in their lives. The government agencies, industry leaders and other stakeholders that were interviewed were also very honest in how they saw their role in trying to deliver government policy into the local community."*
>
> **David Crew,**
> **Yarkuwa Indigenous Knowledge Centre.**

Yarkuwa has taken the research into the Aboriginal community and brought community leaders from local government, business, and government agencies together with the community to discuss what is being learned. The project provided valuable information that has helped Aboriginal and non-Aboriginal community leaders work together more effectively in a new conversation that increasingly aims to ensure the whole community is included in thinking about better futures for the town.

> *"Really good things will come out of the research, but another good thing is that we now have numerous people in our community trained in doing interviews and recording, and we're talking about how are we going to make it good for our community, to have oral histories stored in a safe place."*
>
> **Jeanette Crew, Chairperson,**
> **Yarkuwa Indigenous Knowledge Cente**

Griffith

The project in Griffith was slow to start, but quickly gained momentum when the Yamandhu Marang Griffith Social Research Reference Group formed in 2014.

The Reference Group members – Stephen Collins, Bev Johnson, Lynette Kilby and Roger Penrith – brought a wealth of experience and community networks through their roles in key organisations and community-based work in Griffith.

Like the Yarkuwa project in Deniliquin, the Yamandhu Marang group started out with a strong cultural research protocol incorporated into the Macquarie University ethics approval, and also opted for local training to develop research skills in the community. The project was hosted at Dyirri-Bang-Gu, a local community organisation, and Candy Kilby was appointed as local project coordinator.

The project picked up pace in early 2015. In March, a group of young Aboriginal women started training in interviewing and research skills at Western Riverina Community College and began recording interviews with Aboriginal people and leaders in the community. The Macquarie research team was asked to follow up with interviews of non-Aboriginal community leaders and service providers. This mix of interviewees gave valuable insight into the wide range of perspectives on the issues and challenges for the town.

> *“I have really enjoyed being involved with this reference group, that will hopefully lead to policy reform and lead change for better social conditions for Aboriginal people in Griffith.”*
>
> **Roger Penrith,**
> **Yamandhu Marang Reference Group**

There was a very positive reception for the Monk Archive at the Griffith Family History Day in May 2014. Jan Monk met up with people from the families she had interviewed in 1965.

L-R: Jan Monk, Gloria Goolagong, Bev Johnson, and Melissa Carberry (who took part in the research skills training)

In November 2015, members of the Yarkuwa team from Deniliquin, the Griffith Yamandhu Marang reference group and the Macquarie research team came together in Griffith for a two-day workshop to compare notes about what their projects found in each town and to brainstorm ideas about how to make best use of the research findings. One decision was to produce this booklet and include information for all six towns in Jan Monk’s original research so that all the towns would benefit.

The Reference Group and Macquarie University are exploring ways to expand the research in the future to support the efforts of the Aboriginal community organisations and other agencies to improve community futures in Griffith.

Collaborative Research Workshop – Canberra, 2015

In June 2015, Aboriginal community members involved in the project in Coffs Harbour, Deniliquin and Griffith joined university researchers in a workshop in Canberra to discuss ways of working in collaborative projects between communities and universities. The 'Giving Back Workshop' at AIATSIS was organised by the Indigenous Peoples Knowledges and Rights group of the Institute of Australian Geographers and included projects happening in rural NSW, regional Western Australia, north-east Arnhem Land, and across the Western Australia-Northern Territory border. Community reports from our project were delivered by both local and university researchers.

Research collaboration is complex and challenging. The workshop concluded that if research is to be of lasting value for both communities and researchers it needs to respect local values, foster trust and be respectful of cultural protocols and insights. The workshop highlighted the important role of young community-based researchers in creating mutually beneficial partnerships and outcomes.

> *"The young community researchers were really confident, and you could see how much they enjoyed working on the project. It was wonderful to see them being empowered."*
>
> Roger Penrith,
> Yamandhu Marang Reference Group

Key project findings

Our project aimed to listen to local Aboriginal people telling their own stories so we can understand the difficulty of framing policies that support sustainable local well-being.

Rural poverty matters

In 1965, Aboriginal people in these towns had low incomes and were economically disadvantaged. Fifty years later, the economic circumstances of Aboriginal people in rural NSW have not changed very much. There is no simple, single story about economic disadvantage and rural poverty in NSW. The picture is uneven in just these four towns:

- **Coffs Harbour** is overall a wealthier town now than in 1965, but Aboriginal people are now relatively worse off compared with non-Aboriginal people.
- **Cowra** was, and still is an economically disadvantaged town. Of the four towns, the difference between Aboriginal and non-Aboriginal incomes is the smallest, and median incomes for both groups are well below state averages.
- **Deniliquin** is much worse off economically than in 1965 and incomes for both Aboriginal and non-Aboriginal people are well below the state averages. Aboriginal people hold few jobs with the town's major businesses, while small Aboriginal community organisations like Yarkuwa and the Deniliquin Local Aboriginal Land Council have become the town's major Aboriginal employers.
- **Griffith's** diversified agricultural economy has produced great wealth in the town since 1965, but also the greatest difference between Aboriginal and non-Aboriginal incomes.

Rural poverty and Aboriginal poverty must be addressed together. State and Commonwealth policies that aimed to change Aboriginal poverty have clearly not succeeded, but this is not only an Aboriginal issue – there is significant economic disadvantage across whole rural communities.

Local economies matter

Locally tailored solutions are needed, not the 'one size fits all' approaches preferred by governments. Low incomes and local disparities in wealth and opportunity reflect the local economy and particular history of each town.

Long-term disadvantage matters

Local histories of educational disadvantage, institutional and direct racism, poor health and unemployment reinforce ongoing disadvantage.

The legacy of poor health, education and well-being shown in statistics is reflected in the high levels of people in each town who are unemployed or not in the labour force.

The Aboriginal population is young

Aboriginal communities in these towns are very young. In most towns, the median age of the Aboriginal population is in the late-teens or early-twenties, compared to late-30s to mid-40s for the non-Aboriginal population. This means that the responsibility of supporting and caring for a large, young population falls on a small group of able adults.

These towns face a double challenge in fostering success for large youthful populations while dealing with ageing populations. Positive education outcomes, improved training and local employment will be central to successful futures in each town.

Are things better now than fifty years ago?

There are different stories from each decade since the 1960s.

The past 50 years covers nearly a quarter of Australia's post-invasion history, and there have been big changes. Action by Aboriginal groups and changes in some government policies (such as recognising Aboriginal rights to pensions and other citizenship rights, land rights, targeted education programs, Aboriginal participation in environmental programs) have improved a lot of things.

"All the big policy decisions and planning is based on research and statistics and now we can take that to a negotiating table and say, 'This is our proof. This is what the research is telling us' – and that's something we've never had before..."

Jeanette Crew,
Chairperson, Yarkuwa Indigenous Knowledge Centre

What have we learned?

Failure to address the needs of Aboriginal people in rural towns is a national concern.

Long-term disadvantage, failed policies and unsuccessful programs have consequences for individuals, families and communities. Many rural towns striving for strong futures also face overlapping crises. Meeting these challenges calls for local collaboration, policies that respond to local needs and tailored solutions that have national support. Including Aboriginal people is an essential foundation for successful rural futures.

Each town has its own stories of change in employment, population and wealth. Numbers tell important stories, but can't reveal the truth about particular places and their families. A lot of policy thinking looks at numbers across the whole state or the whole nation. Making sure policies are effective locally is often overlooked.

This collaborative project with Yarkuwa Indigenous Knowledge Centre in Deniliquin and the Yamandhu Marang Griffith Social Research Reference Group shows that local successes do improve the health and well-being of Aboriginal people, and the social and economic fabric of communities. In Deniliquin, Yarkuwa's approach to Asset-Based Community Development focuses on what is possible. In Griffith, the Aboriginal Medical Service has established programs that improve health services for the whole community.

In all towns, leadership from local government, industry and community organisations to increase participation of Aboriginal people, the unemployed and under-employed people in all industries is urgently needed.

What's next?

Sustainable futures build from the bottom-up.

Our research identifies failures in service delivery and accountability that undermine local efforts to build productive, sustainable and inclusive economies and communities.

More of the same is not enough.

Public policy can improve outcomes for rural Aboriginal communities if there is support for local initiatives, instead of continuing with 'top-down' policies that have failed in the past.

Sustainable futures for rural Aboriginal groups is good for rural Australia.

Rural towns need to move beyond race-based approaches to change and build new approaches to leadership and service. There needs to be combined effort from local government, private industry, state and Commonwealth agencies, schools, colleges and universities, media and Aboriginal groups.

Where to go for more information

The Monk Archive at AIATSIS

The original 1965 family surveys and photographs were donated to AIATSIS in Canberra in 2013. A 'finding aid' to the household records is available at **http://aiatsis.gov.au/research/guides-and-resources/collection-finding-aids** (search for MS 5068, Janice Monk).

To protect the privacy of the people who took part in the survey, access to the completed forms is only available to people authorised by the AIATSIS Chief Executive Officer, on condition that no individual will be identified in published works without appropriate permission.

Family members who wish to access the survey material should contact AIATSIS Collections staff at **collectionenquiry@aiatsis.gov.au** or telephone (02) 6246 1182.

Photographs: are available to the public and can be viewed in person by visiting AIATSIS in Canberra, but they are not yet available to view online. Copies of the photographs can be ordered from AIATSIS and a list of the photograph captions will be available online from mid-2016.

Email: collectionenquiry@aiatsis.gov.au.
Write: GPO Box 553, Canberra ACT 2601
Visit: 51 Lawson Crescent, Acton ACT 2601
Website: http://aiatsis.gov.au

Statistical information

The 2011 statistical information in this booklet came from the national Census taken by the Australian Bureau of Statistics **(http://www.abs.gov.au)**. The Census is held every five years.

Statistical information about your town and community is available online, using ABS QuickStats: http://www.abs.gov.au/websitedbs/censushome.nsf/home/quickstats

Search for 'QuickStats' on the ABS home page, or type in the QuickStats web address above. Then:

- enter the location you are looking for in the QuickStats search box,
- select from the dropdown menu
- click 'GO'.

A map of the location and general information about the place and population will appear. To see more detailed statistical spreadsheets, click the 'Community Profile' box above the map.

Hint: to view information shown in this booklet about Cowra, Griffith, Deniliquin and Coffs Harbour, select "Local Government Area (LGA)" from the dropdown menu. For Fingal Head and Coraki, select "State Suburb (SSC)".

The Looking Forward – Looking Back project

For general information about the project, contact:

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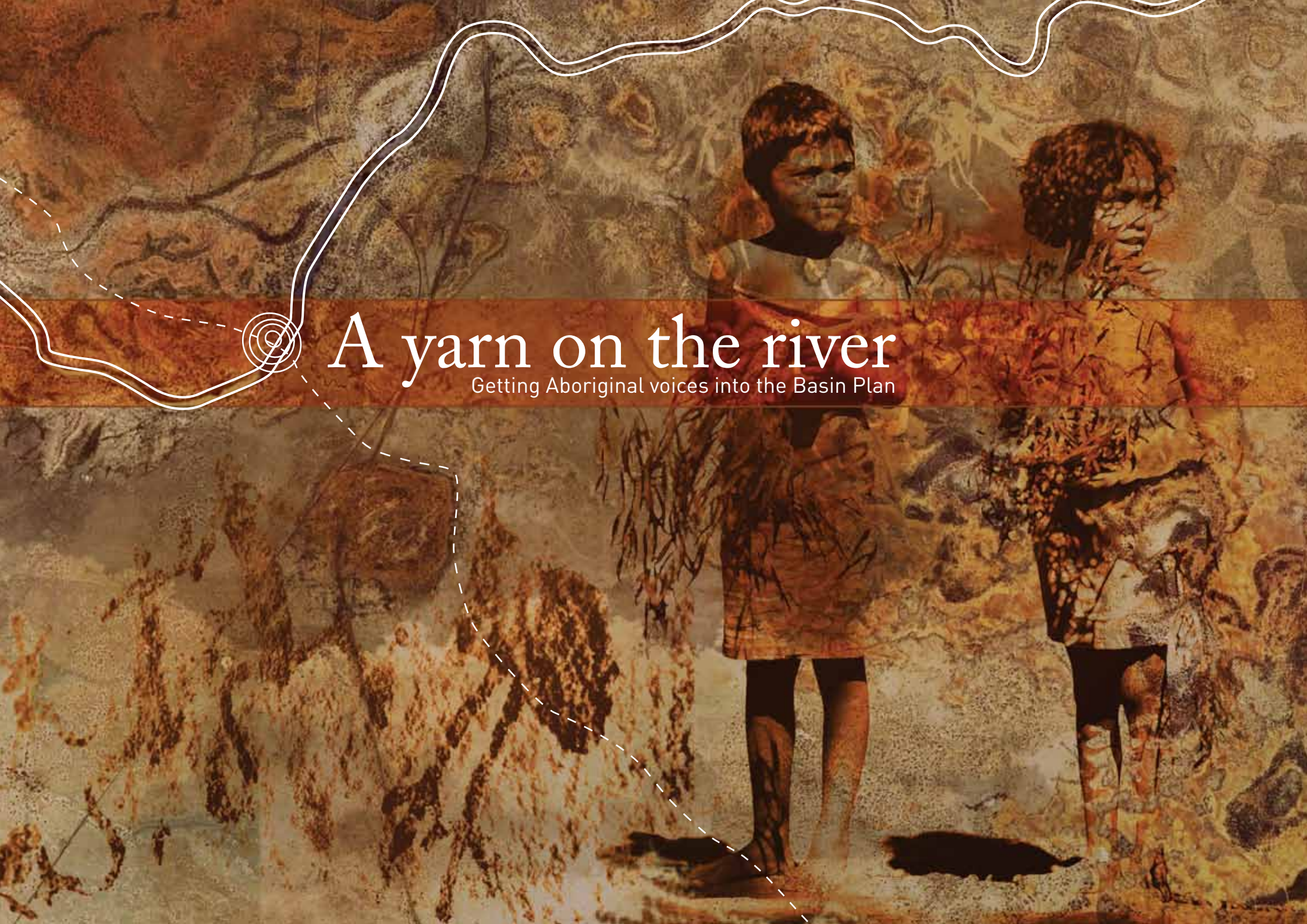
In 1965, Janice Monk, a young Australian geographer studying in the USA, visited six New South Wales country towns – Cowra, Griffith, Deniliquin, Coffs Harbour, Coraki and Fingal. Her research explored the social and economic conditions of Aboriginal households in these towns.

Nearly fifty years later, with Macquarie University geographer Richie Howitt and Aboriginal colleagues from Deniliquin, Griffith and Coffs Harbour, and support from the Australian Research Council, that data has been returned and reconsidered in the light of fifty years of policy efforts to deliver sustainable benefits to Aboriginal people in rural towns in NSW. This booklet reports key results for the communities and gives information on how to follow-up interest in the project and the Monk Archive.



A yarn on the river

Getting Aboriginal voices into the Basin Plan

Our people say that the water is the blood flow of Mother Earth. Like loss of blood causing problems for the human body, our culture suffers in the same way without water.

Euahlayi man Michael Anderson is sitting by his beloved Bokhara River in north-west NSW. Cultural flows will nurture the growth of native mud crabs and Water-rats whose health has always been important to Aboriginal people.

This type of rush here — this is what our old people used to go out and collect.

We're now finding them very hard to get.

Ngarrindjeri woman Ellen Trevorrow makes baskets out of rushes near Camp Coorong on the River Murray in South Australia. Cultural flows will allow the rushes to grow.

‘To bring it into the 21st century and to put it as two words: cultural flows. I guess all we’re saying is that what’s needed is for there to be enough water coming through all of our story places — through waterways and wetlands — to enable us to continue our ceremonial business. It is very important to us.’

Kooma (Gwamu) woman Cheryl Buchanan is from Nebine River country in south-west Queensland. The grinding grooves along the Nebine are important to the Aboriginal people who have lived along the river for centuries.

Acknowledgement of the Traditional Owners of the Murray–Darling Basin

The Murray–Darling Basin Authority acknowledges and pays respect to the Traditional Owners and their Nations of the Murray–Darling Basin. The contributions of earlier generations, including the Elders, who have fought for their rights in natural resource management are also valued and respected.

The Authority recognises and acknowledges that the Traditional Owners and their Nations in the Murray–Darling Basin have a deep cultural, social, environmental, spiritual and economic connection to their lands and waters. The Authority understands the need for recognition of Traditional Owner knowledge and cultural values in natural resource management associated with the Basin. Further research is required to assist in understanding and providing for cultural flows. The Authority supports the belief of the Northern Murray–Darling Basin Aboriginal Nations and the Murray Lower Darling Rivers Indigenous Nations that cultural flows will provide beneficial outcomes for Traditional Owners.

The approach of Traditional Owners to caring for the natural landscape, including water, can be expressed in the words of Ngarrindjeri Elder Tom Trevorrow: 'our traditional management plan was: don't be greedy, don't take any more than you need and respect everything around you. That's the management plan — it's such a simple management plan, but so hard for people to carry out.'*

This traditional philosophy is widely held by Traditional Owners and respected and supported by the Murray–Darling Basin Authority.

**Tom Trevorrow (2010) Murrundi Ruwe Pangari Ringbalin 'River Country Spirit Ceremony: Aboriginal Perspectives on River Country'*

About the Murray–Darling Basin Authority

The Murray–Darling Basin Authority (MDBA) is an independent Authority that has been set up under the *Water Act (2007)* to write the Basin Plan. The MDBA also oversees the running of the River Murray, and coordinates native fish management and salinity management in the Basin.

The Basin state governments will put the Basin Plan into action. They will write water resource plans that follow the rules in the Basin Plan.

The partnerships between the MDBA, the Basin states and the people and communities throughout the Basin is very important.

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Ramsar (Iran) (1971) *Convention on Wetlands of International Importance especially as Waterfowl Habitat* (amended: Paris Protocol on 3 December 1982 and Regina Amendments on 28 May 1987)

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Outcomes of:

- Indigenous Basin–wide Gathering Canberra, ACT — May 2004
- NBAN Full Delegation Gathering Roma, Queensland — April 2010
- MLDRIN Full Delegation Gathering Canberra, ACT — May 2010
- NBAN Executive Committee meeting Tamworth, NSW — February 2011
- MLDRIN Executive Committee meeting Albury, NSW — March 2011
- Joint NBAN–MLDRIN Gathering Canberra, ACT — June 2011

Acronyms/abbreviations used in this document

Organisations

MDBA	Murray–Darling Basin Authority
MLDRIN	Murray Lower Darling Rivers Indigenous Nations
NBAN	Northern Murray–Darling Basin Aboriginal Nations
NCFPRC	National Cultural Flows Planning and Research Committee
NSWALC	New South Wales Aboriginal Land Council
QMDC	Queensland Murray–Darling Committee
SWNRM	South West Natural Resource Management

Other

CHWN	Critical Human Water Needs
EWP	Environmental Watering Plan
GL	Gigalitre (1 billion litres)
NWI	National Water Initiative
SDL	Sustainable Diversion Limit
WRP	Water Resource Plans

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This booklet may contain images or quotes from Indigenous people who have passed away. Appropriate permissions have been provided by the families of deceased people.

Welcome to A yarn on the river

A Yarn on the River has been created to help you understand the draft Basin Plan and to assist you to have your say about what's in the final Basin Plan. **This booklet highlights the parts of the draft Basin Plan most relevant to Aboriginal people.**

The draft Basin Plan is a plan for the sustainable management of the water resources of the Murray–Darling Basin. It has been prepared by the Murray–Darling Basin Authority (MDBA) — a Commonwealth government agency responsible for the high level planning for the Murray–Darling Basin — together with Queensland, New South Wales, Victoria, South Australia and the Australian Capital Territory.

From January to mid–April 2012 we would like you to tell us your views on the draft Basin Plan and how it can be improved to better address your concerns. Once this public consultation period has finished — in April 2012 — your views will be considered for inclusion in the final Basin Plan.

The Murray–Darling Basin Authority is talking with Indigenous communities

The Murray–Darling Basin Authority will be travelling to towns throughout the Basin to talk with Aboriginal people on their country. We want to meet wherever you feel comfortable — in halls, in homes, or by the river with a cup of tea. This is part of the MDBA 20-week consultation period on the draft Basin Plan.

While visiting your country, we hope to help you learn more about the draft Basin Plan, and have your say about what's in the final Basin Plan.

Submissions will close on 16 April 2012.

We're visiting regional areas

The Murray–Darling Basin Authority is aiming to visit 22 towns during the 20-week consultation period to talk with Indigenous communities. Towns and dates can be found on the MDBA website or by calling 1800 230 067.

Part 1

MDBA Chair, Craig Knowles

The Authority recognises the deep, intimate, ancient and living relationship Indigenous people have with their lands and waters. We're keen to continue working with Indigenous groups and people to ensure their interests in the Basin are recognised and protected. I encourage everyone to share their knowledge, experiences and views with us as we develop the Basin Plan.

MLDRIN Chair and Ngarrindjeri man, Grant Rigney

The Murray Lower Darling Rivers Indigenous Nations (MLDRIN) represents 21 Indigenous Nations in the south of the Basin. MLDRIN — in partnership with NBAN — has been providing Indigenous perspectives on natural resource management and cultural issues in the Basin for many years. Now with the release of the draft Basin Plan it is a crucial time for Indigenous Nations and Traditional Owner groups all over the Basin to have your say on how you want our rivers to be managed.

NBAN Chair and Murrawarri man, Fred Hooper

The Northern Murray–Darling Basin Aboriginal Nations (NBAN) represents 22 Aboriginal Nations in the north of the Basin. Cultural flows is a significant issue for Aboriginal people in the Basin. As the Murray–Darling Basin Authority — together with NBAN and MLDRIN — visit towns all over the Basin, it is an important time for you to have your say on the draft Basin Plan and make a difference. I encourage the *Yarn on the River* to be distributed to Aboriginal Nations within and beyond NBAN and MLDRIN.

What is the draft Basin Plan?

The draft Basin Plan (legally called the *proposed Basin Plan*) is the first version of the Basin Plan that the MDBA is putting out for your comments and feedback.

We are asking you to have a say on the draft Basin Plan over the next few months. The MDBA is accepting comments and submissions until 16 April 2012.

The parts of the draft Basin Plan most relevant to Aboriginal people are detailed on page 16 of this document.

To find out more about the draft Basin Plan, visit our website: www.mdba.gov.au

What is the Basin Plan?

After considering comments from the communities of the Basin, the current draft will be refined and become the Basin Plan.

The Basin Plan is a high-level plan for how water in the Basin will be managed into the future. It will help to ensure that water resources in the Murray–Darling Basin are managed in an integrated and sustainable way.

It is important to note that the Basin Plan will adopt two key principles — the need for adaptive management and the need for localism — to allow for changes over time (see page 14)

The Basin states will put the Basin Plan into action. They will write water resource plans that follow the rules in the Basin Plan (see page 19)

The Basin Plan is expected to be passed into law in 2012. The water resource plans will be adopted in 2019.

The Basin Plan will be reviewed (and changed if necessary) in 2015, 2022 and every 10 years after that.

Why should Aboriginal people have a say on the draft Basin Plan?

The Basin Plan will have an impact on how river country is managed in the Murray–Darling Basin.

Aboriginal people should have a say about this, because, as Paakantyi woman Trish Johnson says, 'Water is our life.' The rivers sustain the life and identity of Aboriginal people in the Basin.

It is important that Aboriginal people have a strong voice in how government makes decisions about the rivers and wetlands.

You can have your say in person at the meetings we will hold around the Basin. Otherwise, you can send your comments via mail or online.

Details on how to make a submission are on page 29 of this booklet.

The draft Basin Plan will be refined and finalised as the Basin Plan, and passed into law in 2012.

Part 2

Aboriginal voices in the Basin

MLDRIN and NBAN joint gathering, Canberra, 13-14 December 2011.

The MDBA works closely with two self–determining independent Traditional Owner organisations: the Murray Lower Darling Rivers Indigenous Nations (MLDRIN) and the Northern Murray–Darling Basin Aboriginal Nations (NBAN).

MLDRIN and NBAN have helped provide an Aboriginal perspective on natural resource management and cultural issues for the Basin Plan.

NBAN and MLDRIN share a common aim to seek greater recognition and respect for Aboriginal knowledge and values regarding land and water management.

Over the past year, both MLDRIN and NBAN have met regularly with the MDBA to discuss the Basin Plan.

Murray Lower Darling Rivers Indigenous Nations (MLDRIN)

MLDRIN was formed in 1998 and is a confederation of 21 Indigenous Nations from the southern part of the Murray–Darling Basin.

MLDRIN comprises Traditional Owner representatives from the following Nations:

Barapa Barapa, Dhudhuroa, Dja Dja Wurrung, Latji Latji, Maraura, Mutti Mutti, Nari Nari, Ngarrindjeri, Ngintait, Nyeri Nyeri, Tati Tati, Taungurung, Wadi Wadi, Wamba Wamba, Waywurru, Wergaia, Wiradjuri, Wotjobaluk, Yaitmathang, Yita Yita, Yorta Yorta.

MLDRIN continues to have a significant role in The Living Murray program.

www.mldrin.org.au

Northern Murray–Darling Basin Aboriginal Nations (NBAN)

NBAN was formed in April 2010 and comprises 22 Aboriginal Nation representatives from the northern part of the Basin and representatives from the NSW Aboriginal Land Council (NSWALC), South West Natural Resource Management in Queensland, the Queensland Murray–Darling Committee (QMDC) and The Condamine Alliance.

NBAN comprises Traditional Owner representatives from the following Nations:

Barkindji (Paakantyi), Barunggam, Bidjara, Bigambul, Budjiti, Euahlayi, Gamillaroi, Githabul, Gunggari, Gwamu (Kooma), Jarowair, Kambuwal, Kwiambul, Kunja, Maljangapa, Mandandanji, Mardigan, Murrawarri, Ngemba, Ngiyampaa, Wailwan, Wakka Wakka.

www.nban.org.au

What Aboriginal people have said about water so far

Over the past decade, Aboriginal people have expressed their values and interests in the lands and waters of the Murray–Darling Basin (see references on page v). The following is a summary of views expressed in a number of reports as well as NBAN and MLDRIN workshops and gatherings:

Aboriginal people seek recognition of their **cultural, social, environmental, spiritual and economic connection** to the lands and waters of the Murray–Darling Basin. They want **recognition** and **respect** for their traditional knowledge, ongoing cultural practices and **customary sovereign rights** as Aboriginal Nations of the Basin.

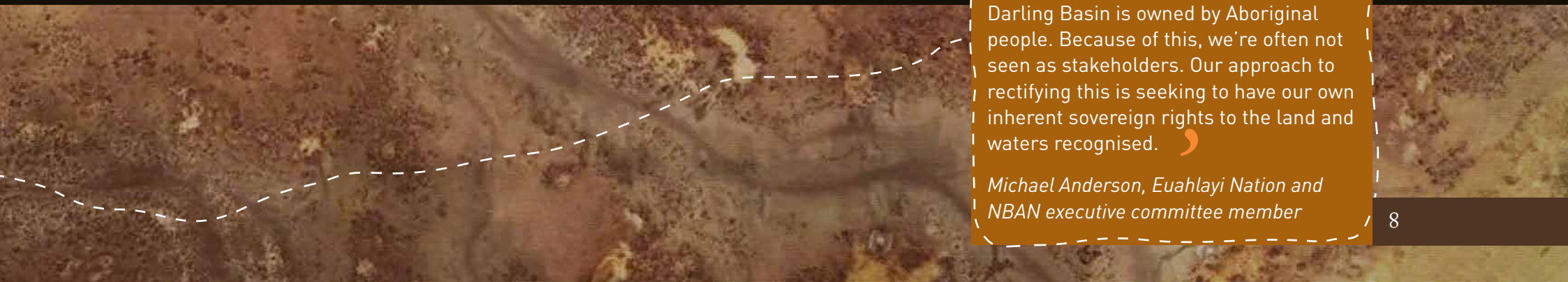
Aboriginal people from across the Basin say **cultural flows** should be provided to ensure there is enough water for people to conduct their **ceremonial business** when it is seasonally appropriate.

Aboriginal people have said they want **meaningful active involvement** in natural resource management and the operation of the rivers. There should be **proper resourcing** to allow men, women, Elders and young people to have access to their **important places** and be actively involved in **caring for their country.**

Aboriginal people are **concerned** about the decline in water quality, introduced species and the impact of chemicals and fertilisers on the health of the river. As Maljangapa Elder William Riley says,

'You can't catch fish in a pipeline.'

Aboriginal people seek **further recognition** and resourcing for the two Aboriginal representative organisations in the Murray–Darling Basin, the Murray Lower Darling Rivers Indigenous Nations **(MLDRIN)** and the Northern Murray–Darling Basin Aboriginal Nations **(NBAN).** Together these two organisations comprise nearly all of the Aboriginal Nations in the Basin.



> As a result of historical circumstances, less than 1% of the land in the Murray–Darling Basin is owned by Aboriginal people. Because of this, we're often not seen as stakeholders. Our approach to rectifying this is seeking to have our own inherent sovereign rights to the land and waters recognised.
>
> *Michael Anderson, Euahlayi Nation and NBAN executive committee member*

What we've heard in the past year

"The river system should be free-flowing. As Aboriginal people, we are free-flowing. Non-Aboriginal people like to put things in boxes. The system is becoming dysfunctional and sick. We are feeling the impact of this and we are becoming dysfunctional and sick – socially, economically and culturally."

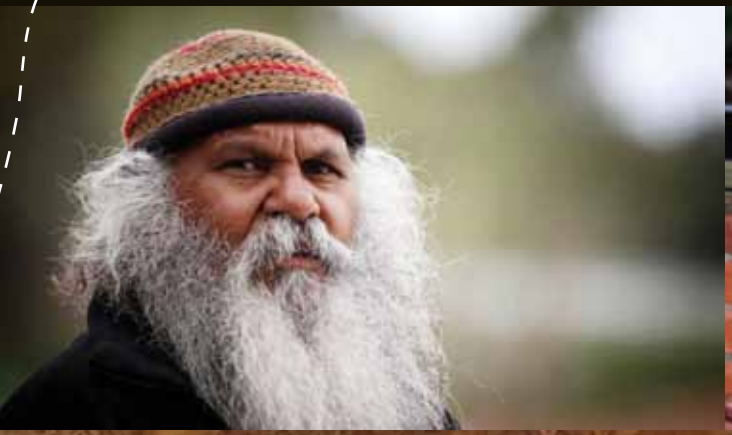
Matt Rigney, Ngarrindjeri Elder (deceased)

"Sending an environmental flow down the river doesn't fulfil our cultural requirements. We need to look outside the square – this is our economy and social structure. They're trying to bundle us in with 'rural groups', 'school groups' etc. What I would like to say is that there is another community out there."

Robert Lacey, Mandandanji Nation

"I'm going to put this bluntly: Water is our life."

Trish Johnson, Paakantyi Nation and NBAN executive committee member



"This land is part of us and we are part of it. We will always be here. We will always be part of this land.

Aboriginal people will always be in this country, in this part of the world.

We are the oldest living culture in the world. We should lead the way."

Major Sumner, Ngarrindjeri Nation

"The rivers give us such a sense of peace and contentment that we are drawn back time and time again."

Margaret Seckold, Budjiti Nation and NBAN executive committee member

"The river is our bloodline. It's been culturally used by my people forever."

Uncle Ramsay Freeman, Wiradjuri Elder and MLDRIN executive committee member

*‘**This river is part of who we are.***

It is about respecting that traditional knowledge.
To bring it into the twenty-first century, and to put it as two words:
‘cultural flows’

It is very important to us.’

Cheryl Buchanan
Kooma (Gwamu) Nation
NBAN Deputy Chair

What Aboriginal people are saying about cultural flows

Aboriginal people within the Murray–Darling Basin talk of how the rivers sustain their life and identity. Aboriginal people not only view water as connected to the land and rivers, but also view themselves as an integral part of the river system.

The term cultural flows is new to natural resource managers. It translates the complex relationship described by Cheryl Buchanan and other Traditional Owners into the language of water planning and management.

MLDRIN and NBAN have developed and agreed on a definition of cultural flows as:

Water entitlements that are legally and beneficially owned by the Indigenous Nations and are of a sufficient and adequate quantity and quality to improve the spiritual, cultural, environmental, social and economic conditions of those Indigenous Nations. This is our inherent right.

This definition has also been adopted by the North Australian Indigenous Land and Sea Management Alliance.

How cultural flows are included in the draft Basin Plan is addressed in Part 3 of this document.

We want to know:
why is water important to you?

What changes would you like to see in the final Basin Plan?

Part 3

The draft Basin Plan

What the Plan means

The Murray–Darling Basin has been under a lot of stress as a result of past over-allocation and regulation of water — made worse by the recent millennium drought (1997–2009).

Commonwealth and state governments — as well as people and communities in the Basin — have recognised that the water-dependent places in the Murray–Darling Basin are suffering.

The Murray–Darling Basin Authority has reviewed the environmental water requirements for the rivers, associated wetlands, floodplains and billabongs.

The draft Basin Plan has determined that more water is required for the environment.

The numbers in the Plan

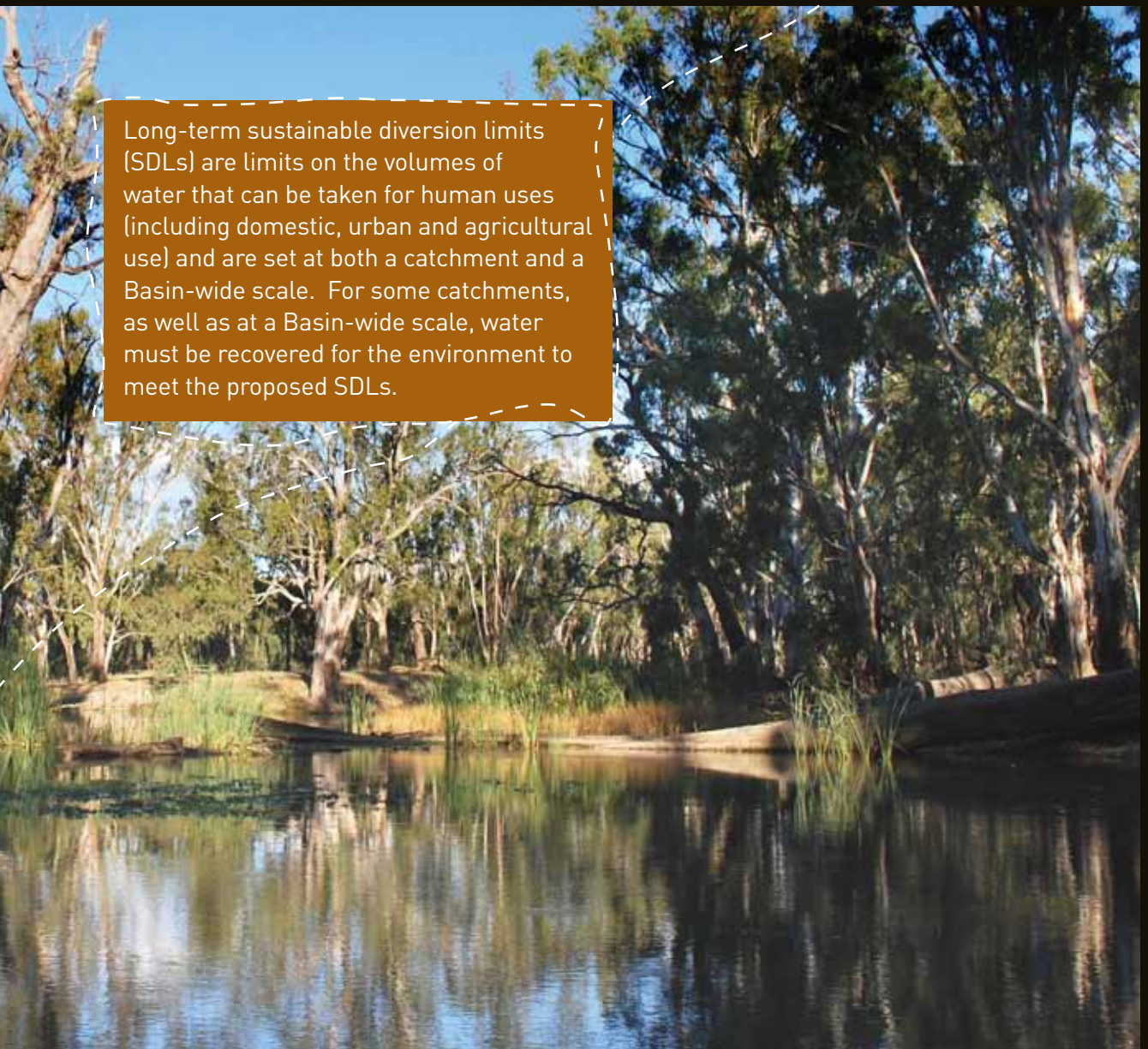
The MDBA is proposing a Basin-wide long-term average sustainable diversion limit (SDL) of 10,873 gigalitres per year (GL/y) for surface water. This encompasses 3,468 GL/y in the northern Basin and 7,405 GL/y in the southern Basin.

The baseline already takes account of around 823 GL/y on a long-term average basis that was returned to the Basin's environment before 2009.

To meet the Basin-wide SDL, a further 2,750 GL/y of water needs to be recovered (as compared to the 2009 baseline). This, plus the water recovered pre-2009, will mean that around 3,573 GL/y in total will be returned to the Basin's environment by 2019.

The Authority is also proposing a Basin-wide long-term average limit of 4,340 GL/y on groundwater use.

1 Gigalitre (1 GL) = 1 billion litres
= two times the amount of water in Sydney Harbour



Long-term sustainable diversion limits (SDLs) are limits on the volumes of water that can be taken for human uses (including domestic, urban and agricultural use) and are set at both a catchment and a Basin-wide scale. For some catchments, as well as at a Basin-wide scale, water must be recovered for the environment to meet the proposed SDLs.

The key principles

Two key principles for the development, implementation and revision of the Basin Plan are the need for adaptive management and the need for localism.

Adaptive management means the Basin Plan will change and evolve over time to incorporate new knowledge and changing priorities.

Localism is about involving communities in developing and implementing water reforms so that they have ownership of decisions and actions and are integral to adaptive management.

To find out more about the draft Basin Plan, visit www.mdba.gov.au

Influences on the Basin Plan

The big picture

These laws and policies influence the Basin Plan and include references to Indigenous people.

- The *Water Act* says that the Basin Plan must be developed having regard to 'social, cultural, Indigenous and other public benefit issues' (see page 31)
- The *National Water Initiative* (not a law but a policy the Basin Plan must follow), requires water entitlements and planning to recognise Indigenous needs in relation to water access and management, and requires that water plans incorporate Indigenous social, spiritual and customary objectives and strategies for achieving these objectives (see page 32)
- The *Ramsar Convention* provides guidelines for establishing and strengthening Indigenous participation in the management of wetlands. (see page 33)

Figure 1: Influences on the Basin Plan

References to Indigenous interests in the draft Basin Plan

The following pages highlight the parts of the draft Basin Plan that are most relevant to Indigenous people.

These sections are called:

- Environmental Watering Plan (Chapter 7)
- Water Resource Plans (Chapter 9)
- Basin water resources and the context for their use (Schedule 1)

The following pages will explain what these sections are, what they do, and what they might mean for Aboriginal people in the Basin.

Draft Basin Plan documents

- Delivering a healthy working Basin — *about the draft Basin Plan*
- The Draft Basin Plan: Catchment by Catchment
- Proposed Basin Plan — a draft for consultation
- Plain English summary of the proposed Basin Plan — including explanatory notes

These documents can be viewed on the MDBA website (www.mdba.gov.au) or ordered by calling 1800 230 067

Environmental Watering Plan

Chapter 7 of the draft Basin Plan

What is the Environmental Watering Plan?

This chapter of the draft Basin Plan provides a set of guidelines that will direct how environmental water will be managed to protect and restore rivers and wetlands.

It will consider the volume of flows, timing of flows, seasonal factors and availability of water.

The rules consider the environment at both the whole-of-Basin and local water resource plan area scales. They also consider the environment on both an annual and long-term basis.

The Environmental Watering Plan will enable many wetlands and floodplains to be inundated more frequently in the most efficient and effective way.

When will the Environmental Watering Plan take effect?

The Environmental Watering Plan will take effect when the Basin Plan is adopted and will be reviewed again in 2015.

How will it work?

The MDBA and the Basin states are responsible for different parts of the Environmental Watering Plan framework set out in the Basin Plan.

The MDBA must prepare annual watering priorities for the whole of the Basin.

The Basin states will develop long-term environmental watering plans for each water resource plan area in consultation with communities.

The MDBA will consult with MLDRIN and NBAN when setting Basin-wide annual environmental watering priorities. Basin states will also consult with Indigenous communities, MLDRIN and NBAN on long-term environmental watering plans.

The *Commonwealth Environmental Water Holder* gets its water through water–saving infrastructure (e.g: lining of irrigation channels to stop seepage) and water buy–backs from people who voluntarily sell their water.

What are environmental watering priorities?

The draft Basin Plan includes rules on how to decide which parts of the environment need water and what are the most important areas to water on a year by year basis. These are environmental watering priorities.

These rules include the need to be consistent with relevant international agreements like the *Ramsar Convention*, and to think about how the rivers, groundwater and wetlands are connected.

Where will water for the environment come from?

Water for the environment will come from increased efficiencies in water use (water conservation measures) and from the Commonwealth Environmental Water Holder.

How are Indigenous people involved in the Environmental Watering Plans?

The following page is an excerpt from the Environmental Watering Plan chapter of the draft Basin Plan. It shows how the MDBA and Basin states will engage with Traditional Owners to determine environmental watering priorities.

Excerpt from the draft Basin Plan

Environmental Watering Plan — Chapter 7

PART 4 — Environmental Management Framework

Division 4 Basin annual environmental watering priorities

7.25 Authority must prepare Basin annual environmental watering priorities

(3) When preparing the Basin annual environmental watering priorities, the Authority must have regard to the following:

(g) social, spiritual and cultural values of Indigenous people, as determined through consultation with traditional Indigenous owner organisations, where these align with or enhance environmental outcomes;

PART 7 — Principles to be applied in environmental watering

Division 1 Principles to be applied in environmental watering

7.44 Principle 3 – Maximising environmental benefits

Subject to the principles in sections 7.42 and 7.43, environmental watering is to be undertaken in a way that:

(b) maximises its benefits and effectiveness by:

(iv) giving effect to social, spiritual and cultural values of Indigenous people, as determined through consultation with traditional Indigenous owner organisations, where these align with or enhance environmental outcomes;

Water Resource Plans

Chapter 9 of the draft Basin Plan

What are water resource plans?

This chapter of the draft Basin Plan sets a framework (or set of rules) for Basin states to follow when they write up their water resource plans (WRPs) for each water resource plan area.

The Basin states will keep 'on-the-ground' control and responsibility in managing these water resources.

Water resource plans set out how water will be managed and allocated over a ten-year period in each water resource plan area.

What is a water resource plan area?

A water resource plan area is a geographical area, of which there are 19 for surface water and 23 for groundwater. Maps of the water resource plan areas can be seen on pages 23–24 of this document.

As far as possible, boundaries of these water resource plan areas have been drawn to match those of existing water management areas.

What is in each water resource plan?

Each water resource plan includes rules for things such as:

- objectives and outcomes based on Indigenous values and uses including having regard to cultural flows (see page 21)
- long-term average sustainable diversion limits (SDLs) (see page 14)
- how water can be taken (e.g. by dams)
- planning for environmental watering (see page 17)
- water quality and salinity objectives
- monitoring and reporting requirements.

How does it work?

The Basin Plan will ensure that water resource plans use relevant local and on-ground knowledge.

Opportunities for local input have been built into the draft Basin Plan to ensure that communities are given the chance to have their say. Localism is critical.

State and Territory Governments will consult with Indigenous people and local communities when developing their water resource plans.

When will the water resource plans be legally enforceable?

Water resource plans will be presented to the Commonwealth Water Minister for accreditation and will come into effect in 2019.

The MDBA has committed to seeking the advice of MLDRIN and NBAN as part of this approval process.

Accreditation of water resource plans will commence from 2012, giving the Basin states time (7 years) to adapt current plans and programs to the new framework.

How do the water resource plan rules recognise Indigenous water values and uses?

The following pages show an excerpt from the Water Resource Plan chapter of the draft Basin Plan.

PART 14 — Indigenous values and uses

Note: If a water resource plan is prepared by a Basin State, it is expected that the Authority will consult with relevant Indigenous organisations in relation to whether the requirements of this PART have been met, for the purposes of paragraph 63(3)(b) of the Act.

9.56 Objectives and outcomes based on Indigenous values and uses

(1) A water resource plan must identify:

(a) the objectives of Indigenous people in relation to managing the water resources of the water resource plan area; and

(b) the outcomes for the management of the water resources of the water resource plan area that are desired by Indigenous people.

(2) In identifying the matters set out in subsection (1), regard must be had to:

(a) the social, spiritual and cultural values of Indigenous people that relate to the water resources of the water resource plan area (*Indigenous values*); and

(b) the social, spiritual and cultural uses of the water resources of the water resource plan area by Indigenous people (*Indigenous uses*);

as determined through consultation with relevant Indigenous organisations, including the Murray Lower Darling Rivers Indigenous Nations and the Northern Murray–Darling Basin Aboriginal Nations, where appropriate.

(3) The water resource plan must be prepared having regard to the desirability of minimising any risks to Indigenous values and Indigenous uses arising from the use and management of the water resources of the water resource plan area.

(4) The water resource plan may identify opportunities to strengthen the protection of Indigenous values and Indigenous uses in accordance with the objectives and outcomes identified under subsection (1).

9.57 Consultation and preparation of water resource plan

(1) A water resource plan must be prepared having regard to consultation undertaken cooperatively and in good faith with relevant Indigenous organisations with respect to the matters identified under section 9.56 and the following matters:

(a) native title rights, native title claims and Indigenous Land Use Agreements provided for by the *Native Title Act 1993* in relation to the water resources of the water resource plan area;

(b) inclusion of Indigenous representation in the preparation and implementation of the plan, where possible;

(c) Indigenous social, cultural, spiritual and customary objectives, and strategies for achieving these objectives where possible;

(d) encouragement of active and informed participation of Indigenous people.

Note: For examples of the principles that may be applied in relation to the participation of Indigenous people, see the document titled 'MLDRIN and NBAN Principles of Indigenous Engagement in the Murray–Darling Basin'.

9.58 Cultural flows

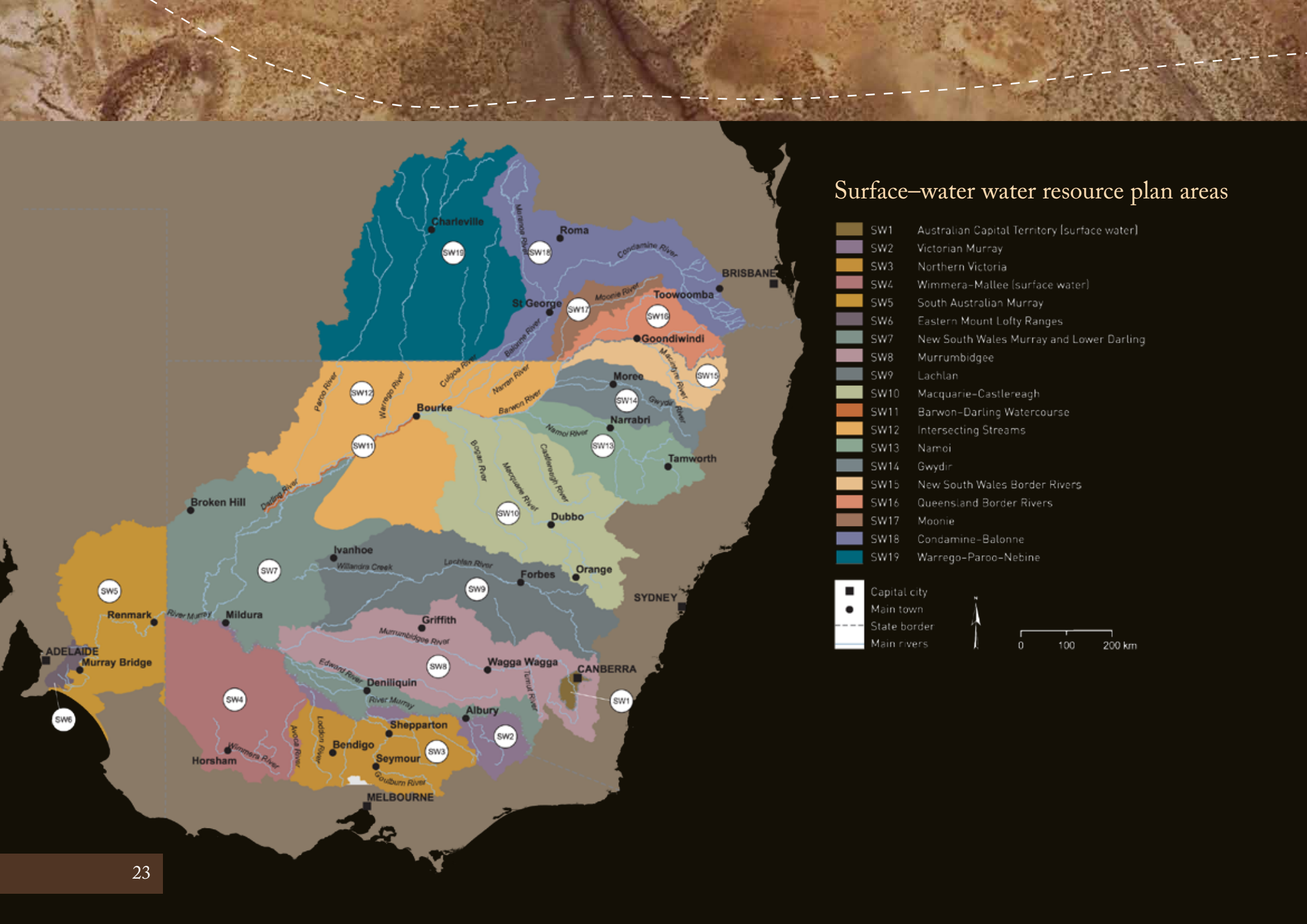
A water resource plan must be prepared having regard to the views of Indigenous people with respect to cultural flows.

9.59 Retention of current protection

A water resource plan must provide at least the same level of protection of Indigenous values and Indigenous uses as provided in:

(a) a transitional water resource plan for the water resource plan area; or

(b) an interim water resource plan for the water resource plan area.


Surface–water water resource plan areas
SW1 Australian Capital Territory (surface water)
SW2 Victorian Murray
SW3 Northern Victoria
SW4 Wimmera–Mallee (surface water)
SW5 South Australian Murray
SW6 Eastern Mount Lofty Ranges
SW7 New South Wales Murray and Lower Darling
SW8 Murrumbidgee
SW9 Lachlan
SW10 Macquarie–Castlereagh
SW11 Barwon–Darling Watercourse
SW12 Intersecting Streams
SW13 Namoi
SW14 Gwydir
SW15 New South Wales Border Rivers
SW16 Queensland Border Rivers
SW17 Moonie
SW18 Condamine–Balonne
SW19 Warrego–Paroo–Nebine
Capital city
Main town
State border
Main rivers
0
100
200 km
Charleville
Roma
Toowoomba
St George
Goondiwindi
BRISBANE
Moree
Narrabri
Tamworth
Bourke
Broken Hill
Dubbo
Ivanhoe
Forbes
Orange
SYDNEY
Renmark
Mildura
Griffith
Wagga Wagga
CANBERRA
ADELAIDE
Murray Bridge
Deniliquin
Albury
Shepparton
Bendigo
Seymour
Horsham
MELBOURNE
Warrego River
Paroo River
Culgoa River
Narran River
Barwon River
Balonne River
Moonie River
Condamine River
Macintyre River
Gwydir River
Namoi River
Castlereagh River
Macquarie River
Bogan River
Lachlan River
Willandra Creek
Darling River
River Murray
Murrumbidgee River
Edward River
Lodden River
Avoca River
Wimmera River
Goulburn River
Tenut River
SW1
SW2
SW3
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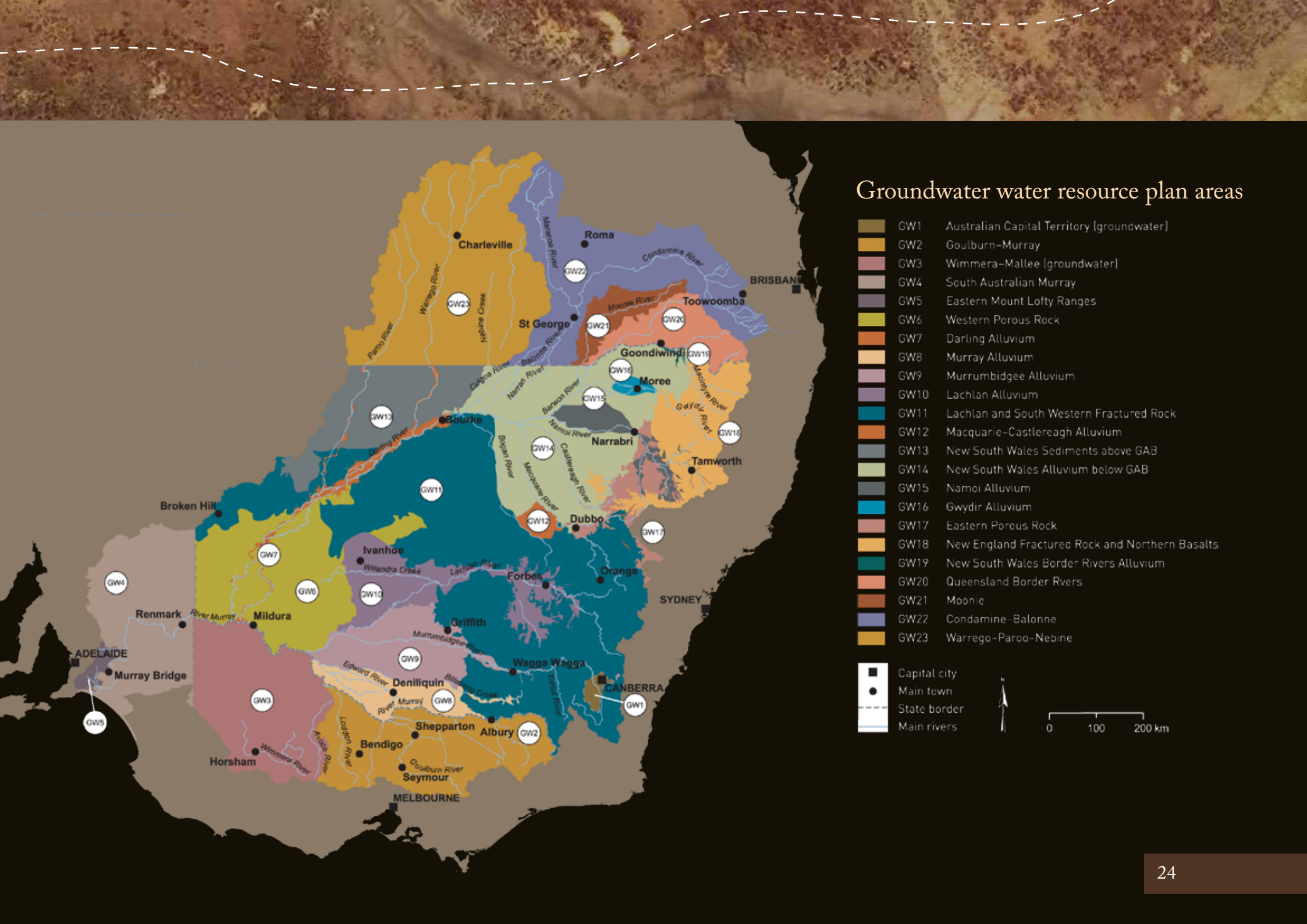

Groundwater water resource plan areas
GW1 Australian Capital Territory (groundwater)
GW2 Goulburn-Murray
GW3 Wimmera-Mallee (groundwater)
GW4 South Australian Murray
GW5 Eastern Mount Lofty Ranges
GW6 Western Porous Rock
GW7 Darling Alluvium
GW8 Murray Alluvium
GW9 Murrumbidgee Alluvium
GW10 Lachlan Alluvium
GW11 Lachlan and South Western Fractured Rock
GW12 Macquarie-Castlereagh Alluvium
GW13 New South Wales Sediments above GAB
GW14 New South Wales Alluvium below GAB
GW15 Namoi Alluvium
GW16 Gwydir Alluvium
GW17 Eastern Porous Rock
GW18 New England Fractured Rock and Northern Basalts
GW19 New South Wales Border Rivers Alluvium
GW20 Queensland Border Rvers
GW21 Moonie
GW22 Condamine-Balonne
GW23 Warrego-Paroo-Nebine
Capital city
Main town
State border
Main rivers
0 100 200 km
Charleville
Roma
BRISBANE
Toowoomba
St George
Goondiwindi
Moree
Bourke
Narrabri
Tamworth
Dubbo
Broken Hill
Ivanhoe
Forbes
Orange
SYDNEY
Renmark
Mildura
Griffith
Wagga Wagga
ADELAIDE
Murray Bridge
Deniliquin
CANBERRA
Shepparton
Albury
Bendigo
Horsham
Seymour
MELBOURNE
Darling River
Barwon River
Namoi River
Castlereagh River
Lachlan River
Murrumbidgee River
River Murray
Goulburn River

How water resource plans and environmental watering plans work together

Environmental watering plans will provide strategic priorities to be followed in the water resource plans.

The water resource plans will also take into account many other priorities and considerations (other than environmental watering) such as Indigenous water values and uses and water access rights.

In the development of these plans, Basin states must consult with MLDRIN, NBAN and other Indigenous organisations as appropriate.

Until the water resource plans come into action, the Basin states will work with the Commonwealth Environmental Water Holder and other environmental water holders to plan and carry out environmental watering.

Basin water resources and the context for their use

Schedule 1 of the draft Basin Plan

What is Schedule 1: Basin water resources and the context for their use?

The Water Act states that Schedule 1 should provide information about the uses to which the Basin water resources are put (including by Indigenous people).

This section must describe Aboriginal values and uses.

What is the purpose of Schedule 1?

The purpose of Schedule 1 is to describe the current aspects of the Basin. Schedule 1 is an overview, and sets the context for the Basin Plan.

What does Schedule 1 say about Aboriginal people?

The following text includes extracts from Schedule 1 of the draft Basin Plan.

Excerpt from the draft Basin Plan
Schedule 1 of the draft Basin Plan

Indigenous use

65. Australia has been home to Indigenous people for tens of thousands of years, sustaining cultural, social, economic and spiritual life. Indigenous people along the Murray and Darling rivers and throughout the Murray–Darling Basin talk of their deep relationship with the rivers. Trade routes, major gathering places and sacred sites exist across the Basin and continue to hold great significance for over 40 Indigenous nations. Twenty-two nations in the north of the Basin are represented by the Northern Murray–Darling Basin Aboriginal Nations, and 21 in the south of the Basin are represented by the Murray Lower Darling Rivers Indigenous Nations.

66. Indigenous people have multiple interests in the water resources of the Murray–Darling Basin, including cultural, social, environmental, spiritual and economic interests. These interests include hunting or gathering food and other items for use that alleviate the need to purchase similar items and

the use of water to support businesses in industries such as pastoralism and horticulture. The environmental health of the Murray–Darling Basin is of paramount importance in serving these interests. Indigenous people view water as inextricably connected to the land and rivers, and view themselves as an integral part of the river system. Because of this holistic understanding and connection, Indigenous people feel a deep responsibility for the health of rivers.

67. The concept of cultural flows helps to translate the complex relationship described above into the language of water planning and management. The provision of cultural flows has potential benefits for Indigenous people, such as improved health, wellbeing and empowerment from being able to care for their country and undertake cultural activities. It also provides an important and respectful acknowledgement of their culture, traditional knowledge, and spiritual attachment to place.

68. Indigenous bodies hold an estimated 81 water licences in the Basin. Under four state licensing regimes not all licences include a designated water allocation. Water that is allocated in the 81 licences totals some 8,237 ML. Of this, 2,601 ML is classified as 'High Security' or 'Reliable'. Most licences are in the regions of Macquarie–Castlereagh, Lower Darling, Lachlan, Murrumbidgee, Murray and Goulburn–Broken. Two water licences are held in the Victorian portion of the Basin associated with properties held by the Indigenous Land Corporation (Arthur, 2010).

69. Aboriginal groups hold an estimated 75 parcels of land in the Basin totalling 3,445 km^2, representing less than 1% of the whole Basin. The majority of this land has been obtained through the Indigenous Land Corporation on behalf of Indigenous groups and is inalienable freehold title (Arthur, 2010). The extent to which Indigenous groups may obtain control or influence over land that is subject to native title determination or to Indigenous Land Use Agreements is variable ranging from agreements for access, hunting and fishing to particular commercial arrangements. They rarely provide for exclusive control of land. Approximately 339,236 km^2, around 33% of the Basin, is subject to native title application. Native title has been found to exist over some 8,307 km^2 of the Basin, principally in the regions of Murray and Wimmera–Avoca. Some 101,457 km^2, around 10% of the Basin, is subject to Indigenous Land Use Agreements under native title. Agreements have been established mostly in parts of the regions of Paroo, Condamine–Balonne, Murrumbidgee, Murray, Wimmera–Avoca and Loddon (Arthur, 2010).

Putting the Basin Plan into action

Basin Plan

A high–level plan for sustainable water use in the Basin that will change over time as we learn more

Sustainable Diversion Limits (SDLs)

Environmental Watering Plan (EWP)

Water quality and salinity management

Requirements for Basin State Water Resource Plans

Critical Human Water needs (CHWN)

Monitoring and evaluation

2012–2019

Basin State water resource plans and environmental watering plans

States prepare water resource plans and environmental watering plans consistent with the Basin Plan. States and the MDBA have to consult with Aboriginal people and include Aboriginal peoples' values about water.

The MDBA (in consultation with Traditional Owner organisations and other stakeholders) will advise the Federal Water Minister who accredits the water resource plans and makes them law.

The Basin Plan and water resource plans will be regularly reviewed and improved over time

Figure 2: Implementation of the Basin Plan

Part 4

The next steps

Have your say on the draft Basin Plan

Make a submission in person

The Murray–Darling Basin Authority will visit 22 towns to talk with Indigenous communities during the 20-week consultation period on the draft Basin Plan.

There will be independent people available to help you write your submission if you wish. There will also be MDBA staff available to help explain the draft Basin Plan.

To see a list of the towns that will be visited, please refer to the MDBA website.

Lodging a submission

Mail a submission:

Draft Basin Plan
Murray–Darling Basin Authority
GPO Box 3001
Canberra City ACT 2601

Email a submission:
submissions@mdba.gov.au

Fax a submission: (02) 6279 0558

For assistance with lodging a submission please call **1800 230 067**

To find out more about the draft Basin Plan, visit our website: www.mdba.gov.au

What will happen to your submission?

When the Murray–Darling Basin Authority receives your submission on the draft Basin Plan, we will let you know it has been received.

What is said in your submissions will be considered in the process of writing the final Basin Plan.

All submissions will be published on the MDBA website for other people to read. If you do not wish for your submission to be published, either notify the person assisting you to write the submission, or if you are using the website simply choose the appropriate box.

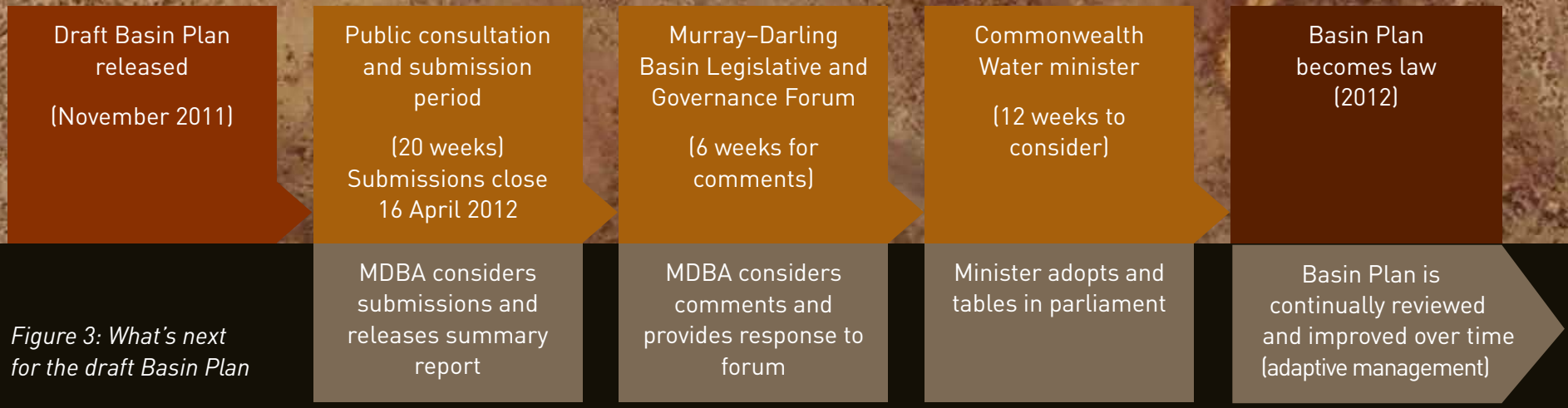


Figure 3: What's next for the draft Basin Plan

Reviewing submissions

The MDBA will consider all submissions on the draft Basin Plan before finalising the Basin Plan.

There may be legal or other reasons why some comments do not result in changes to the Basin Plan.

The Basin Plan will be passed into law in 2012.

The Basin Plan will be reviewed (and changed if necessary) in 2015, 2022 and every 10 years after that.

Cultural flows research

The National Cultural Flows Planning and Research Committee (NCFPRC) has commenced work on research that will better explain cultural flows and help satisfy the need for more detailed information on cultural flows.

The NCFPRC was established in March 2011. Its members represent the First Peoples Water Engagement Council, MLDRIN, NBAN, the North Australian Indigenous Land and Sea Management Alliance and the Noongar South West Aboriginal Land and Sea Council.

The outcomes of this research will assist Indigenous leaders to argue for greater recognition in water management. It will also help Indigenous people to obtain cultural water and influence future versions of the Basin Plan.

In particular, the cultural flows research will use case studies to identify Indigenous water values and uses, volumes of water that provide for those values and uses, and propose management options for cultural flows. It will also help to build capacity around research and water management for Indigenous leaders and communities directly involved.

Part 5 More detailed information

This section contains extracts from the *Water Act*, the *National Water Initiative*, the *Ramsar Convention* and the *United Nations Declaration on the Rights of Indigenous Peoples*. The extracts we have included are relevant for Aboriginal people.

These documents are important when it comes to including Indigenous water values and uses (cultural flows) in water planning and management.

- *The Water Act* determines what must be in the Basin Plan.
- *The National Water Initiative* determines the things the Basin Plan must have regard to.
- *The Ramsar Convention* has Guidelines to inform the Basin Plan.
- *The United Nations Declaration on the Rights of Indigenous Peoples* is not law but the Australian Government has signed it and, where possible, will take it into consideration.

The Water Act

The *Water Act 2007,* which governs the requirements for the Basin Plan, does not refer to cultural flows directly.

However, the *Water Act* does not prevent the MDBA from considering cultural flows.

In the *Water Act*:

- *Section 3(c)* in the *Objects* provision and *20(d)* concerning the purpose of the Plan refer to 'economic, social and environmental outcomes'.
- *Section 21(4)(a)* refers to the *principles of ecologically sustainable development*.
- *Section 21(4)(c)(i)* requires the Basin Plan to have regard to the *National Water Initiative* (NWI). The NWI requires that State water plans incorporate Indigenous 'social, spiritual and customary objectives and strategies for achieving these objectives wherever they can be developed'.
- *Section 21 (4)(c)(v)* requires the Basin Plan be developed having regard to the 'social, cultural, Indigenous and other public benefit issues'.
- *Section 86A* requires the Basin Plan to have regard to critical human water needs.

  Note: The term 'critical human water needs' is referring to basic human requirements **in drought or other exceptional circumstances** that affect water quality or quantity. It is the water required for core human needs (e.g. drinking, food preparation and hygiene), for essential community services (including emergency services, hospitals and schools) and for limited commercial and industrial purposes. As such, it is only a fraction of normal town water use.

Critical human water needs only becomes an issue when water in the River Murray system is down to its last drop – that is, when both storage levels and inflows are extremely low. In these circumstances, water is generally no longer available for irrigation and there is only very limited or no water available for the water market to function. Such circumstances are expected to be rare, though when they do occur, critical human water needs are the highest priority water use for communities dependent on the River Murray system.

The National Water Initiative

Section 21(4) (c)(i) of the *Water Act* states that in preparing the Basin Plan and where the Authority and the Minister exercise their powers they must have regard to the *National Water Initiative*.

The following outlines *National Water Initiative* requirements for Indigenous involvement in water planning:

- *25 (ix)*
  Water access entitlements and planning frameworks will recognise Indigenous needs in relation to water access and management.
- *52 (i)*
  Planning processes must ensure inclusion of Indigenous representatives in water planning wherever possible. Water plans will incorporate Indigenous social, spiritual and customary objectives and strategies for achieving these objectives wherever they can be developed.
- *53*
  Water planning processes will take account of the possible existence of native title rights to water. States note that Plans may need to allocate water to native title holders following recognition of native title rights.
- *Schedule E 1 (vi)*
  Water Plans to include description of users and uses of water including 'consideration of Indigenous water use'.

'Emu weave'
by Debbie Flower,
Wamba Wamba Nation

The Ramsar Convention on Wetlands

Section 21 of the *Water Act* states that the Basin Plan must be prepared so as to give effect to relevant international agreements including *The Ramsar Convention on Wetlands*. The *Ramsar Convention* refers to *Handbook 7: Participatory skills establishing and strengthening local communities and Indigenous people's participation in the management of wetlands*. This handbook is a useful reference for engaging with Aboriginal communities.

These guidelines identify a number of important considerations for the involvement of Indigenous people in the management of wetlands. These include:

- developing participatory management arrangements
- developing trust among stakeholders
- providing flexibility
- ensuring knowledge exchange and Indigenous capacity building
- establishing continuity of resources and effort
- engaging local and Indigenous people

Please refer to the Guidelines on the Ramsar website: http://www.ramsar.org.au

The UN Declaration on the Rights of Indigenous Peoples

This Declaration is not Australian law but the Australian Government has signed it.

Below are the relevant extracts from the *UN Declaration on the Rights of Indigenous Peoples* which relate to Indigenous peoples and natural resource management.

Participation in decision making

Article 18

- Indigenous peoples have the right to participate in decision-making in matters which would affect their rights, through representatives chosen by themselves in accordance with their own procedures, as well as to maintain and develop their own indigenous decision-making institutions.

Development priorities

Article 23

- Indigenous peoples have the right to determine and develop priorities and strategies for exercising their right to development. In particular, indigenous peoples have the right to be actively involved in developing and determining health, housing and other economic and social programmes affecting them and, as far as possible, to administer such programmes through their own institutions.

Spiritual relationship with lands and waters

Article 25

- Indigenous peoples have the right to maintain and strengthen their distinctive spiritual relationship with their traditionally owned or otherwise occupied and used lands, territories, waters and coastal seas and other resources and to uphold their responsibilities to future generations in this regard.

Rights to land

Article 26

- Indigenous peoples have the right to the lands, territories and resources which they have traditionally owned, occupied or otherwise used or acquired.
- Indigenous peoples have the right to own, use, develop and control the lands, territories and resources that they possess by reason of traditional ownership or other traditional occupation or use, as well as those which they have otherwise acquired.

- States shall give legal recognition and protection to these lands, territories and resources. Such recognition shall be conducted with due respect to the customs, traditions and land tenure systems of the indigenous peoples concerned.

Environmental conservation and protection

Article 29

- Indigenous peoples have the right to the conservation and protection of the environment and the productive capacity of their lands or territories and resources.
- States shall establish and implement assistance programmes for indigenous peoples for such conservation and protection, without discrimination.

Cultural heritage

Article 31

- Indigenous peoples have the right to maintain, control, protect and develop their cultural heritage, traditional knowledge and traditional cultural expressions, as well as the manifestations of their sciences, technologies and cultures, including human and genetic resources, seeds, medicines, knowledge of the properties of fauna and flora, oral traditions, literatures, designs, sports and traditional games and visual and performing arts.
  They also have the right to maintain, control, protect and develop their intellectual property over such cultural heritage, traditional knowledge, and traditional cultural expressions.

Planning for land use

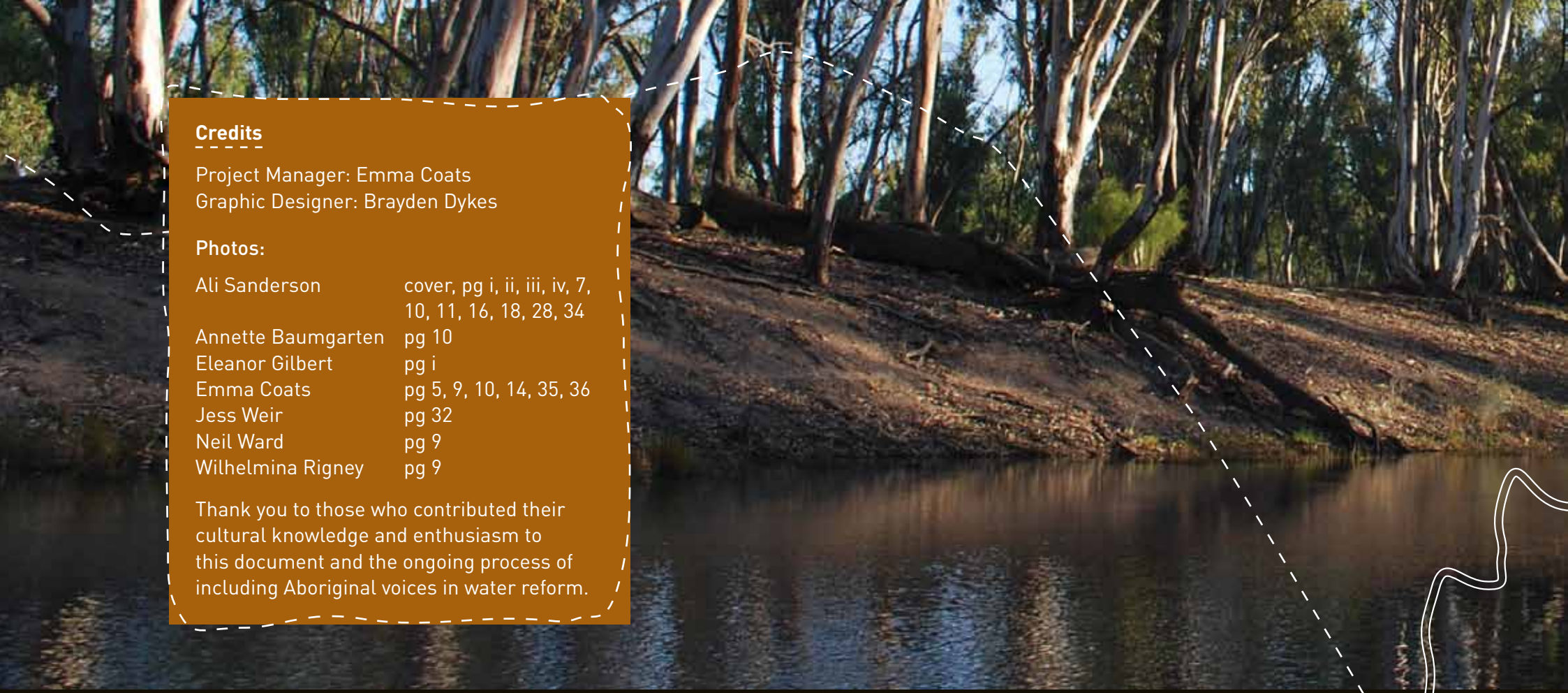
Article 32

- Indigenous peoples have the right to determine and develop priorities and strategies for the development or use of their lands or territories and other resources.
- States shall consult and cooperate in good faith with the indigenous peoples concerned through their own representative institutions in order to obtain their free and informed consent prior to the approval of any project affecting their lands or territories and other resources, particularly in connection with the development, utilization or exploitation of mineral, water or other resources.
- States shall provide effective mechanisms for just and fair redress for any such activities, and appropriate measures shall be taken to mitigate adverse environmental, economic, social, cultural or spiritual impact.

Institutional structures

Article 34

- Indigenous peoples have the right to promote, develop and maintain their institutional structures and their distinctive customs, spirituality, traditions, procedures, practices and, in the cases where they exist, juridical systems or customs, in accordance with international human rights standards.



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Emma Coats	pg 5, 9, 10, 14, 35, 36
Jess Weir	pg 32
Neil Ward	pg 9
Wilhelmina Rigney	pg 9

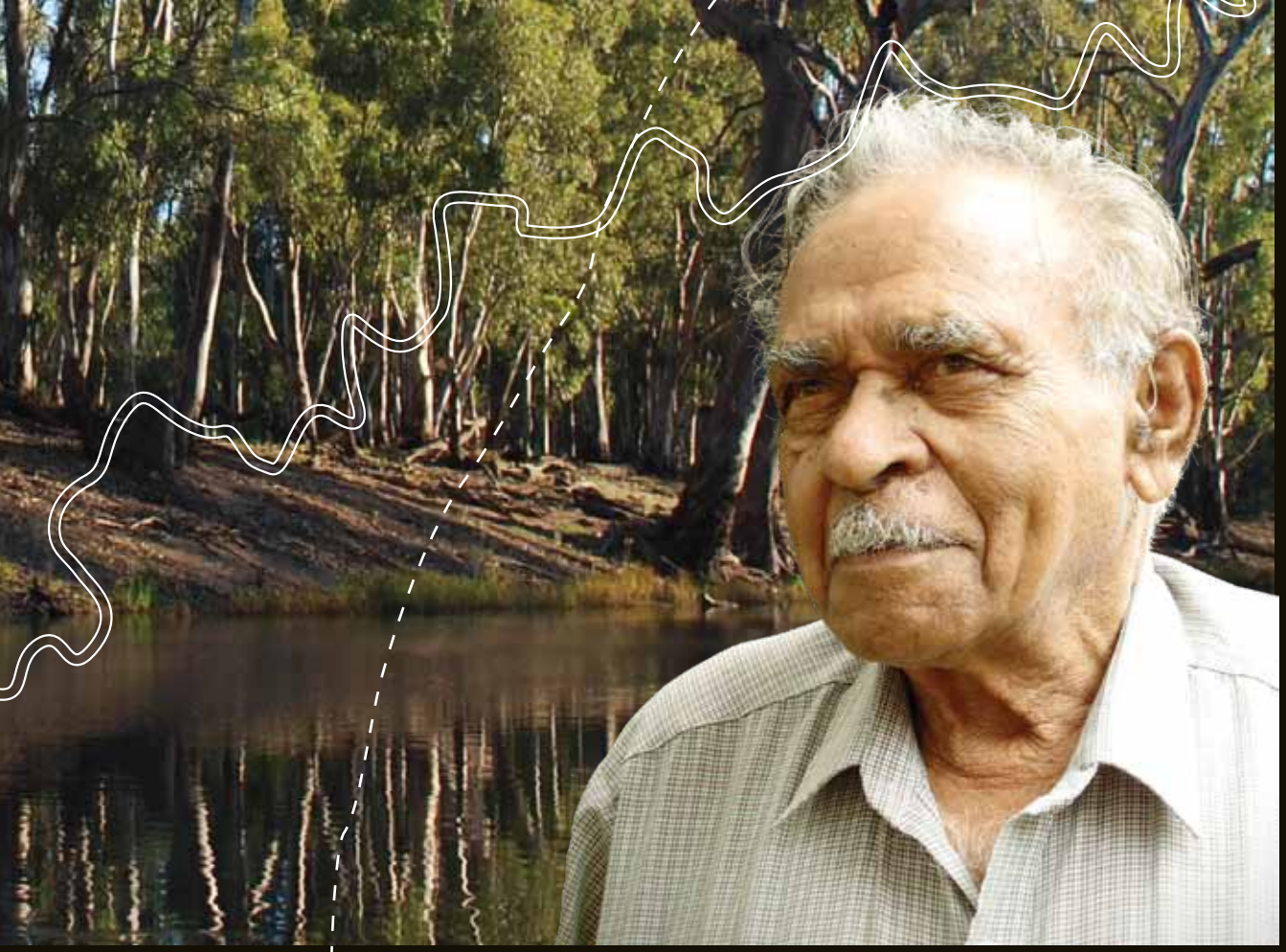
Thank you to those who contributed their cultural knowledge and enthusiasm to this document and the ongoing process of including Aboriginal voices in water reform.

The River

The river is life, it flows like our blood
From its humble beginnings to its raging flood
With a small start it grows like a child
Sometimes restless sometimes wild
On its endless journey the river runs
Watching silently by majestic red gums.

The river has a spirit, it has a soul
Its ancient people's history is still being told
Where the plants, animals, birds and the fish belong
The dreaming stories are told in dance and song
The spirit of the people who know no end
Flow like the river from beginning to end.

Written by Ernie Innes, Taungurung Elder



Let's do it as a Nation

As I sit here tonight thinking
How our country's drying out
I fully know the reason being
This ten year man-made drought.
They've dammed our upper tributaries
To saturate their cotton
While smaller farmers further down
Are totally forgotten.
Inland rivers have stopped flowing
With our livestock being bogged
We curse the upstate irrigators
Where our water's being hogged.
But just look at what it's doing
To our fauna and our flora
We're heading down the poor road
And getting even poorer.
They've killed our lakes and wetlands
That used to feed the Murray
So if we're going to fix this problem
SAY let's do it in a hurry.
But to overcome our problems
We must bypass our politicians
And take it to the World Heritage
And force a Royal Commission.
But to get things really moving
And stop further degradation
We must all rise, get off our butts
And do it as a Nation.
LET'S DO IT AS NATION
MEANING BLACK AND WHITE COMMUNITIES

Written by William Riley, Maljangapa Elder

Indigenous Engagement Principles
for the Murray–Darling Basin Authority

The Murray–Darling Basin Authority will take a principle-based approach that ensures consistent and grounded involvement of Indigenous/Aboriginal people in natural resource management decision making.

This approach will be in accordance with both the spirit and intent of the *United Nations Declaration on the Rights of Indigenous Peoples*.

These principles focus on achieving inclusive, meaningful and effective outcomes for Indigenous/Aboriginal people within the Basin.

Principles

In carrying out its day-to-day activities, the Murray–Darling Basin Authority will:

1. Recognise that the authority and responsibility with respect to Indigenous/Aboriginal culture rests with Traditional Owners.
2. Involve Indigenous/Aboriginal people effectively, through a process of free prior and informed consent, which means that Indigenous/Aboriginal people have adequate knowledge and understanding of relevant government programs to ensure they are aware of the consequences and outcomes which may result from their contribution and any consent with regards to cultural knowledge, values and perspectives.
3. Work towards improving the capacity of Indigenous/Aboriginal people in relation to effective involvement in natural resource management.
4. Recognise that natural resource management programs have a role in delivering cultural, social, economic and environmental outcomes that are equitable and appropriate to all Indigenous/Aboriginal people; and
5. Ensure that partnerships between Indigenous/Aboriginal people and the Murray–Darling Basin Authority are based on respect, honesty, and capacity to participate equally, with shared responsibility and clearly defined accountability and authority.

These principles were endorsed by the joint gathering of Murray Lower Darling Rivers Indigenous Nations and the Northern Murray–Darling Basin Aboriginal Nations in Canberra on 16 June 2011.

Australian Government

MURRAY–DARLING BASIN AUTHORITY

Tri-State Murray NRM
Regional Alliance

Who is the Tri-State Murray Alliance?

Growing the Economy. Securing the Environment. Motivating the Community.

The Tri-State Murray NRM Regional Alliance brings together the seven natural resource bodies from New South Wales, Victoria and South Australia along the full length of the River Murray Corridor.

The Alliance was formed in 2015 recognising that where there were opportunities to work together, they could deliver better and more cost effective social, economic and environmental results. This is especially the case for rivers and adjacent landscapes where catchment and community-wide coordinated action across land and water is critical to achieve landscape change.

The Alliance Steering Committee of the CEOs oversee all activities based on the agreed Charter and Governance principles avoiding the need to establish a separate Alliance administrative entity.

1 Government of South Australia | Natural Resources SA Murray-Darling Basin
2 mallee catchment management authority
3 NSW Government Local Land Services Western
4 North Central Catchment Management Authority
5 Goulburn Broken Catchment Management Authority
6 NSW Government Local Land Services Murray
7 North East Catchment Management Authority

The challenges

The iconic Murray River, its corridor, species and people are in a condition that can't be ignored.

- The size of the challenge means that the support and participation of the community is critical. This support can be difficult to maintain as resources are stretched, the improvements are slow to emerge, tough to sustain and certain issues are resulting in significant individual or community concern.
- Water alone will not restore water dependent ecosystems and ensure the various obligations and community expectations are achieved. Appropriate ongoing complementary and coordinated activities, supported by local communities, are required at the site and system scale.
- Fragmented short-term program funding and jurisdictional boundaries drive isolated and uncoordinated works that will not achieve the environmental values, species protection, sustainable agriculture, viable industries, cultural outcomes and recreational experiences that the Australian and international communities expect.
- Traditional Owners may have access to land and water but are often limited by their access to finances, employment and business capabilities. This results in many Traditional Owners struggling to remain connected to Country and culture and increases the risk of losing more than 20,000 years of cultural and ecological knowledge.

Why the Alliance?

- Proven track record in working together and delivering coordinated infrastructure and habitat projects across three States and the length of the Murray River.
- Proven track record of connecting and delivering with regional communities; industry; private, government and not-for-profit service providers; research; and Traditional Owner groups.
- Operates at the scale relevant to the species needing recovery; to identify sustainable solutions for industry; attracting private sector partners; and connecting to Aboriginal people and the broader community.
- Works are prioritised, coordinated and communicated so that projects deliver the best 'bang for buck'.
- The significant capability and best practice approaches are shared quickly allowing for adaptive management and improved natural resource management across dryland and irrigated agriculture; biodiversity issues and climate and natural environments.

The Alliance footprint:

- Covers 21.2 million hectares
- Contributes 50% of water in the Murray-Darling system
- Home to 800,000 people
- 500 national and state recognised threatened species
- 10 internationally recognised sites
- Supports $7.2 billion in agricultural output

The programs

The Alliance has four key programs:

1. **Fish Connections** – Collaboration between science, on-ground expertise and the community have identified and described the critical complementary works needed to secure the future for the three key native fish groups – fast flow, channel and wetland specialists. Implementation is underway and progress towards the targets achieved. The Alliance and partners continue to advocate for resources to be directed to address each of the critical works and to share the latest knowledge through native fish forums.
2. **Aboriginal Economic Independence** – The Alliance provides farm planning, natural resource and agricultural assistance to emerging Aboriginal businesses and for groups to care for Country as one of the partners in the Aboriginal-led East-West Alliance. The East-West Alliance uses a co-operative Fairtrade model to link Aboriginal groups, NRM agencies and private sector partners to build businesses, improve the Country's sustainability and social and cultural links, and community resilience.
3. **Land Resilience** – This work focusses on the emerging technologies that can reduce the cost for farmers and public land managers of monitoring and managing their natural resources while adapting to the changing climate.
4. **Co-ordination and collaboration** – This program focusses on capturing the broader opportunities by sharing expertise, processes and programs; coordinating works and media campaigns and collaborating to build the capability of the community and service provider partners.

For further information, please don't hesitate to contact Fiona Johnson, Executive Officer, on 0419 130 719 or fiona.johnson23@bigpond.com

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Wetland forest culture: Indigenous activity for management change in the Southern Riverina, New South Wales

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Wetland forest culture: Indigenous activity for management change in the Southern Riverina, New South Wales

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This article applies the experience of one Indigenous organisation's activity in advocating the adoption of a cultural–environmental management approach in the forested wetlands of the Edward/Kolety and Wakool rivers, New South Wales, Australia. These experiences are analysed using the frameworks of academics' rethink of 'nature' and Indigenous people's philosophies of 'Country'. In doing so, different understandings of fact and governance are shown to have implications for natural resource and environmental management. We demonstrate how Indigenous people express attachments to place and culture as part of reconfiguring modernity to create better conditions for their knowledges and priorities. This analysis takes place in the context of degraded river ecologies, intense debates about over-allocated river systems, the transfer of riverine forest lands to the conservation estate, and the contested Indigenous presence in colonial-settler societies. This research is a partnership between the research institution and the Indigenous organisation, and involved workshops, fieldwork and semi-structured interviews.

Keywords: Werai; Yarkuwa; Murray-Darling Basin; cultural mapping; water reform

Introduction

The relationships Indigenous people hold with their traditional lands and waters, and how these relationships inform their unique contribution to land and water management, have been the subject of extensive study in Australia and internationally (Horstman & Wightman 2001; Braun 2002; Kinnane 2002; Rose 2004). A dominant theme in this literature is Indigenous people's critique of the hyper-separation of nature and culture, a Cartesian dualism that has been very influential in the natural sciences, as well as state approaches to land and water management (Scott 1998; Worster 2008). The academic critique of the nature–culture hyper-separation has led to a re-think of the integrated and interdependent profile of nature–culture relationships in the environmental sciences and other disciplines (Strathern 1980; Haraway 1988; Plumwood 1993; Nygren 1999; Ingold 2000; Latour 2001; Manning et al. 2004; Robin 2007). However, the hyper-separation of nature and culture continues to be a very powerful idea and a site of contested meaning and value in management practices. In nation states recently established by settlers on

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Indigenous territories, these disputes are also contests about Indigenous people's legal and political rights to their traditional lands and waters (Langton 1995; Tully 2004; Ross 2006/07; Hattam et al. 2007).

We consider how the challenges of the hyper-separation of nature and culture, and the contested Indigenous presence are being addressed by the activity of the Yarkuwa Indigenous Knowledge Centre Aboriginal Corporation (Yarkuwa), as part of a research collaboration between Yarkuwa and the Australian Institute of Aboriginal and Torres Strait Islander Studies (AIATSIS).[1] Our aim is to document how one organisation is responding to this complex intercultural governance context to acknowledge and support relationships valued by the traditional owners with their local ecologies. Our case study is the wetland forests of the Edward/Kolety and Wakool rivers in the Southern Riverina, New South Wales (NSW), the ancestral home of the Wamba Wamba and Perrepa Perrepa peoples.[2] The scope of our study is limited to Yarkuwa and the Edward/Kolety and Wakool rivers, and has not included other parts of Wamba Wamba and Perrepa Perrepa Country, nor the perspectives of other Indigenous and non-Indigenous organisations and governance bodies in the Edward/Kolety–Wakool. The methods include the gathering of data through workshops, meetings and interviews. AIATSIS held a workshop about the governance and management of the Edward/Kolety and Wakool rivers with the Yarkuwa board in August 2011. Jessica Weir visited the area three times in 2010 and 2011, conducting semi-structured interviews with Yarkuwa board members and staff, including Jeanette Crew and David Crew who are co-authors of this article and are the authors of Yarkuwa documents on cultural–environmental values (Yarkuwa 2008, 2009, 2012a). Interview questions were designed to elicit answers about relationships with local ecologies and strategies for greater Indigenous involvement in environmental and resource management. The fieldwork period coincided with research and consultation about the draft Murray-Darling Basin Plan, conducted in part by the Commonwealth Scientific and Industrial Research Organisation (CSIRO). To reduce redundancy for individuals, in September 2011 CSIRO and AIATSIS worked collaboratively to co-document a Yarkuwa workshop with Wamba Wamba and Perrepa Perrepa members about the effect of water reform on their cultural and historical values. For this article, the data from both the workshops and the interviews were synthesized with a review of the literature. The fieldwork also coincided with the release of two studies about specific water requirements for the Edward/Kolety and Wakool rivers and wetlands for environmental purposes (Webster 2010; Hale & SKM 2011).

This article contributes to the body of geographic scholarship rethinking knowledge practices in combination with empirical research, to uncover and bring about new ways of thinking and doing as part of broader social and ecological justice agendas (Gibson-Graham 2008; Head & Gibson 2012). In societies that are grappling with the legacies of both colonisation and rapid environmental change and devastation, Deborah Rose identifies this as 'recuperative work', an iterative process that takes place in dialogue with and among each other (Rose 2004, pp. 23–25). In this article, we set out our rethinking of knowledge practices in relation to nature, including drawing on the Indigenous philosophy of 'Country' – a term used by Indigenous people in Australia to describe their traditional lands and waters. We follow with our case study, the wetland forests of the Edward/Kolety and Wakool rivers, and a narrative that re-inserts the Indigenous presence, so often

marginalised in historical and geographic accounts (e.g. DWR 1994). We then demonstrate how Yarkuwa's work asserts their worldview and authority in Country, to generate new grounds for management change. In doing so, we reveal how Indigenous people express attachments to place and culture as part of reconfiguring modernity to create better conditions for their own existence (Escobar 2001). We focus particularly on how understandings of nature are a critical step in this process.

Rethinking nature

In Australia, Indigenous people use the term 'Country' to express a multitude of relationships they hold with their traditional lands and waters, be they relationships of sustenance, rights, care or responsibility (Rose 1996; Sutton 1995; Kinnane 2002). These relationships are held with many other beings – plants, animals, people, ancestral creators, rivers, rocks and so on – and are grounded in knowledge practices that arise out of Country, including language, land use and spirituality. The human, biophysical and supernatural are blended in this knowledge which weaves together nature and culture (Escobar 2001). This does not preclude objectifying and using natural resources, machinations about power and authority, and relationships that extend to other people, places and things found regionally, nationally and internationally. It is knowledge that is often categorised as traditional and local, but it has also always been contemporary and universal (Sahlins 1999). It includes meanings and values that transcend context, and is very much a way of living in today's Australia.

'Country' provides fertile ground for the academic rethink of nature that is underway in diverse disciplines and new interdisciplinary fields, as part of the academic response to ecological devastation and climate change. This scholarship seeks to undo the hyper-separation of nature and culture in oppositional binary relationships, which arose out of Euro-American thought in the eighteenth century and positioned humans as outside of nature, and treated animals and plants as simple matter (Mathews 1994). In this academic rethink, two conceptual integrations take place: humans are resituated within their environments; and non-humans or more-than-humans are resituated within cultural and ethical domains (Plumwood unpublished cited in Rose et al. 2012). This scholarship also seeks to overcome the privileging of the natural sciences as the authorised knowledge for understanding nature. Instead it promotes the partial objectivity of 'situated knowledges', knowledge that comes out of particular places through conversations held between actors of many different forms (Haraway 1988, pp. 581, 593). This scholarship takes a different path to postmodern research that deconstructs the objectivity of the natural sciences, to conclude nature is something we can never know, we can only know our own perceptions of it (Littlewood 1996). Instead, as humans reconnected with our environments, we know nature through the very material relationships that sustain our bodies. For environmental studies, this work does more than bring our focus to the importance of human–environment interactions, it encourages us to think about the very categories human and environment, and how these categorisations influence our understandings of fact and governance.

This is illustrated in Braun's (2002) study of a conflict over a temperate rainforest in British Columbia, whereby the separation of nature and culture is used strategically to produce different understandings of fact and thus different management

outcomes. This conflict was dominated by two lobby groups – the foresters and the environmentalists. The foresters conceived the forest as a commodity to be managed for the nation, focusing on technical expertise and scientific management, framing the issue away from social or ethical terms. The environmentalists were protecting what they considered to be pristine wilderness that needed saving from destructive humanity. Significantly, Braun identified that both the environmentalists' defence of nature and the logging advocates' exploitation drew on particular understandings of nature were exercises in erasure (Braun 2002). A shared result of the two approaches – nature as resources for the nation, and nature as wilderness – was the exclusion of the local First Nation people, the Nuu-chah-nulth. The Nuu-chah-nulth counter-argued by preparing maps of 'culturally modified trees' showing evidence of their activity in the forest, ranging from felled trees to trees stripped of bark (Braun 2002, p. 101). This evidence of continued use of the forest overturned the presupposition that the forest was just timber or 'nature', showing it was also social and cultural. Braun's analysis also reveals how rethinking nature is part of the work to decolonise settler-societies. This holds true in the Australian context, where there is a need for environmentalists to recognise that 'wilderness' is a result of thousands of years of sustainable land management by Australia's First People.

The holistic approaches that Indigenous people bring to natural resource and environmental management exposes Indigenous people's knowledges to being dismissed as unscientific, spiritual fancy, or both. Indigenous knowledge is compared unfavourably with 'expert' knowledge in dualistic discourses that assume hyper-separated oppositional relationships: magical versus rational; particular versus universal; practical versus theoretical; and traditional versus modern (Nygren 1999). In a deliberate counter, Jeanette Crew, co-author of this article, Yarkuwa Chairperson, and a Mutthi Mutthi Elder, represents Indigenous people as an enduring part of the contemporary economic practice of natural resource management. Jeanette Crew prepared a poster 'Indigenous use of natural resources' for a regional festival on the sustainable use of resources in southern NSW, which is now on display at the Yarkuwa office. On it she wrote:

> The Indigenous people of the Riverine Plain, including *Wamba Wamba, Wiradjuri, Yorta Yorta, Birrapa Birrapa, Muthi Muthi, Nari Nari,* and *Wadi Wadi,* use the natural resources of the region for food, herbs and medicines, shelter, toolmaking and trade. Indigenous people still exploit the natural resources of the Riverine Plain using a number of different technologies. This is done with land management principles in mind to ensure that resources are available for future generations. These land management principles include song, dance and ceremony, not only for the conservation of the environment, but also to ensure its continued health and fertility.

Jeanette re-works knowledge assumptions so as to change understandings of fact and governance, adapting natural resource management to a cultural context allowing for contemporary use of Country.

With an approach that recognises partial objectivity, both 'expert' and Indigenous knowledges can be creatively recruited to the challenges of environmental and natural resource management. Yarkuwa make their contribution in rural southeast Australia, where river regulation has transformed relationships between people and places; generating industry for towns and business, but on a scale that has dramatically affected river, wetland and forest health.

Country

The Edward/Kolety and Wakool rivers form an anabranch and floodplain of the Murray River, north of the Murray in southern NSW. Most of this country is Wamba Wamba and Perrepa Perrepa country. Their country is directly downstream from Yorta Yorta country where the Edward/Kolety River starts. Wamba Wamba and Perrepa Perrepa share the same language, and their names for these rivers are Mile (pronounced Milly) for the Murray and Kolety (pronounced Kol-etch) for the Edward River. Wakool (pronounced War-kool) is the Wamba Wamba and Perrepa Perrepa name for that river. As part of knowing these rivers as places of ancestral action, the traditional owners have inherited stories about how these rivers were formed by the creation snake who was cut into pieces by the crow which was disturbed at Kyalite, where the Edward/Kolety and Wakool Rivers meet (Massola 1968).

The Edward/Kolety and Wakool river network encompasses 1000 km^2 of interconnecting rivers, creeks and wetlands (Hale & SKM 2011). Forests became established here as a result of changes to the Murray River's path 25,000 years ago, when rivers and creeks, floodplains and wetlands were formed, providing the right conditions for river red gum forests to thrive (NSW NRC 2009). These river red gum and box forests are now known as the Werai group of forests (or Werai state forest block), and include the Werai, Morago, Banangalite and Barratta Creek state forests. Together, the Werai state forest block is an area of around 11,915 ha. The forested wetlands and ephemeral creeks play an important bioregional support role for native fish and birds. Permanent pools provide drought refuges for the threatened species Murray cod, trout cod, eel tailed catfish, and silver perch (Hale & SKM 2011). Lagoons, floodplain marshes and the river red gum forests together support habitat for waterbirds to breed, and significant breeding events have been observed (Hale & SKM 2011). These ecological values are recognised regionally, nationally and internationally. On the floodplains of the Murray and its anabranches (the Murray Fans region), the Werai forest is the third largest remnant of the original vegetation, and is a Ramsar wetland of international importance, as part of the NSW central Murray state forests.

It is suggested 3000 people were living in Werai forest prior to European settlement; their connection evident in the over 100 oven mounds, over 100 scarred trees and more than six traditional cemetery sites found in the Werai group (Yarkuwa 2009). In the late 1800s, some 80 Aboriginal people were forcibly removed from Werai onto missions and reserves in the surrounding area, especially Moonahcullah mission which adjoins Werai at the southwestern end (the title to Moonahcullah is now held by the Deniliquin Local Aboriginal Land Council). In the 1920s, the Werai forests became formally vested as state forests, and managed as commercial logging operations. Descendants of the 80 people moved out of the forests now form the majority of the current Aboriginal community in Deniliquin, the first town east of Werai. The traditional owners speak about their family connections to Werai forest as an important reason for ongoing use and occupancy. This activity is a tangible expression of their connection to Country.

The Werai forests and wetlands are surrounded by strikingly flat plains that are now dominated by freehold land tenures. Sheep have been an important dryland farming industry in this area. With the 1930s construction of the Mulwala Canal,

irrigation districts were established and irrigated rice became a very important industry (DWR 1994). Members of the Wamba Wamba and Perrepa Perrepa community have found employment in this rural activity, including work at the Deniliquin rice mill, and were celebrated for being 'big-gun' shearers (Hercus 1992, p. 15). The Mulwala Canal is part of a larger river and river regulation network in the Murray-Darling Basin, supporting agricultural production for domestic markets and for export, in this Australia's agricultural heartland. Here, highly variable cycles of floods and droughts have been regulated by an extensive network of dams, weirs, locks, canals and pipes built to provide water to rural communities (Powell 1989). State governments are responsible for allocating water to users, which in NSW is done through water-sharing plans under the *Water Management Act 2000* (NSW).

For the Edward/Kolety and Wakool rivers, the main altered flow regimes have been: a reduced frequency of low flows or no flows; the introduction of rapid rates of rising and falling water in channels; a reduction in the duration of moderate floods; the changed seasonality of flows and a loss of flood pulses important for breeding cues; and barriers to fish passage (Hale & SKM 2011). Water flow in the Edward/Kolety River is kept at high levels for most of the year, at or near the capacity of the river banks, so as to meet irrigation orders downstream. Areas that used to be flooded almost yearly now only receive infrequent water flows. Wamba Wamba man Leo Briggs junior has noticed the changes:

> You can tell where water used to be, and the river could be full, but there's still no water there. And then you'll have a look and there will be a levy bank somewhere (Leo Briggs junior, interview with J. Weir, 7 September 2011).

River regulation has occurred in tandem with other land use changes in the region, including land-clearing, salinity, invasive species, mining and habitat degradation from logging, grazing and other activities (Yarkuwa et al. 2009). Leo Briggs junior's father used to take him out to Werai and show him burial grounds and important swamps; today he cannot pass all of this experience on to his kids because some of these places have now gone (interview with J. Weir, 7 September 2011). Leo Briggs junior is concerned that his very personal family knowledge of Country will be quickly lost between generations. Ecological diminishment is also felt by non-Indigenous people who have experienced changes to particular places over their lifetime. However, for traditional owners, these losses are compounded by also being a loss of the unique culture held in these places, including their laws, language, identity and rights (Grinde & Johansen 1995; Weir 2009).

The profoundly connected role of water, combined with the scale of dam building, has meant that river regulation alters 'the distribution of resources across space and time, among entire communities and ecosystems' (Mitchell 2002, p. 21). Whilst the Werai forests have fared better than many other inland river ecologies, including the Coorong, the modification of relationships between the plains and the wetland forests has impacted the rights and culture of traditional owners. This modification has occurred alongside attempts to erase the political–legal territories of traditional owners; indeed the treatment of river water as a resource for the nation has been premised on their exclusion (Dodson & Strelein 2001; Brennan et al. 2005). As Jeannette Crew has said:

> These forests were our economic base for thousands of years and now provide no economic return for my people while at the same time making many non-Aboriginal people wealthy. My people's spiritual and religious connection to country are directly linked to, and cannot be separated from, the environment. (Yarkuwa 2009, p. 5)

In the first decade of the twenty-first century a severe drought persisted in the inland river country of southeast Australia. This drought resulted in the historic suspension of water sharing plans, including the November 2006 suspension of the NSW Murray and Lower Darling regulated rivers water sharing plan, which encompasses the Edward/Kolety and Wakool rivers. Contingency water sharing measures were put in place to ensure water supply for towns and communities, and regulated water flows to specific wetlands were cut off (MDBC 2007a). At the end of May 2007, the regulated flow to the Edward/Kolety–Wakool system was cut off, and the Wakool River and Merran Creek systems dried into a series of pools (MDBC 2007b). General security water licence holders had their water allocation reduced to zero. Business and agriculture in Deniliquin suffered and, in 2008, the Deniliquin rice mill, the largest in the southern hemisphere, closed (Mitch 2011).

The drought further affected the health of forests already altered by river regulation. As the drought continued, broad-based public concern about the failing health of river red gum forests led to the NSW government funding an investigation into river red gums and woodland forests in the Riverina bioregion (NSW NRC 2009). The NSW Natural Resource Commission (NRC) undertook this task, and found that the vast majority of the Werai forest trees were unhealthy (NSW NRC 2009). It reported a 2005 assessment of the central Murray state forests that recorded only 11 per cent of trees as healthy, 27 per cent as stressed and 35 per cent as highly stressed (NSW NRC 2009). Within this result, the river red gums were worse off than the black box forests, as the latter have more drought resilience. The report recognised the declining commercial values of these forests as a timber source and highlighted the many other values held in the forests, including Indigenous values.

The culmination of public concern and advice from the NRC, was the transfer of many state forest lands to the national park estate, under the *National Park Estate (Riverina Red Gum Reservations) Act 2010* (NSW). This included the vesting of the Werai forest group with the NSW State National Parks and Wildlife Minister for transfer to an Aboriginal landholding body (s. 10). This was a result of intense advocacy and lobbying by traditional owners, particularly Yarkuwa (Yarkuwa 2009, see also NSW NPA 2008). In 2011 a Werai Aboriginal Negotiating Team (WANT) was established to oversee the transfer of the land to an Aboriginal title holding body and explore the potential to declare the area as an Indigenous Protected Area (IPA). An IPA is an agreement between Indigenous people and the federal government to manage an area in alignment with conservation objectives, and is included in the national reserve system. This can include small-scale selected timber harvesting, now referred to as ecological thinning, provided that cultural and environmental values are protected.

Alongside public concern for the forests was the related concern about water scarcity and river health. This led to national water reform, including the *Water Act 2007* (Cth) which directs the Murray-Darling Basin Authority (MDBA) to develop a water management regime that returns water consumption to environmentally sustainable levels, called 'sustainable diversion limits'. This legislation also created

the Commonwealth environmental water holder to buy consumptive water entitlements to return more water to the rivers for environmental restoration and protection. Indigenous groups and organisations have been an active part of this water reform process in the Murray-Darling Basin and nationally (e.g. Behrendt and Thompson 2003; Hattam et al. 2007; MLDRIN 2007; NAILSMA 2009; Ross 2009; Jackson 2011; O'Donnell 2011).

Creative change

Yarkuwa Indigenous Knowledge Centre was formed in 2003 as a place to hold archival material, provide education and research services, undertake cultural heritage and environmental work, provide community services and, more recently, acquire land (Yarkuwa 2011a, b, 2012b). Yarkuwa active membership is formed by direct descendants of Wamba Wamba or Perrepa Perrapa peoples who have skills that benefit the organisation. Non-active members are all other direct descendants, and associate members can be any Indigenous or non-Indigenous person who wish to support Yarkuwa. Yarkuwa are but one of many different Indigenous organisations and groups active in the area encompassed by the Edward/Kolety and Wakool river network, including the Deniliquin Local Aboriginal Land Council (see further Weir et al. in press). Most members of Yarkuwa are also members of the Land Council.

Yarkuwa's strategic agenda links Indigenous and environmental issues, the benefits of a land and water management approach that respects Country, and greater recognition of the authority and role of traditional owners (Yarkuwa 2008). Their environmental–cultural management approach for Country connects with cultural continuity and community wellbeing. This includes the development of social, cultural and economic initiatives that build strength within the community. This broad agenda involves diverse activities such as:

- engaging in government processes and lobbying governments;
- engaging in research;
- holding positions on boards and reference groups;
- establishing partnerships with environmental, Indigenous, community and other groups;
- undertaking contracts and applying for grant monies;
- training and educating members; and
- local reconciliation activities.

This work takes place on Country and in meeting rooms, offices, and forums across Australia and internationally. It has seen alliances with environmental groups as part of the river red gum campaign, including field surveys to document environmental values (Yarkuwa et al. 2009). It has involved documenting Indigenous presence and activity through archaeological sites, drawing on David Crew's professional expertise. It extends to supporting language programs, and the continuance and revival of activities such as basket weaving. Yarkuwa member Debbie Flower continues her cultural connections in part through weaving fibres as her ancestors did, and diversifying this through introducing new mediums, as well as creating new figurative work representing local totems. She weaves using raffia, and started weaving during the

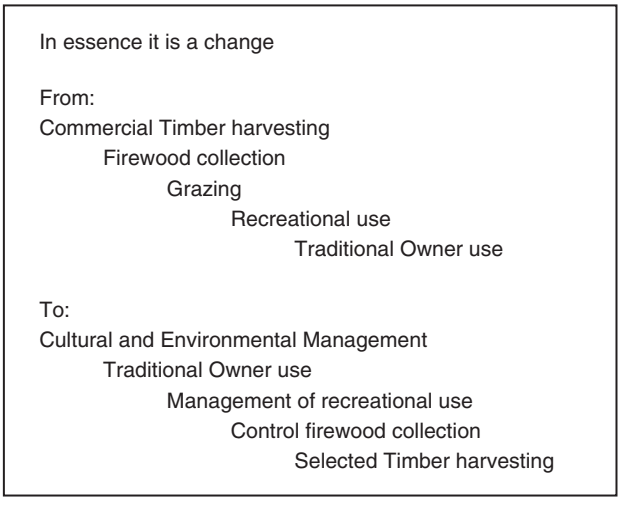
drought when the best wetlands that used to support the basket weaving grasses were parched of water. She held her first solo exhibition in 2012.

In recent times, much of this activity has focused on management issues for the Werai forest, but Yarkuwa are also active in other areas such as the North Deniliquin forest, the Island Sanctuary in Deniliquin, as well as water issues throughout the Edward/Kolety–Wakool river networks. We focus on how Yarkuwa addresses two challenges in their discursive work – the hyper-separation of nature and culture, and how this relates to the contested Indigenous presence. David Crew, co-author of this article and manager of Yarkuwa, discusses the context in which these issues are being raised:

> In more closely settled parts of Australia you've got many different land tenures, and diverse people that have emotional, economic and social connections. Where Indigenous perspectives have been marginalised or dismissed, their assertion can be confrontational (David Crew interview with J. Weir, 7 September 2011).

Yarkuwa must manage this confrontational aspect, whilst also asserting their understandings of how to live in Country, and their authority as traditional owners. One example of how they manage this is the diagrammatic translation tool they included in their submission to the river red gum investigation (Box 1; Yarkuwa 2009). Box 1 demonstrates their proposed management change by comparing the commercial timber harvesting approach with a cultural and environmental management approach. They use the language of contemporary environmental and resource management, reinserting their presence. It is familiar terminology and includes all current activities, just re-arranging the hierarchy of priorities – although this is also a rearrangement of who is in charge and who makes decisions. In the accompanying text Yarkuwa writes:

> It is our proposition that we [traditional owners] should be managing the Werai forest as a cultural and environmental location and that other uses can be undertaken under a controlled program that protects the cultural and environmental values of the forest (Yarkuwa 2009, p. 8).



Box 1. Werai forest proposed change of management. Source: Yarkuwa (2009, p. 8)

As Head and Gibson (2012, pp. 708–709, original emphasis) describe it, Yarkuwa are 'being *differently modern*': negotiating 'modern' concerns with 'pre-colonial priorities', so as to undertake restorative work that invests in ecological–cultural integrity. This is creative and productive work that they seek to do in partnership with the broader society, 'to work together to build a sustainable future for the forest, for the local economy and for the community' (Yarkuwa 2009, p. 7). Yarkuwa notes that this has not been possible to date because of:

> . . . the domination of the exploitative users to the exclusion of the values of traditional owners. While there has been an increase in the assessment of cultural values prior to logging activities these assessments are limited to those values protected by legislation. (Yarkuwa 2009, p. 7).

To address the exclusion of traditional owner values, Yarkuwa also became involved in a mapping project in 2009–2010, to spatially represent the activities of contemporary traditional owners on Country. This followed on from the river red gum investigation and informed the momentum for management change, although it was through their water reform work with the MDBA as well as the traditional owner alliance the Murray Lower Darling Rivers Indigenous Nations (MLDRIN; Weir & Ross 2007). Together with the Deniliquin Local Aboriginal Land Council, and in conjunction with MLDRIN, Yarkuwa participated in the MDBA's use-and-occupancy mapping project to document current Wamba Wamba and Perrepa Perrepa values for the Werai forest (Ward 2009). Use-and-occupancy mapping had been developed by First Nations peoples in Canada to demonstrate continual cultural use of traditional lands by current members of the community (Tobias 2009). One of the Yarkuwa goals was to provide data about Indigenous values broader than government policies restricted to the 'stones and bones' approach of cultural heritage. For the Werai forest map, almost 80 Wamba Wamba and Perrepa Perrepa traditional owners were interviewed, mapping on average approximately 120 sites each, with a total of over 12,000 sites identified. These sites included animal kill and collection sites, fixed cultural sites (for example, birth sites, burial sites, sacred areas), overnight sites, and plant and earth material collecting sites. In a way similar to the map of Nuu-chah-nulth culturally modified trees in British Columbia, the Wamba Wamba and Perrepa Perrepa established their presence in the forest by using the authority of maps in a fact generating exercise (Scott 1998; Braun 2002).

Yarkuwa's lobbying to return Werai to Indigenous ownership and authority has always occurred in tandem with lobbying to return variable water flows to the forests, because river regulation has had such a profound influence on the wetlands, rivers and creeks. In this work, Yarkuwa continue to express the relevance of their cultural–environmental agenda, for example in prioritising those wetlands where basket-weaving grasses grow. Yet, in the Murray-Darling Basin where the rivers are classified as 'over-allocated' for consumptive uses, and the water is severely degraded and of increasing economic value, influencing water law, policy and management has been a particularly fraught area for Indigenous people. The extended drought early in the twenty-first century, which increased public concern for the ecological health of the river forests and ecologies, also increased anxiety over the delivery of water for human use and consumption (Alston & Whittenbury 2011). In Yarkuwa's

submission on sustainable diversion limits in the Murray-Darling Basin, they criticised how debates about Indigenous water issues and rights had become narrowed to just a quantity of water positioned in competition with water available for agriculture:

> We are continually dismayed by the idea that there should be competition between consumptive [water] users and the environment when we seek to work together to Look after Country – a traditional Aboriginal value that is well recognised – Looking after Country means Country looks after you (Yarkuwa 2012a, p. 3).

It is an argument that resonates with the science and policy that connects river ecologies with river industries, to which traditional owners always also connect their river cultures. All people have culture embedded in the river ecologies. The traditional owners have a knowledge system that strongly articulates these relationships, and they keep pursuing the protection of these relationships. It is healthy Country that gives meaning and content to their rights and their authority. Without the life and activity supported by variable water flows, use-and-occupancy mapping becomes an exercise without content.

With the 2010 transfer of forest lands to the conservation estate, which included the reservation of Werai for Indigenous governance, it would seem likely that the local traditional owners will be in a position to formally implement their cultural–environmental management plan. The land transfers have become the subject of a Legislative Council inquiry into the management of public lands. This inquiry has become another forum for exploring understandings of fact and governance in relation to the management of the Werai forest. In the hearings in Deniliquin, there was discussion between the Council members and different people giving evidence about whether the forests were 'grown by the white man', as asserted in a number of public submissions (NSW Legislative Council 2012a, b). This question was put to several people, including Yarkuwa members Debbie Flower and manager David Crew, and was countered with evidence of scarred trees and with Indigenous oral history and ecological knowledge. Whilst it is beyond the scope of this article to examine the arguments behind this particular debate, what is interesting is how nature – something it is often assumed we can know objectively through the natural sciences – is very much contested. Establishing whose understanding of nature is right becomes central to establishing whose management priorities are legitimate, and is often framed as a battle between Indigenous and non-Indigenous people.

In the spring and summer of 2009–2010, heavy local and upstream rain fell and flowed down the rivers and creeks, flooding the wetland forests. After the long drought, the rains recharged nature and culture, and the traditional owners did not have to make a rights argument to return water to Country. The rains led to the recommencement of the water-sharing plan for the 2011–2012 irrigation season. This has been followed by an upturn in the economy, with a return to full water allocations and the reopening of the Deniliquin rice mill. The rains also provided opportunities for a planned environmental watering event in the Werai forest, which was monitored and assessed (Webster 2010). A number of recommendations for the future management of environmental water were made from this. However, Indigenous people were not involved, their sites and priorities were not monitored

and assessed, and their contribution was not part of informing the planned delivery of environmental water to the Edward/Kolety–Wakool river networks (as planned for in Hale & SKM 2011). The important work of environmental restoration occurs in places that have always been both natural and cultural, and we must find ways to ensure environmental and cultural issues are combined in information, policy and decision-making.

Conclusion

In this article we have shown how understandings about nature affect understandings of fact and governance concerning natural resource and environmental management, through the strategic work undertaken to challenge these assumptions by one Indigenous organisation in the Southern Riverina, NSW. We have revealed the meaning and intent behind their activity to unsettle understandings about what is and is not possible in natural resource and environmental management, so as to creatively generate more options for how to live with and within nature in Australia. We show how the problematic framing of nature only as wilderness, or environment only as resource, is addressed in the Indigenous philosophy of Country, an approach that places humans within their environments and reconnected with multiple other species and things. Country offers both challenges and insight for managers and governments tasked with environmental and resource decision-making in places that have always been natural and cultural. The challenge is to engage with both Indigenous and non-Indigenous knowledge practices so as to better acknowledge and support the depth and breadth of our relationships with local ecologies. The insight is provided by the clear articulation of an approach already doing this. We reveal how this is also part of the work of decolonising settler societies. The assertion of Indigenous authority is a contested space, as evident in the strategic approach that is taken by Yarkuwa, as well as the challenges of erasure that are persistently placed before them.

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Notes

1. This research was supported as an AIATSIS Council research project, and included funding for Yarkuwa to provide research assistance.
2. There are alternative spellings that are just as commonly used, including Wemba Wemba and Barapa Barapa.

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